

Peninsula Precinct, Springfield, Queensland (EPBC 2020/8629)

Preliminary Documentation Report

Prepared for Springfield City Group Pty Ltd
October 2026

Job 7399 E

Document Control

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Executive Summary

This Preliminary Documentation has been prepared on behalf of the proponent, Springfield City Group Pty Ltd, in direct response to additional information requested by the Commonwealth Department of Agriculture, Water and the Environment (DAWE), then**Department of Climate Change, Energy, the Environment and Water (DCCEEW)**, now **National Environmental Protection Agency (National EPA)** as part of the 'controlled action' assessment by 'preliminary documentation' for Peninsula Precinct, Springfield made on 7 October 2020 (EPBC 2020/8629).

The controlled action decision is based on DAWE's assessment of the project as potentially resulting in a Significant Impact on the following Matters of National Environmental Significance (MNES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act):

- Listed Threatened Species & Communities (Sections 18 & 18A) more specifically defined in the request for further information on the:
    - Koala (*Phascolarctos cinereus*) combined populations of Queensland, New South Wales and the Australian Capital Territory – Vulnerable
    - Grey-headed Flying-fox (*Pteropus poliocephalus*) – Vulnerable
- The department also considered there is a real chance of possibility of significant impacts to the following species:
    - Swift Parrot (*Lathamus discolor*) – Critically Endangered
    - Regent Honeyeater (*Anthochaera phrygia*) – Critically Endangered
    - White-throated Needletail (*Hirundapus caudacutus*) – Vulnerable and Migratory
- Following the Information Request, the DCCEEW also requested further information on the following species:
    - Greater Glider (*Petauroides volans*) – Vulnerable
    - Collared Delma (*Delma torquata*) – Vulnerable

Information provided within this report includes:

- A summary of the proposed development and a description of the assessment process;
- A description of the action including timeframes and staging;
- A description of MNES which may be affected by the proposal;
- Analysis of 'critical habitat' for the Koala, Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater and the quantification of impacts on the habitat of these species where required;
- Critical habitat and connectivity analysis for the Greater Glider to support an assessment of no residual significant impact on the species;

- Critical habitat analysis for the White-throated Needletail to support an assessment of no residual significant impact on the species;
- A discussion of empirical research about the impacts of development on MNES which may be affected by the proposal;
- Procedures to be implemented prior and during vegetation clearing and construction;
- Measures to avoid, minimise and mitigate potential impacts on MNES;
- Consideration of social and economic matters;
- Details of the proposed environmental offset for listed significant impacts, and
- A number of preliminary mitigation and management measures for protection of MNES.

A summary of comments and conclusions relating to the above MNES, impacts, proposed offsets and mitigation measures is provided below.

Koala (*Phascolarctos cinereus*)

At the time of the controlled action decision, the Koala was listed as a 'vulnerable' species under the EPBC Act. A significant proportion of Queensland's native vegetation, especially in South East Queensland, is identified under the *EPBC Act Referral Guidelines for the Vulnerable Koala* as 'critical habitat' for Koala due to the prevalence of recognised Koala food tree species across most landscapes. The Peninsula Precinct project area predominantly contains remnant native vegetation that includes species that are identified as Koala food and shelter trees. Initial field surveys did not observe Koalas within the referral area; however, subsequent contemporary surveys identified the species utilising the vegetation within and adjacent to the project area. The project will result in the removal and functional loss of 'critical habitat' for Koala that has the potential to have a 'significant impact' on the species based on utilisation of the site by Koalas and knowledge of their broader population dynamics.

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

The Grey-headed Flying-fox is listed as a 'vulnerable' species under the EPBC Act. It is considered highly mobile and able to utilise a wide range of floral food resources, including flowering eucalypts predominantly in the winter, across relatively expansive foraging areas. For this reason, it periodically displays overlap with Koala habitat in South East Queensland when foraging for eucalypt nectar, with suitable foraging habitat widespread in the greater Springfield and Greenbank region. The referral guidelines for Grey-headed Flying-fox focus on the assessment of potential impacts on roosting camps, with relatively minor provisions for the consideration of foraging habitat. The species was not recorded on the project area during initial field surveys, nor were roosting camps observed. However, contemporary field surveys and wildlife remotely piloted aircraft thermal surveys detected the presence of Grey-headed Flying-foxes within and surrounding the referral area. In addition, the presence of eucalypt dominated vegetation communities provides suitable foraging habitat for the species particularly during winter flowering events. Given the widespread distribution of the species across South East Queensland, the availability of habitat throughout the Springfield locality and temporal dynamic of the overlap with Koala habitat, potential impacts on the latter matter by default are presumed to be considered to significantly impact on the Grey-headed Flying-fox.

Swift Parrot (*Lathamus discolor*)

Under the EPBC Act, the Swift Parrot is listed as 'critically endangered.' An assessment of foraging habitat values within the referral area identified the presence of preferred foraging species listed under the *National Recovery Plan for the Swift Parrot* including *Corymbia citriodora* and *Eucalyptus tereticornis*. The proposal will result in the removal of preferred foraging species and as such, a significant residual impact is anticipated. A feature-based offset is proposed to compensate for the loss of 3,339 habitat features for the Swift Parrot.

Regent Honeyeater (*Anthochaera phrygia*)

Under the EPBC Act, the Regent Honeyeater is listed as 'critically endangered.' An assessment of foraging habitat values within the referral area identified the presence of preferred foraging species listed under the *National Recovery Plan for the Regent Honeyeater* including *Corymbia citriodora* and supporting species *Eucalyptus fibrosa*. The proposal will result in the removal of preferred foraging species and as such, a significant residual impact is anticipated. A feature-based offset is proposed to compensate for the loss of 2,756 habitat features for the Regent Honeyeater.

White-throated Needletail (*Hirundapus caudacutus*)

The White-throated Needletail is listed as 'vulnerable' under the EPBC Act. A review of the technical detail and published scientific literature for the White-throated Needletail, specifically relating to the abundance, distribution, ecology and habitat preference, and consideration of the scope of the proposed impact and off-site retention areas in the adjacent corridor that will remain into perpetuity and managed by Council, it is concluded that a significant residual impact on this species resulting from this development is considered unlikely.

Greater Glider (*Petauroides volans*)

At the time of the controlled action decision the Greater Glider was listed as a 'vulnerable' species under the EPBC Act. The Greater Glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forest and woodlands that feeds on eucalypt leaves and flowers. The species requires hollows for denning and prefers large hollows in large old growth trees. Critical habitat for the Greater Glider is considered to be large contiguous areas of eucalypt forest which contain mature hollow-bearing trees or fragmented habitat patches connected to larger patches of habitat that may facilitate dispersal of the species (DCCEEW, 2022). The Peninsula Precinct project area predominantly contains remnant native vegetation that includes a variety of eucalypt species. However, the site has been subject to disturbance in the form of fire, vehicle use and logging, leaving relatively few large and hollow-bearing trees within the impact site. The Peninsula Precinct is surrounded by modified areas including residential and commercial developments, main roads and a major train line. This infrastructure acts as significant movement barriers to the site from existing remnant vegetation to the south within White Rock Conservation Area and to the east within Greenbank Military Base, which are known Greater Glider habitat areas. Greater Glider were not identified within the referral area during targeted spotlighting and aerial wildlife surveys in September 2023, nor have they ever been recorded as part of pre- and post-clearance fauna surveys and reporting from the surrounding Springfield development area. It is considered highly unlikely the species occurs or would recolonise the area due to substantial surrounding fragmenting factors and it is concluded that a significant impact on the Greater Glider is unlikely.

Impacts

The Peninsula Precinct project area occupies a total land area of 18.90 ha and the entirety of this area is considered to contain 'critical habitat' for the Koala, Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater. The refined proposal area will result in the clearing of 18.90 ha containing critical habitat for the Koala, Grey-headed Flying-fox, Regent Honeyeater and Swift Parrot. The proposed action is unlikely to have a significant residual impact on the Greater Glider or White-throated Needletail.

Environmental Offsets

Environmental offsets for impacts to critical habitat will be resolved by providing an environmental offset on land external to the site via a third party offset provider. Environmental offsets have been calculated and will be delivered in accordance with the EPBC Act Environmental Offsets Policy. An Offset Management Plan has been developed for the proposed offset area which details existing values for Koala, Grey-headed Flying Fox, Swift Parrot and Regent Honeyeater, environmental outcomes and a management and monitoring program.

Management Plans & Mitigation Measures

Numerous management and mitigation measures and controls will be adopted as part of mandatory requirements conditioned by Ipswich City Council due to the site's location within the Springfield Structure Plan and best practice management adopted by **Springfield City Group**. This document includes a number of preliminary management measures relating specifically to Koala, Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater. The management measures remain preliminary to provide the National EPA with some certainty that potential impacts can be mitigated and managed. Vegetation, fauna, stormwater, erosion and sediment control issues will all be managed through a mandatory need to deliver management plans to Ipswich City Council for assessment, approval and implementation. It is noted that best practice controls proposed by Springfield City Group go above and beyond mandatory ICC standards.

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Attachment A8: Impact Area Raw Transect Data
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Attachment A10: Cultural Heritage Conservation Plan

Acronyms and Abbreviations

Legislation, Policies and Guidelines

EOP	EPBC Act environmental offsets policy (Cth)
EPBC	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
NCA	*Nature Conservation Act 1992* (Qld)
SPP	State Planning Policy (Qld)
SPRP	State Regulatory Planning Provisions (Qld)
VMA	*Vegetation Management Act 1999* (Qld)

Government Departments

DAWE	Department of Agriculture, Water and the Environment (Cth – former)
DCCEEW	Department of Climate Change, Energy, Environment and Water (Cth)
DAF	Department of Agriculture and Fisheries (Qld – former)
DES	Department of Environment and Science (Qld – former)
DETSI	Department of Environment, Tourism, Science and Innovation (Qld)
DPI	Department of Primary Industries (Qld)
DSDTI	Department of State Development, Tourism and Innovation (Qld)
EDQ	Economic Development Queensland (as part of DSDTI)
EHP	Former, Department of Environmental and Heritage Protection (Qld – former)
ICC	Ipswich City Council
DTMR	Department of Transport and Main Road (Qld)

General Terms

ACT	Australian Capital Territory
ADP	Area Development Plan
EDL	Ecologically Dominant Layer
ESCP	Erosion and Sediment Control Plan
ESD	Ecologically Sustainable Development
GHFF	Grey-headed Flying-fox
GHFF FHA	GHFF Foraging Habitat Assessment tool
KHAT	Koala Habitat Assessment Tool (as per the former Koala Referral Guidelines)
KSAT	Koala Spot Assessment Technique Survey
LAP	Local Area Plan
MEO	Montauban Environmental Offsets
MHQA	Modified Habitat Quality Assessment methodology
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NSW	New South Wales
OAG	Offsets Assessment Guide Calculator
OPW	Operational Works
PMST	Protected Matters Search Tool
QLD	Queensland

ROA	Rosevale Offset Area
RE	Regional Ecosystem
RMP	Rehabilitation Management Plan
SBMP	Site Based Management Plan
SEQERF	South East Queensland Ecological Restoration Guidelines
SHG	Saunders Havill Group
SMP	Stormwater Management Plan
SRRC	Scenic Rim Regional Council
SRI	Significant Residual Impact
SSP	Springfield Structure Plan
TEC	Threatened Ecological Community
VCFMP	Vegetation Clearing and Fauna Management Plan
WPMP	Wildlife Protection and Management Plan
WHIMP	Wildlife Habitat Impact Mitigation Plan
WWBW	Waterway for waterway barrier works

Reference Documents

Draft Code

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

EPBC Environmental Offsets Policy (EOP)

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

EPBC Offsets Assessment Guide (OAG)

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

FSRDM

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

Koala Referral Guidelines

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

SI Guidelines (SIG 1.1)

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

1. Introduction

Saunders Havill Group (SHG) act on behalf of **Springfield City Group Pty Ltd** 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 for the proposed Peninsula Precinct, Springfield (the project) (EPBC 2020/8629).

On the 14 May 2020 a referral under the EPBC Act was made to the Commonwealth **Department of Agriculture, Water and the Environment (DAWE)** for a controlled action assessment (refer **Attachment A1** for Controlled Action notice). On the 7 October 2020, this application was deemed a Controlled Action requiring assessment by "Preliminary Documentation."

The Controlled Action decision was based on the determination of potential impacts on Matters of National Environmental Significance (MNES) including:

- Listed threatened species and communities (sections 18 & 18A)
- Listed migratory species (sections 20 & 20A)

Listed threatened species and communities (sections 18 & 18A) and listed migratory species (sections 20 & 20A) protected under Part 3 of the EPBC Act that may or a likely to be significantly impacted include:

- Koala (*Phascolarctos cinereus*) combined populations of Qld, NSW and the ACT – Vulnerable
- Grey-headed Flying Fox (*Pteropus poliocephalus*) – Vulnerable
- Swift Parrot (*Lathamus discolor*) – Critically Endangered
- Regent Honeyeater (*Anthochaera phrygia*) – Critically Endangered
- White-throated Needletail (*Hirundapus caudacutus*) – Vulnerable and Migratory
- Greater Glider (*Petauroides volans*) – Vulnerable

It is acknowledged that the referral, which included an assessment of the project against the applicable EPBC Act guidelines and policies, including the *Significant Impact Guidelines 1.1*, nominated the project as 'a controlled action.'

Subsequent to the October 2020 controlled action determination, DAWE provided a list of additional information required to be addressed within the Preliminary Documentation Report. A copy of this PD additional information request is included as **Attachment A2** and each item has been extracted as each subsequent chapter of this PD. As part of this assessment process, the Preliminary Documentation must be published for public comment.

The purpose of this Preliminary Documentation Report is to provide additional information to DCCEEW to inform the Preliminary Documentation assessment process and ultimately obtain formal approval under the EPBC Act for the Peninsula Precinct, Springfield.

For readability of this document, the Referral Material and Technical Studies has been provided as **Attachment A3** of this document. The purpose of the PD and Referral Material are summarised below.

Preliminary Documentation refers to this document. This includes relevant figures, plans, tables and supporting material required to support full assessment of the action by DCCEEW. These have been referenced with the prefix A (*i.e.,* Figure A1, Table A1, Plan A1, Attachment A1). Figures, Plans and Tables are provided throughout the document in line with intext referencing, and Attachments are consolidated in **Section 11** for ease of reference. Refer to the table of contents (above) and list of attachments (refer **Section 11**) for further details.

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

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

Referral Material and Technical Documents refers to a copy of the referral material submitted for the controlled action assessment as well as any supporting studies and request for information responses, in full, prepared by technical consultants in preparation for this PD. This includes details of the land-based offset. It is noted that relevant sections from each of these documents have been brought forward and incorporated into the PD for ease of reference and readability. It is also noted that changes to the referral material are not possible, and the PD supersedes the information in the referral. The referral material is provided at **Attachment A3**.

Reference Table

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

Table A1: Reference Table

Item	Details	Section
2.0.	Description of the Action	2
3.0.	Description of the Environment and Matters of National Environmental Significance	3
4.0.	Quantification of Impacts	4
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Item	Details	Section
6.0.	Proposed Offsets	6
7.0.	Economic and Social Matters	7
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2. Description of the Action

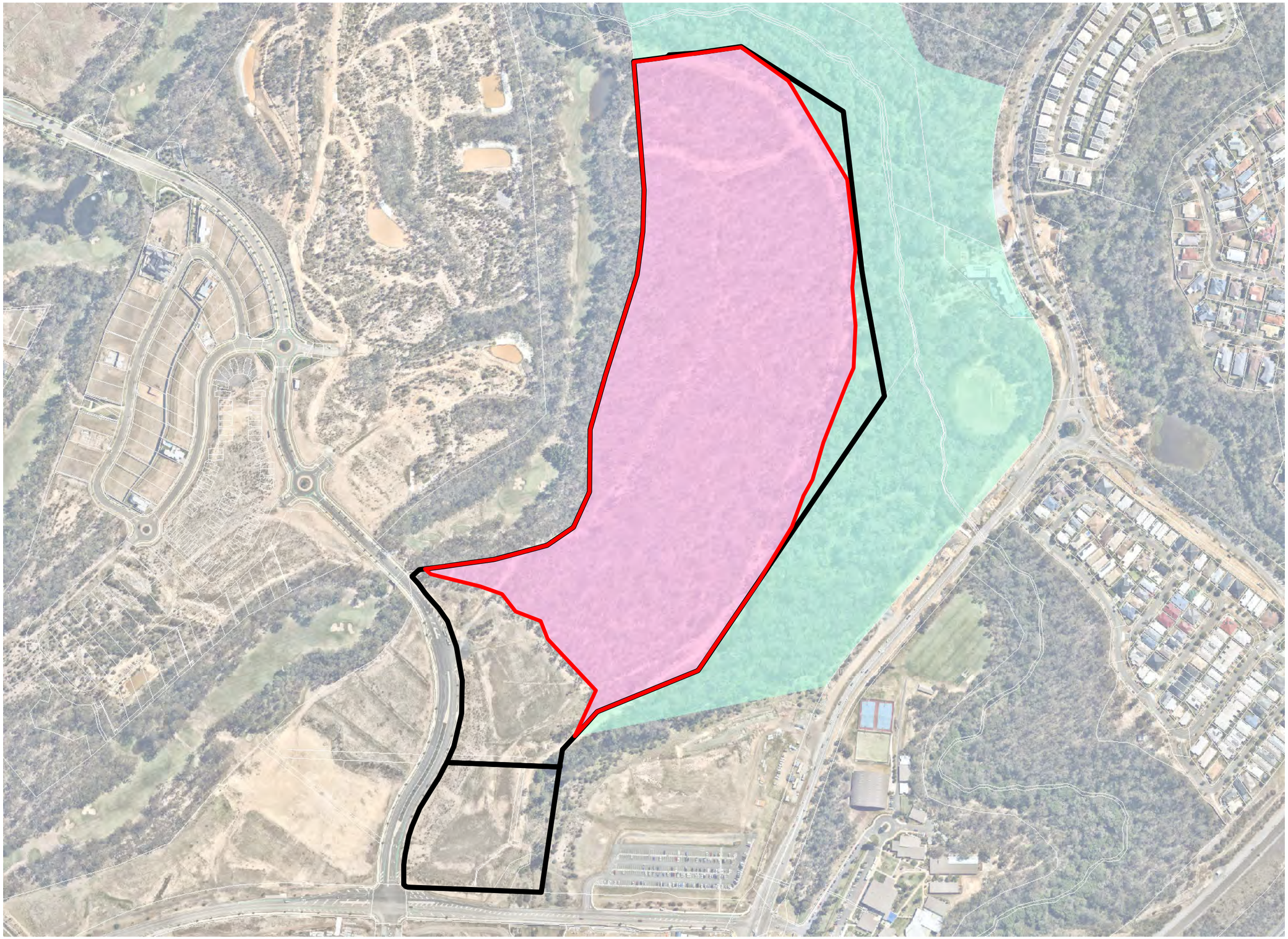
The following sub-sections respond to Item 2 of the PD request which requires the proponent to provide a description of the action.

A summary of the project attributes and relevant State and local environmental attributes is provided in **Table A2.**

Table A2: Property Summary

Address	7002 Brookwater Drive, Brookwater, Queensland
RPD	Lot 163 on SP303741
Area	18.90 ha
Protected Plants	Wholly within High Risk Area
Vegetation Management Act 1999	Category X Category B (Of Concern Composite RE RE12.9-10.2/RE12.9-10.7/RE12.9-10.19, RE12.3.11) Category C (Of Concern RE12.9-10.2, Of Concern RE12.3.11, Least Concern RE12.9-10.19) Watercourses and Essential Habitat for *Phascolarctos cinereus* (Koala), *Ninox strenua* (Powerful Owl) and *Coleus habrophyllus* and *Marsdenia coronata* (Slender Milkvine)
Fisheries Act 1994	Does not apply
MSES	MSES – Wildlife Habitat (endangered or vulnerable, special least concern, Koala habitat area – core), MSES – Regulated vegetation (Category B, Category C, essential habitat, intersecting a watercourse)
Koala Habitat	Koala habitat area (core)
LGA	Ipswich City Council (ICC)
Planning Scheme / Local Plan	Ipswich City Planning Scheme 2006 Springfield Structure Plan
Springfield Structure Plan (SSP)	Town Centre, Creek Line Open Space
Existing Land Use	Bushland
Proposed Land Use	Urban Development, refer master plan included as **Plan A1**.

A1. Proposed Development Masterplan



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 Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

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Legend

- Qld DCDB
- Site DCDB
- Referral Area [18.9 ha]
- Development footprint [18.9 ha]
- Opossum Creek Corridor exclusion zone

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 25 50 75 100 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:4,500 @ A3

saunders havill group

SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A1 Proposed Development Masterplan F

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

2.1 The location, boundaries and size of the impact

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

The following provides details on the impact area:

Table A3: Details on impact area

Address	7002 Brookwater Drive, Springfield, Queensland
RPD	Lot 163 on SP303741
Referral Area	18.90 ha
Impact Area	18.90 ha

Contextually, the site is located within Springfield, Ipswich and lies within the Springfield Structure Plan (SSP) area. The SSP sets out the broader planning framework for land within the structure plan boundary. The Peninsuala Precinct will be developed in accordance with the SSP. The SSP designate the land as community residential and open space.

The referral area is located in a landscape that has historically supported similar land uses; however, the landscape has rapidly evolved since the inception of the Springfield Master Plan area. Although the site retains native vegetation, the larger tract of vegetation in which the site forms part of has been subject to historic modification.

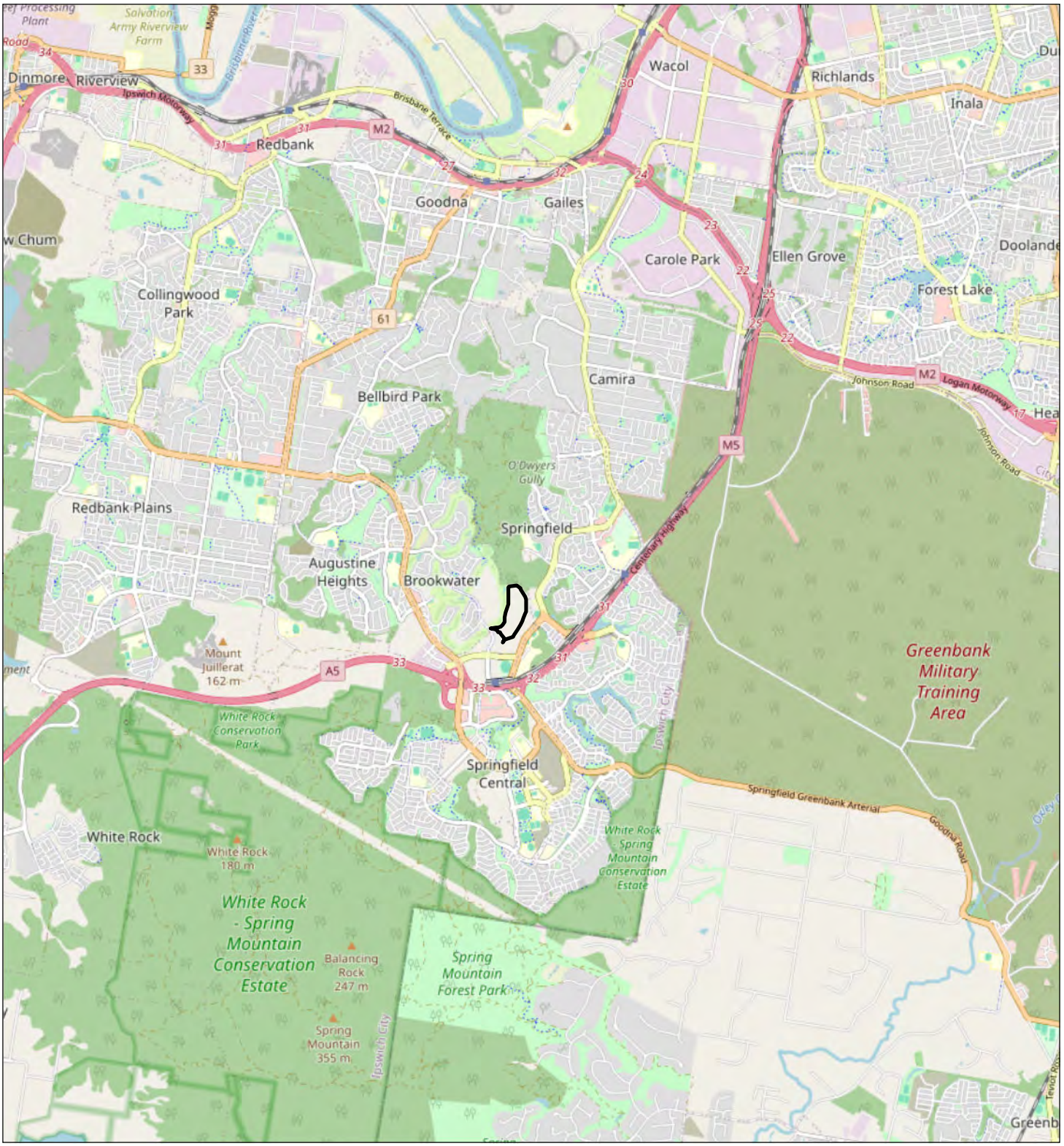
The site is located over one (1) land parcel described as Lot 163 on SP303741. The site context is displayed in **Figure A1** and site aerial in **Figure A2**. The site abuts Opossum Creek Parkland to the east, Brookwater Golf Course to the west, Opossum Creek to the north and Brookwater drive to the south-west. It is located approximately 650 m north of Springfield Central and 15.2 km south-east of Ipswich Town Centre. The site consists of remnant eucalypt woodland vegetation, mapped as Category B (remnant) under the *Vegetation Management Act 1999* (VMA). The surrounding landscape contains a matrix of mixed uses, including residential development, open space, infrastructure, community and commercial. North-east of the referral area within Lot 50 on SP242316 and Lot 51 on SP242316 is EPBC Referral 2020/8651 (Scenic Precinct). Refer to **Plan A2** for contiguous landscape analysis.

The project design has been guided by physical constraints and *in situ* ecological values informed by specialist consultant reports. The majority of the site is zoned as Springfield Town Centre with an area of Springfield Open Space along the eastern boundary. As such, the site design is considered to be aligned with on-ground values and the planning intent of the area (refer **Plan A1**). The proposed park and open

space area is located to provide a buffer to the adjoining Opossum Creek values adjoining the site to the north.

The proposed development footprint will necessitate the disturbance of approximately 18.9 hectares (ha) of vegetation. The proposed development will include a mixed precinct comprising:

- Town Business;
- Retail;
- Education; and
- Town Residential.



Legend

Referral Area

Figure A1

Site Context

Springfield City Group Pty Ltd

File ref. 7399 E Figure A1 Site Context F
Date *18/08/2026*
Project *Springfield Lakes Estate*

0 0.5 1 2 3 *km*

Scale (A4): 1:80,000 [GDA 1994 MGA Z56]

N

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Layer Source: *© State of Queensland 2021*



Legend

Qld DCDB

Referral Area

Figure A2

Site Aerial

Springfield City Group Pty Ltd

File ref. 7399 E Figure A2 Site Aerial F
Date *18/08/2026*
Project *Peninsula Precinct*

0 50 100 150 200 *m*

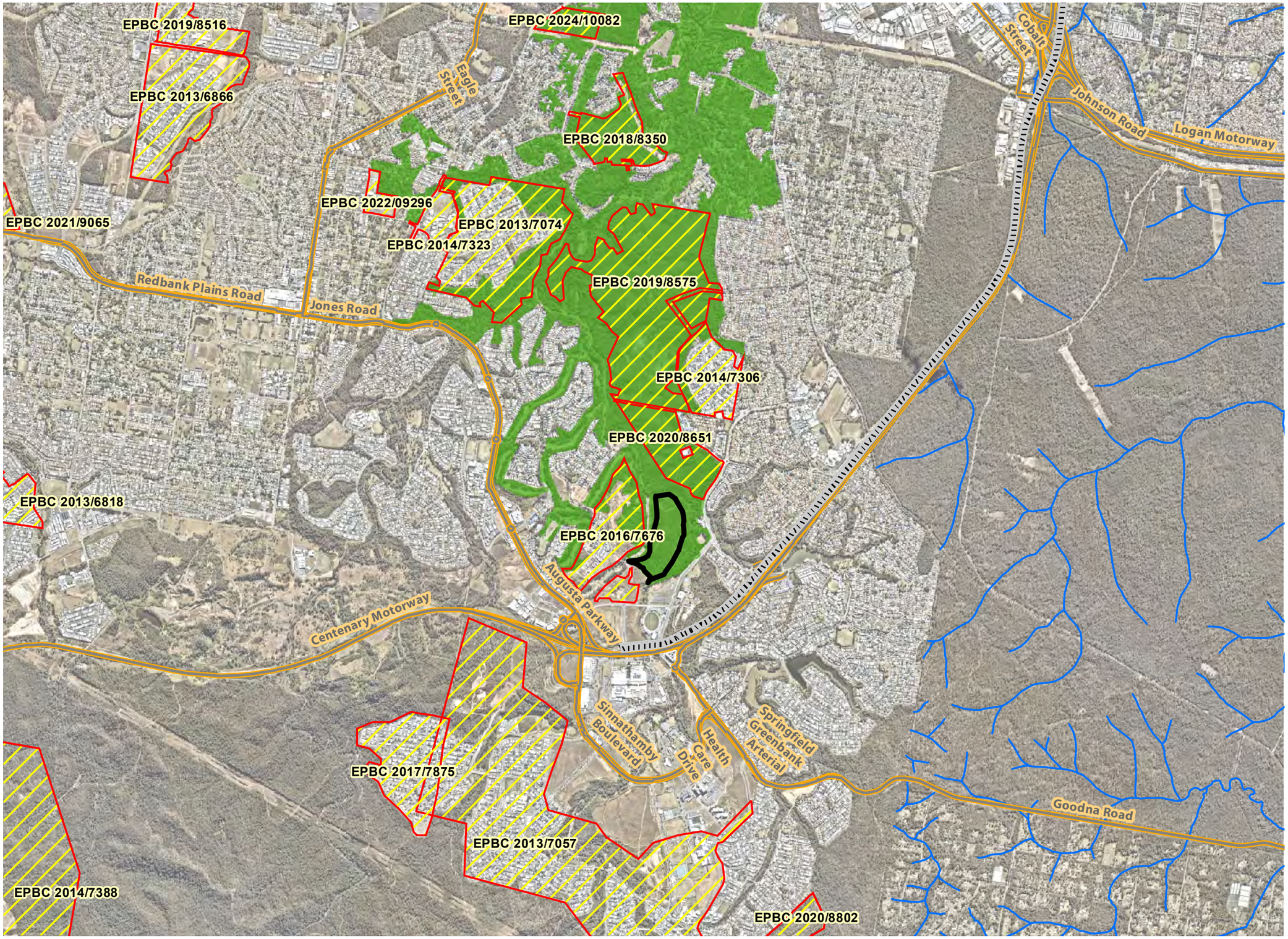
N

Scale (A4): 1:4,500 [GDA 1994 MGA Z56]

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A2. Contiguous Landscape Analysis



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Legend

- Referral Area
- Size of habitat area adjoining referral area - 878.4 ha
- Watercourse
- Surrounding EPBC Referrals
- Major and arterial roads
- Railway

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
E	18/08/2026	Amendments	TF	AW

0 250 500 750 1,000 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:35,000 @ A3

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SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A2 Contiguous Landscape Analysis F

2.2 Timeframes and staging

Item 2.1(b) of the PD Request asks for ***"a description of all components of action, including the anticipated timing and duration (including start and completion dates) of each component of the proposed action. This should include a detailed outline of the expected timing of any staged clearing over the construction period".***

The project was scheduled to commence in Q4 2026 and finished by Q1 2044, subject to receiving local approvals.

Due to the topography and necessary earthworks to balance the cut and fill across the site, clearing will be undertaken in one stage in a sequential manner under the direction of a Queensland Government endorsed Fauna Spotter Catcher.

Approvals with Ipswich City Council will be sought following EPBC Act approval. The local approval process was delayed due to uncertainties surrounding the timeframes under the EPBC Act approval process. The local approval process is described below.

The Springfield Structure Plan (SSP) identifies development areas and sectors, the high-level 'structure' and the Land Use Concept Master Plan. Approval of the Precinct Plan / Local Area Plan (LAP) is the first phase of local government approval through ICC as required under the SSP.

While the SSP provides the broadscale intended land use, this is further refined through the development and approval of an overarching Precinct Plan. The purpose of the Precinct Plan is to provide a thorough understanding and analysis of the site-specific characteristics and context, and the requirements of the SSP in order to demonstrate the preferred and practicable form of development.

Following approval of the ADP, the final stage of Council approvals is the Operational Works Plan. The operational works (OPW) approvals represent the final design and bulk earthworks outcomes approved by Council and typically occur as stages within the approved ADP. The extent of detail is wide ranging and includes, for example, where each street tree will be planted and the pavement type for footpaths. These ultimate design details directly inform the on-ground implementation and civil construction methodologies. An example of details typically included as part of OPW plans include:

- areas to be grassed,
- footpath alignments,
- locations for future plantings and
- flora species types.

2.3 Construction and operation

Item 2.1(c) of the PD Request asks for ***"a description of the construction and operation of the residential development and associated works (ie. activities that comprise its operation)".***

Item 2.1(d) of the PD Request asks for ***"An indicative layout plan for the proposed action area, including the location and type of land use, key infrastructure, and the number and location of dwellings, other buildings, open space, and conservation areas."***

The proposed action represents an important opportunity to establish a master-planned residential subdivision in the Ipswich City Council region in accordance with the Ipswich City Plan 2025.

Under the Ipswich City Plan, the site is zoned as Town Centre and Open Space. The proposed action is considered to meet the purpose of the local zone. Once completed, the project is expected to provide a mixed-used precinct. The reconfiguration of residential lots has been guided by site attributes (such as topography, vegetation, and location), discussion with Ipswich City Council during pre-lodgement meetings, applicable planning scheme requirements, and biodiversity and ecological considerations including *in situ* ecological values.

The proposed action activities will include clearing, earthworks to facilitate a mixed use precinct comprising town business, roads and infrastructure and/or town residential.

Presently, the referral area is exposed to constant urban and construction noise sources from major roads, surrounding schools and a combination of government-based projects and private area developments. Project design will facilitate all residential and vehicle access from the south to connect with existing roads. No collector roads are proposed to be constructed in an east-west direction with no transport impacts proposed to the creek corridor or the golf course. The project land holding is centrally located in the town centre and as a result will not disrupt any environmental connectivity to south, east or north.

The Opossum Creek corridor is identified as a local connectivity route which is limited in certain respects by the location of surrounding infrastructure. This includes the location of Springfield Parkway and Hymba Yumba Independent School to the east and Brookwater Golf Course to the west. The school facilities and sports fields are 80 m from the referral area boundary separated only by plantation timber rows of a former forestry operation. Opossum Creek environmental corridor exists as a 100 m wide retained vegetation area on land dedicated by the Springfield City Group as part of the broader environmental network for the city. Overarching planning for the region by ICC will enable the retention of this corridor in perpetuity allowing for continuous fauna movement and refuge as the region continues to develop. Lineal connectivity will be maintained throughout the creek corridor to the north and south via existing connections.

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

This section responds to Item 3 of the PD request which requires the proponent to provide a description of the environment affected by and surrounding the proposed action area, over both the short and long term. Specific matters this section address include, but are not limited to:

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

Item 3.1 of the PD Request asks for ***"a description of any potential matters of national environmental significance (MNES) (including but not limited to those listed above) that occur in the project area and adjacent areas".***

Appendix C of the referral (SHG, 2020) (included at **Attachment A3** of this PD) provides a Likelihood of Occurrence Assessment for MNES identified in the *EPBC Act* Protected Matters Search Tool as having the potential to occur within 5 km of the site. The search coordinates used to generate the Protected Matters Report are -27.6652, 152.9056

A refined version of the Likelihood of Occurrence Assessment has been completed and provided within this PD. The Likelihood of Occurrence Assessment utilising the assessment criteria provided in **Table A4** has been updated to include an updated list of relevant MNES incorporating contemporary database records and field survey data. Refer to **Table A5** for the refined assessment including the following MNES:

- Koala (*Phascolarctos cinereus*);
- Grey-headed Flying-fox (*Pteropus poliocephalus*);
- Regent Honeyeater *(Anthochaera phrygia)*;
- Swift Parrot *(Lathamus discolor)*;
- Greater Glider (*Petauroides volans*);
- Spotted-tailed Quoll (*Dasyurus maculatus maculatus*);
- White-throated Needletail (*Hirundapus caudacutus*);
- Collared Delma (*Delma torquata*);
- Lloyd's Olive (*Notelaea lloydii*);
- *Coleus habrophyllus (Plectranthus habrophyllus);* and

- Angle-stemmed Myrtle (*Gossia gonoclada*).

Marine / migratory species:

- *Monarcha trivirgatus* (Spectacled Monarch);
- *Monarcha melanopsis* (Black-faced Monarch);
- *Merops ornatus* (Rainbow Bee-eater); and
- *Rhipidura rufifrons* (Rufous Fantail).

Detailed surveys to determine presence of potential MNES have been completed in accordance with the relevant Commonwealth survey guidelines from 2020 to 2023, including but not limited to, targeted flora surveys, spotlighting and Unmanned Aerial Vehicle (UAV) drone surveys. The methodology and timing of these surveys is described in **Section 3.4**.

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

Table A4: Likelihood of Occurrence Assessment Criteria

Likelihood of occurrence	Assessment criteria[1]
Unlikely	The investigation area does not contain habitat types or resources known to be utilised by the species during any stage of its lifecycle. OR No contemporary[2] species records within 5 km of the investigation area and at least one of the following criteria is met: • The investigation area is beyond the known geographic range of the species; OR • The investigation area does not contain habitat types or resources known to be utilised by that species during any stage of its lifecycle ; OR • The investigation area and/or surrounding land is highly disturbed[3].
Low	There are contemporary species records more than 1 km but less than 5 km of the investigation area, and it contains habitat types or resources known to be utilised by the species. OR There are contemporary species records more than 5 km but within 20 km of the investigation area and the following criteria are met:

[1] Criteria should be used as a guide only. Site- and species-specific factors should be considered by the assessment.
[2] Within 20 years of the date of the assessment.
[3] Contains minimal vegetation cover with a dominant land use such as development, extractive industries, intensive agriculture

Likelihood of occurrence	Assessment criteria[1]
	• The investigation area contains habitat types or resources known to be utilised by the species; AND • No major barriers to dispersal[4] for the species exist between the location of the record and the investigation area; AND • The investigation area and/or surrounding land is relatively undisturbed and there is potential for individuals of the species to survive in the short-term.
Moderate	There are contemporary species records within 1 km of the investigation area and it contains habitat types or resources known to be utilised by the species. OR There are contemporary species records within 5 km of the investigation area and the following criteria are met: • The investigation area contains habitat types or resources known to be utilised by the species; AND • No major barriers to dispersal for the species between the location of the record and the investigation area; AND • The investigation area and/or surrounding land is relatively undisturbed and there is potential for individuals of the species to survive in the short-term.
High	There are contemporary species records within 1 km of the investigation area and the following criteria are met: • The investigation area contains habitat types or resources known to be utilised by the species; AND • No major barriers to dispersal for the species between the location of the record and the investigation area; AND • The investigation area and/or surrounding land is relatively undisturbed and there is potential for individuals of the species to survive in the short-term.
Known	Species positively identified during field surveys within the investigation area OR there are multiple contemporary species records within the investigation area.

[4] Barriers to dispersal will be species specific, but for tree or ground dwelling fauna may include major roads with no fauna crossing features or dense development.

Table A5: Extract of likelihood of Occurrence Assessment for relevant MNES from Attachment A3 – Appendix B of PD.

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
Phascolarctos cinereus	Koala	Vulnerable	Vulnerable	The Koala is endemic to Australia and is widespread in coastal and inland areas from north-east Queensland to Eyre Peninsula, SA, (SEWPAC, 2012d). Koalas inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus spp. (SEWPAC, 2012d). The Koala is a leaf-eating specialist. Its diet is restricted mainly to foliage of Eucalyptus spp. It may also consume foliage of related genera, including Corymbia spp., Angophora spp. and Lophostemon spp. and at times supplement its diet with other species, including Leptospermum spp. and Melaleuca spp. (SEWPAC, 2012d).	Koalas are known to occur within the proposed action site and adjacent to within creeklines corridors due to the dominance of eucalypt woodland. The presence of koala has been confirmed through multiple means including ecological field surveys, drone surveys and public database records. A more detailed assessment of surveys and technical information is provided in **Section 3.3.4**. **This species was assigned a likelihood of occurrence of 'known' as it has been observed in the area and adjacent to the site.**
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable	The Grey-headed Flying-fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feeds in introduced tree species in urban areas and in commercial fruit crops. The primary food source is blossom from Eucalyptus and related genera, and in some areas it also utilises a wide range of rainforest fruits. None of the vegetation communities used by the Grey-headed Flying-fox produces continuous foraging resources all-year round, and the species has adopted complex migration traits in response to seasonal food availability (SEWPAC, 2012g). The Grey-headed Flying-fox roosts in aggregations of various sizes on exposed branches, commonly of emergent trees. Roost sites are typically located near water, such as	No camps or evidence of foraging was observed within the project area; however, food resources and foraging habitat occur within the referral area. Although not observed on-site during the initial survey period, more contemporary surveys identified several Grey-headed Flying-foxes within the referral area and surrounding Opossum Creek. However, no roosts were observed within or adjacent to the referral area. A total of 11 known active roosts (active within the latest monitoring period) are present within a 20 km radius of the site which includes: ▪ Nationally Important Mount Ommaney, Westlake Drive (400) ▪ Camira, Barbara Street (140) ▪ Camira, Stephen Cook Memorial Park (1269) ▪ Bundamba, Paice Street (574)

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
				lakes, rivers or the coast. Roost vegetation includes rainforest patches, stands of Melaleuca, mangroves and riparian vegetation, however colonies also use highly modified vegetation in urban and suburban areas. The species can maintain fidelity to roost sites for extended periods, although new sites have been colonised in recent times (SEWPAC, 2012g). Distribution: Queensland: Black Swamp, Caboolture (Wararba Creek), Camira, Canungra (Gold Coast), Cascade Gardens (Gold Coast), Curlew Park (Sandgate), Dayboro (Strong Road), Eerwahvale, Esk, Giffin Park (Norman Creek), Goat Island (Noosaville), Gympie, Helensvale (Gold Coast), Hervey Bay, Indooroopilly, Kandanga, Kinmong Creek, Lytton Road, Meakin Park, Parklands, Peachester, Samford (Days Road) Sandstone Point, Sparkes Hill, State Forest 38, Stradbroke Island, Tallebudgera, Upper Rocky Creek/Murphys Creek, Victoria Point (Egret Drive), Woodend and Woodford (SEWPAC, 2012g).	▪ Parkinson, Avondale Crescent (419) ▪ Goleby Avenue, Queens Park (595) ▪ Yamanto (479) ▪ Woodend (191) ▪ Beryl Roberts Park, Coopers Plains (745) ▪ Sunnybank, Les Atkinson Park (452) ▪ Warana Court, Boronia Heights (848) The closest GHFF camps to the project area are not of national significance and exist approximately 3.6 km to the north-east, approximately 6.3 km to the north-west, approximately 8.9 km to the north-west and 12.5 km to the east, and approximately 5.5 km to the east of the project area (Camira, Barbara Street (140), Redbank – Pan Pacific Peace Garden (428), Bundamba, Paice St (574) and Parkinson, Avondale Crescent (419), respectively). One (1) nationally significant Flying-fox camp is located 12.5 km north of the site being Mount Ommaney – Westlake Drive (400). It is noted the Flinders-Karawatha Bioregional Corridor which constitutes >20,000 ha of continuous remnant vegetation is located approximately 1.4 km east of the site and forms critical foraging habitat for the species. GHFFs were observed foraging on the site during 2023 nocturnal surveys. A more detailed assessment of surveys and technical information is provided in **Section 3.3.5.** **This species was assigned a likelihood of occurrence of 'known.'**

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
Petauroides volans (NCA listed Petauroides armillatus)	Greater Glider	Vulnerable	Vulnerable	The Greater Glider is an arboreal nocturnal marsupial that 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. Diet consists of eucalypt leaves, and occasionally flowers. Small home ranges and low dispersability make this species sensitive to clearing and fragmentation, with low persistence in small forest fragments.	There is a high level of surrounding fragmentation and lack of connecting habitat to contiguous vegetation areas affecting the overall suitability of the site to support Greater Glider. The referral area is surrounded by recently developed areas within the suburbs of Bellbird Park, Brookwater and Springfield. Connecting habitat is limited to lineal strips of vegetation provide limited potential for consistent population-level connectivity. Additionally, significant linear infrastructure including the Centenary Highway and adjoining rail easement represent a significant barrier for movement between the potential habitat areas within the referral area and contiguous habitat areas to the east and south-west where required gliding distances on either side of the barriers regularly exceed 100 m. The absence of a Greater Glider population within the proposed action site and broader habitat patch is corroborated through the presence of records of the species within a 5 km radius of the site being limited to White Rock Conservation Park located approximately 3.5 km to the south-west and Greenbank Military Training Area located approximately 2 km to the east. Additionally, targeted spotlighting and drone surveys completed within the referral area and broader patch have not detected the species. It is noted that one (1) ALA record dated August 2023 is located within an active construction zone adjacent to the broader vegetation patch to the south. The validity of the record was queried with ALA and iNaturalist who confirmed the original coordinate was obfuscated due to its sensitive nature. The publicly available positional accuracy was increased to a 0.2 x 0.2 degree cell (29 km area) and the coordinate is replaced with a random point within that cell. The ungeneralised coordinate was provided which confirmed its location within White Rock

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
					Conservation Park. The closest verifiable record is 3 km east of the site within the contiguous vegetation areas of Greenbank Military Training Area. However, this record is separated by significant expanses of urban development with limited connecting vegetation. In this case, while the record is within a 5 km radius of the site, the high level of fragmentation substantially reduces the ability of the species to access the site. A more detailed review of greater glider likelihood of occurrence incorporating site habitat attributes and landscape connectivity assessment is provided in **Section 3.3.6.** **This species was assigned a likelihood of occurrence of 'low.'**
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Critically Endangered	Regent Honeyeaters mostly occur in dry Box-Ironbark Eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief, wherein they prefer moister, more fertile sites. These areas are generally associated with creek flats and river valleys and foothills. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. They are a generalist forager, which mainly feed on nectar from a wide range of eucalypts and mistletoes, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include *Eucalyptus sideroxylon* (Mugga Ironbark), *E. melliodora* (Yellow Box), *E. albens* (White Box), *E. robusta* (Swamp Mahogany), *Corymbia maculata* (Spotted Gum) or *C. citriodora* (Spotted Gum). *Corymbia citriodora* is known as the Queensland variety of Spotted Gum.	Potential foraging habitat for the Regent Honeyeater occurs on and adjacent to the subject site. The project area is dominated by *Corymbia citriodora* (Spotted Gum) with other winter flowering eucalypt species also present. It is noted that Regent Honeyeaters prefer large, old growth eucalypts as they are more productive nectar sources, however, large diameter old growth trees were sparsely observed throughout the referral area, likely a result of historical disturbances such as logging and fire. While the site contains potential foraging habitat for the species, it is considered more likely that the species would utilise the vast areas of protected and higher quality habitats available in the nearby vicinity of the site. The Greenbank Military Base is located approximately 2 km east of the site and White Rock Conservation Park located within the Flinders-Karawatha Bioregional Corridor which constitutes >20,000 ha

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
					of continuous remnant vegetation is located approximately 3.5 km south of the site. The Regent Honeyeater was recorded in 2019 approximately 1 km south-east of the site in the Springfield Lakes area, therefore is identified as having potential to occur on-site. A more detailed assessment of surveys and technical information is provided in **Section 3.3.2**. **Due to the presence of potential foraging habitat on-site and recent records of the species in the locality, this species was assigned a likelihood of occurrence of 'moderate.'**
Lathamus discolor	Swift Parrot	Critically Endangered	Endangered	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. They are known to prefer *Corymbia citriodora* (Spotted Gum) as a primary feed species in Queensland among other species such as *Eucalyptus robusta* (Swamp Mahogany), *E. tereticornis* (Forest Red Gum), *E. sideroxylon* (Mugga Ironbark), *E. albens* (White Box) and *E. macrocarpa* (Grey Box).	Potential foraging habitat for the Swift Parrot occurs on and adjacent to the subject site. The project area is dominated by *Corymbia citriodora* (Spotted Gum) which is identified as a primary foraging species for the Swift Parrot in Queensland. The Opossum Creek corridor, outside of the project area, contains a higher abundance and diversity of suitable foraging species such as *E. tereticornis* (Forest Red Gum) than the referral area. While the site contains potential foraging habitat for the species, it is considered more likely that Swift Parrot would utilise the vast areas of protected and higher quality habitats available in the nearby vicinity of the site. The Greenbank Military Base is located approximately 2 km east of the site and White Rock Conservation Park located within the Flinders-Karawatha Bioregional Corridor which constitutes >20,000 ha of continuous remnant vegetation is located approximately 3.5 km south of the site.

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
					The Swift Parrot has been recorded in the broader locality within the Springfield Lakes area in 2019 and in Kingston in 2014, therefore is considered to have potential to occur on-site. A more detailed assessment of surveys and technical information is provided in **Section 3.3.1**. **Due to the presence of potential foraging habitat on-site and recent records of the species in the locality, this species was assigned a likelihood of occurrence of 'moderate.'**
Hirundapus caudacutus	White-throated Needletail	Vulnerable	Vulnerable	The White-throated Needletail is predominantly an aerial species and occurs over most types of habitat. They are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps.	The site contains suitable foraging habitat for the White-throated Needletail. The Flinders-Karawatha Bioregional Corridor which constitutes >20,000 ha of continuous remnant vegetation is located approximately 2 km east of the site and forms critical foraging habitat for the species. WildNet records indicate the species has previously been recorded on the site, however, this record was in the year 1990. Targeted bird surveys were conducted in January 2021 to detect the White-throated Needletail. A flock of swifts were observed over the site during the surveys, however, due to the erratic flight patterns and high altitude, they were not able to be positively identified as White-throated Needletail. A more detailed assessment of surveys and technical information is provided in **Section 3.3.3**.

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
					Due to the presence of potential foraging and roosting habitat on-site and presence of a historical record, this species was assigned a likelihood of occurrence of 'moderate.'
Coleus habrophyllus *(*syn. *Plectranthus habrophyllus***)**	-	Endangered	Endangered	Specimens of *Coleus habrophyllus* have been recorded growing on chert or sandstone outcrops, in open woodlands often in shaded situations near vine forest. Seven populations are known including: Oxley Creek, Greenbank; Opposum Creek, Springfield; Woogaroo Creek, Goodna; three populations within White Rock Conservation Park, incorporating Six Mile Creek Conservation Park near Ormeau (south of Beenleigh).	This species has niche habitat requirements including rocky outcrops with limited to no weeds and a relatively undisturbed understorey and shaded location. The population situated on Mountain Creek to the south of the referral area is located on a rocky outcrop facing south-east and contains limited to no weed incursion. Field surveys identified potentially suitable microhabitat in the form of rocky outcrop north-east of the referral area. The area was largely free of weeds and is located on a south-south-east facing slope, both of which are suitable habitat niches for *Coleus habrophyllus*. Following the identification of this suitable habitat adjoining the referral area, targeted searches of the area for the species were undertaken, however, only the common *C. australis* (syn. *Plectranthus parviflorus*) was identified. An area of *C. habrophyllus* are present north-west of the referral area within Opossum Creek which are adequately separated from development impacts. As *C. habrophyllus* was not identified within the referral area during the extensive targeted surveys of the potential habitat, the species is not considered to be present within the project area. **This species was assigned a likelihood of occurrence of 'low' based on the absence of the species from the site despite the identification of potential microhabitat.**

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
Dasyurus maclatus maculatus	Spotted-tailed Quoll (SE mainland population)	Endangered	Endangered	The Spotted-tailed Quoll occurs in eucalypt forest and woodland and requires the presence of suitable denning habitat for shelter and breeding requirements which may include hollow logs, tree hollows, rock outcrops or caves. This species is predominantly found in unlogged forest or forest that has been minimally disturbed due to wide breeding ranges and. This species is predominantly nocturnal and species rests during the day in dens. Individuals require an abundance of food such as birds and small mammals, and large areas of relatively intact vegetation through which to forage. Latrines of the Spot-tailed Quoll are sites where groups of individuals repeatedly urinate and defecate over long periods of time, resulting in the bleaching of the soil substrate and an accumulation of scats. For a highly cryptic species such as the Spot-tailed Quoll, these sites provide focal points for studies into distribution, diet, habitat, population structure, and management. Latrines are typically found in rocky creek beds, at the bases of cliffs, and on roads. The mean home range for males is 992 ± 276 ha, and 244 ± 72 ha for females.	Field surveys confirmed the limited availability of potential denning sites such as rock outcrops, hollow logs or caves throughout the referral area. The site is unlikely to provide ideal breeding and foraging habitat due to the lack of suitable den sites. Preferred habitats in the locality are associated with the Greenbank Military Training area located 2 km east of the site, and the White Rock Conservation Park within the Flinders-Karawatha Bioregional Corridor located approximately 3.5 km south of the site. Historical records are generally contained within these habitat reserves. The placement of the site in an urban context indicates higher potential for increased threat from predators such as wild dogs and red foxes. It is noted that predation from red foxes, wild dogs and domestic dogs are primary threats to quolls, and evidence of wild or domestic dogs and foxes in particular have been observed on and adjoining the site. Review of ALA records indicates the presence of one (1) record from 2004 located approximately 4.6 km north-east of the site at the intersection of the Logan Motorway and Centenary Highway in Carole Park. The record is located within the Greenbank Military Training Area. Records of the Spotted-tailed Quoll are predominantly several kilometres south-east of the site within the Logan locality. **Due to the lack of suitable denning habitat, the high potential for threats and the presence of preferred and contiguous habitats in the locality of the site, it is considered 'unlikely' that the Spotted-tailed Quoll would occur on-site.**
Delma torquata	Collared Delma	Vulnerable	Vulnerable	The Collared Delma occurs on rocky hillsides on basalt and lateritic soils supporting open eucalypt and Acacia	The Collared Delma was considered as part of the broader likelihood of occurrence assessment undertaken as part of the

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
				woodland with a sparse understorey of shrubs and tussocks or semi-evergreen vine thicket. They rely on specific microhabitats—scattered rocks (10–30 cm), leaf litter, and native grasses.	referral. Broad vegetation types suitable to support the Collared Delma including open eucalypt woodland occurs within the action area with scattered areas of potential microhabitat. Within the Ipswich region, there is one ALA/iNaturalist record of the species (dated 2023) present within the White Rock Conservation Park, south-west of the project area, however, is noted to be an obfuscated record with a spatial uncertainty of 29.7 km with the grid overlapping parts of Ipswich, Logan and Brisbane city suburbs. Historical surveys for the collared delma conducted by ecological consultant groups adjoining the referral area and Greater Springfield have noted lower quality habitats and no evidence of presence. The action area has been subject to historical fire disturbance with subsequent fragmentation occurring around the site associated with development. **A review of records, survey data and disturbance suggest a low likelihood that the species is present within the action area. For greater confirmation, further assessment is provided in Sections 3.3.7 and 4.10.**
Notelaea lloydii	Lloyd's Olive	Vulnerable	Vulnerable	*Notelaea lloydii* is endemic to south-east Queensland between Mt Brisbane, near Somerset Dam, to just south of Beaudesert and as far west as Mt Berryman near Laidley, a range of approximately 120 km. The species occurs on undulating to hilly terrain either in moist gullies or on gentle to steep dry slopes, but is rarely found on rocky outcrops. Soil types are mostly shallow, well drained and stony to very rocky in texture. Found in the	Field survey confirms there is some potential habitat on-site in the form of mature eucalypt woodland on gentle slopes, however, preferred ecotonal and moist habitats are lacking. More suitable habitat is considered to occur within the Opossum Creek corridor to the west of the site. Field surveys on-site and in the adjoining creek corridor did not detect the species.

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
				ecotone between eucalypt open forests and vine thickets at 80-480 m above sea level (asl).	In addition, a review of ALA records indicate there are no records of the species within 5 km of the site. **It is considered that the species is 'unlikely' to occur on-site.**
Gossia gonoclada	Angle-stemmed myrtle	Endangered		*Gossia gonoclada* typically occurs along riverine environments. The species prefers to grow is lowland remnant riparian rainforest and notophyll vine forest in subtropical South-east Queensland. Some have been recorded in the ecotone areas between vine forest and rainforest vegetation and that of eucalypts. The DCCEEW conservation advice states that the angle-stemmed myrtle is endemic to south-east Queensland along the lower reaches of the Brisbane and Logan rivers. The species formerly occurred around Moggill and New Farm in Brisbane but there have been no recent discoveries in these areas. There are currently eight known populations with 72 individual wild plants within these. The species occurs or may occur in the following mapped Regional Ecosystems in south-east Queensland; 12.1.1, 12.1.3, 12.3.1, 12.3.7, 12.3.7a, 12.3.11, 12.3.11a, 12.5.13a, 12.11.10, 12.11.3 and 12.11.3a (Queensland Herbarium 2015).	*Gossia gonoclada* has been confirmed to occur proximal to the proposed action site within rainforest habitat areas associated with Opossum Creek and Woogaroo Creek. Four (4) angle-stemmed myrtle individuals were recorded by the University of Queensland in 2020 and 2021 as part of Myrtle rust surveys of Eastern Australia (Fensham *et al*., 2021). The records were located along Opossum Creek and Woogaroo Creek within rainforest dominated vegetation, located outside the referral area and adjoining vegetation retention areas proposed as part of the action. One (1) record from the study located along Opossum Creek and dated July 2020 is published on ALA. This species is addressed in further detail in **Section 3.2.5.1.** **While the species was confirmed to occur adjacent to the site, due to the absence of suitable rainforest habitat types within the referral area there is considered a low likelihood that the species would occur within the referral area.**

Marine / Migratory Species

These species are highly mobile, migratory or nomadic woodland and forest birds that utilise a broad range of habitats across eastern Australia. While they may occur within the wider region on a seasonal or transient basis, the site is not considered to provide important habitat such as known breeding areas or regionally significant foraging resources. In accordance with the Significant Impact Guidelines, an action is likely to have a significant impact on a listed marine species if it substantially modifies, destroys or isolates important habitat, or disrupts ecologically significant populations. Given the small scale and localised nature of disturbance, any individuals present would be able to readily disperse into the retained Opossum Creek corridor and broader conservation areas in the surrounding locality.

Species	Common Name	EPBC Status	NCA Status	Habitat (foraging and resting) Preferences, Breeding/nesting and Seasonal Influences	Likelihood of Occurrence
Monarcha trivirgatus	Spectacled Monarch	Marine, Migratory (Bonn Convention)	-	The Spectacled Monarch's natural habitats are subtropical or tropical moist lowland forests, subtropical or tropical mangrove forests, and subtropical or tropical moist montane forests. Its preference is for thick understorey areas.	The species' primary habitat is comprised of tropical moist lowland forests, subtropical or tropical mangrove forests and subtropical or tropical moist montane forests. The referral area is predominantly comprised of dry sclerophyll forest. Suitable habitat to support the species was not identified within or adjoining the referral area. The species is considered unlikely to occur.
Monarcha melanopsis	Black-faced Monarch	Marine, Migratory (Bonn Convention)	-	The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine thickets, complex notophyll vine forests, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and occasionally cool temperate rainforest.	The referral area is predominantly comprised of dry sclerophyll forest therefore suitable habitat to support the species was not identified within or adjoining the referral area. The species is considered unlikely to occur.
Merops ornatus	Rainbow Bee-eater	Marine	-	The Rainbow Bee-eater occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation.	The Rainbow Bee-eater was identified as part of ecological surveys and was detailed in the referral. While the Rainbow Bee-eater is listed as a marine species and is a relatively widespread and common species in Queensland. As the marine environment is not a controlling provision for this project it does not warrant further assessment under the EPBC Act.
Rhipidura rufifrons	Rufous Fantail	Marine	-	The rufous fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by Eucalypts such as *Eucalyptus microcorys, Eucalyptus pilularis, Eucalyptus resinifera* and a number of other Eucalyptus species.	The rufous fantail is known to occur and forage within the proposed action site particularly within adjoining major gully lines and rainforest vegetation areas. The species has been observed on multiple occasions through ecological field surveys and is considered relatively common in the surrounding landscape and locality. As the marine environment is not a controlling provision for this project it does not warrant further assessment under the EPBC Act.

3.2 Description of the current land use and natural environment

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

The following subsections provide information of the current land use and environmental features recorded and assessed during the field survey period.

3.2.1 Current land use

A review of historical aerial imagery and ground-truthing assessments indicates that the property was historically utilised as part of the broader forestry practices throughout the Springfield area, including logging and the creation of *Eucalyptus grandis* plantations. Since 1980 it has remained in a relatively natural state except for minor clearing to establish vehicle access tracks.

3.2.2 Topography

Elevation across the site ranges from 40 m above sea level (ASL) where the site slopes towards Opossum Creek up to 100 m ASL in the northern portion of the site. The site generally slopes towards the south and west (refer **Figure A3**).

3.2.3 Waterways and waterbodies

No mapped waterways under the Queensland *Fisheries Act 1994* or watercourses under the VMA are mapped within the project area. Opossum Creek occurs north-east of the referral area. It mapped as a 'major risk' waterway for waterway barrier works (WWBW) under the *Fisheries Act 1994* and Stream Order 4 watercourse under the VMA. A tributary of Opossum Creek also meanders downstream to the east of the referral area which is mapped as a 'high risk' WWBW and Stream Order 3 watercourse (refer **Figure A3**).

3.2.4 Vegetation Communities

The EPBC Act Online Protected Matters Search Tool (PMST) lists six (6) Threatened Ecological Communities (TECs) as likely to occur within the area and within 5 km of the site:

- The Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community occurs in coastal catchments, mostly at elevations of less than 20 m above sea level that are typically found within 30 km of the coast, however, distance can vary by catchment. The canopy layer is dominated by *Casuarina glauca* (Swamp Oak) and in Queensland is represented by Regional Ecosystem (RE) 12.1.1 or 12.3.20. Neither *Casuarina glauca* (Swamp Oak) nor RE12.1.1 or 12.3.20 were identified on-site, and therefore the TEC is not present.
- The Lowland Rainforest of Subtropical Australia has typically relatively low abundance of species from the genera *Eucalyptus, Melaleuca* and *Casuarina*. Buttresses are common as is an abundance and diversity of vines. This community is usually associated with RE 12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.8.13, 12.11.1, 12.11.10, 12.12.1, and 12.12.16, none of which were recorded on or adjacent to the site.

- The Poplar Box Grassy Woodland on Alluvial Plains ecological community. No species representing these characteristics or vegetation communities were observed within the subject site. The site is not mapped as containing any regional ecosystem communities associated with this ecological community.
- The White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland TEC is characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs and the dominance of White Box, Yellow Box, or Blakely's Red gum trees. This community is usually associated with RE 11.8.2a, 11.8.8, 11.9.9a, 13.3.1, 13.11.8 and 13.12.9. It can also be a small component of RE11.3.23, 12.8.16, 13.3.4, 13.11.3 and 13.11.4, none of which were recorded on or adjacent to the site.
- Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland Bioregions varies from tall open forest to woodland, although partial clearing may have reduced the canopy to scattered trees in some areas. The tree canopy is dominated by eucalypts and/or other myrtaceous trees (specifically from the *Angophora, Corymbia*, *Lophostemon* and *Syncarpia* genera), often as a mixture of species. A mid-layer or sub-canopy of small trees may be present – with scattered to dense shrubs. 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. Its groundcover typically includes grasses, forbs, ferns, sedges and scramblers. 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, none of which were recorded on or adjacent to the site.
- Grey box-grey gum wet forest of subtropical eastern Australia is described as a forest where the canopy dominated by its characteristic Eucalyptus species (being *Eucalyptus moluccana* or *Eucalyptus propinqua* less commonly *Eucalyptus punctata*) with or without *Araucaria cunninghamii* (hoop pine) and with an understorey that typically includes significant cover of species with drier vine-forest (rainforest) affiliations. In Queensland REs likely to represent or contain the ecological community includes RE 12.9-10.3 and 12.8.14a. None of these associated regional ecosystems were identified within the referral area.

The site contains 18.9 ha of Category B (remnant) vegetation mapped under the Queensland VMA (refer **Figure A4**). The vegetation is mapped as composite RE12.9-10.2/12.9-10.7/12.9-10.19 (65/20/15%) which are classed under the VMA as 'Least Concern', 'Of Concern' and 'Least Concern', respectively (refer **Figure A5**). The vegetation is mapped as 'Essential Habitat' for *Phascolarctos cinereus* (Koala), *Ninox strenua* (Powerful Owl) and *Coleus habrophyllus*. Field survey confirmed that the referral area contains predominantly remnant vegetation with some disturbance in the form of vehicle access tracks. The vegetation on-site is considered to be accurately mapped as 'remnant' vegetation due to the cessation of logging activities. A description of the mapped Regional Ecosystems per the Queensland Herbarium is provided in **Table A6**.

Additionally, the Australian Soil Resource Information System (ASRIS) maps chromosols across the referral area and suit the landscape description outlined below (refer **Figure A6**).

Description	Chromosols are texture-contrast soils. Extensive areas of Chromosols are in the Western Downs and the Maranoa districts—west of the Great Dividing Range.

Table A6: Regional Ecosystem Descriptions (Queensland Herbarium)

Regional Ecosystem	VMA Status	Description
12.9-10.2 (65%)	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. Not a Wetland. (BVG1M: 10b).
12.9-10.7 (20%)	Of Concern	*Eucalyptus crebra* +/- *E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments. Not a Wetland. (BVG1M: 13c).
12.9-10.19 (15%)	Least Concern	*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).

The dominant RE was identified to be 'Least Concern' RE12.9-10.2 due to the dominance of *Corymbia citriodora* (Spotted Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark). Refer to **Photo 1**.

Elements of RE12.9-10.7 and RE12.9-10.19 were present as indicated by the presence of other canopy species including *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus fibrosa* (Broad-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus acmenoides* (White Mahogany) and *Angophora leiocarpa* (Smooth-barked Apple). The understorey contained a mix of *Acacia* species including *Acacia concurrens* (Black Wattle), *Acacia leiocalyx* (Early Flowering Black Wattle), *Acacia disparrima* (Hickory Wattle), *Acacia fimbriata* (Brisbane Wattle), and *Alphitonia excelsa* (Soap Tree). The ground layer was dominated by native forbs and grasses such as *Aristida vagans* (Threeawn Speargrass), *Themeda triandra* (Kangaroo Grass), *Cymbopogon refractus* (Barbed Wire Grass), *Heteropogon contortus* (Black Speargrass), and contained an abundance of leaf litter. The ground layer was largely devoid of weeds except for isolated areas of *Lantana camara* (Lantana) and *Lantana montevidensis* (Creeping Lantana) infestations. The canopy height and coverage of the confirmed 'remnant' RE12.9-10.2 is consistent with the remnant status definition.

The site is considered one (1) Assessment Unit which is described as Remnant Regional Ecosystem 12.9-10.2 and is 18.9 ha in size as shown on **Figure A3**.



Photo 1: Assessment Unit 1 – Remnant RE12.9-10.2

3.2.5 Habitat for threatened species

The site is dominated by remnant eucalypt forest predominantly containing 'Least Concern' RE12.9-10.2. Vegetation within the project area is dominated by eucalypts, with the dominant species being *Corymbia citriodora* (Spotted Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark) with *E. tereticornis* (Forest Red Gum), *E. acmenoides* (White Mahogany) and *Angophora leiocarpa* (Smooth-barked Apple).

Within the original referral technical studies (refer **Attachment A3**) a number of MNES were identified as having the potential to occur within or adjoining the referral area and therefore were targeted as part of the field survey effort. One MNES flora species was observed during field survey effort as being located outside of the referral boundary: *Coleus habrophyllus* (Shaggy-leaved Coleus). The species was located outside of the impact area within dedicated vegetation retention areas and therefore is considered highly unlikely to be impacted by the action. As detailed ecological surveys have been undertaken across the referral area including niche habitat areas, there is a high level of confidence that the balance of the site and impact area does not contain this species.

MNES considered to have potential to occur on or be at higher risk of being impacted by the proposed development as per the revised likelihood of occurrence assessment provided in Table A5 include:

- *Phascolarctos cinereus* (Koala);

- *Pteropus poliocephalus* (Grey-headed Flying-fox);
- *Hirundapus caudacutus* (White-throated Needletail);
- *Lathamus discolor* (Swift Parrot); and
- *Anthochaera phrygia* (Regent Honeyeater).

Species habitat for the above species and additionally *Petauroides volans* (Greater Glider) and *Delma torquata* (Collared Delma) is described in further detail in **Section 3.3**.

Flora species *Gossia gonoclada* (Angle-stemmed Myrtle) and *Coleus habrophyllus* are known to be located proximal to the referral area, and are addressed below.

3.2.5.1 Gossia gonoclada

Gossia gonoclada (Angle-stemmed Myrtle) has been confirmed to occur near the proposed action site within rainforest habitat areas associated with Opossum Creek and Woogaroo Creek. Four (4) Angle-stemmed Myrtle individuals were recorded by the University of Queensland in 2020 and 2021 as part of Myrtle rust surveys of Eastern Australia (Fensham *et al.,* 2021). The records were located along Opossum Creek and Woogaroo Creek within rainforest dominated vegetation, located outside the referral area and adjoining vegetation retention areas proposed as part of the action. One (1) record from the study located along Opossum Creek and dated July 2020 is published on ALA (refer **Plan A4**). No specimens of the species were detected by SHG within or adjoining the disturbance footprint and are considered to be restricted to the dry rainforest vegetation types within Opossum Creek and Woogaroo Creek.

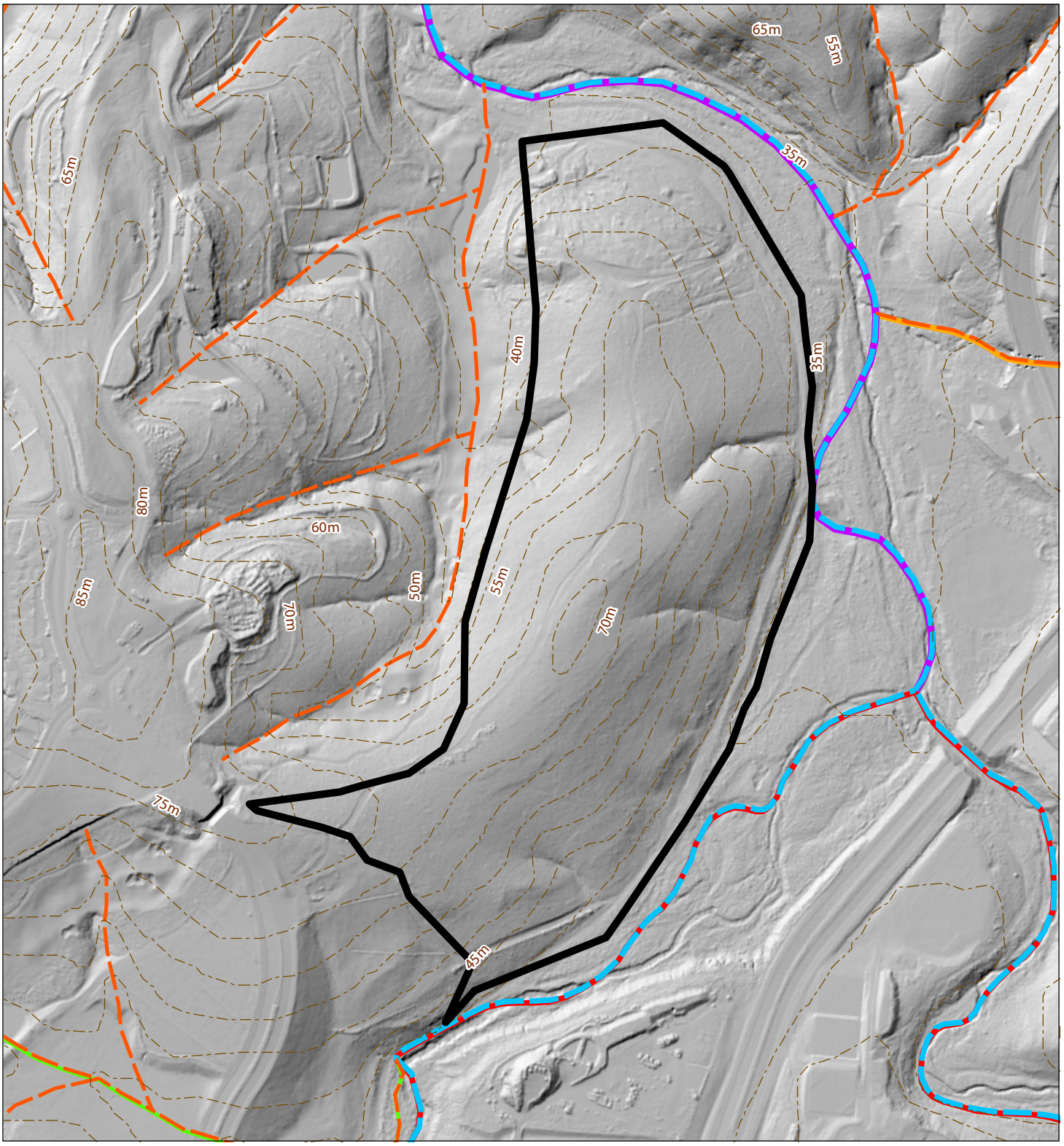
3.2.5.2 Coleus habrophyllus

Coleus habrophyllus occurs on chert or sandstone outcrops, in open woodlands often in shaded situations near vine forest. The species has a highly limited distribution with only seven known populations including: Oxley Creek, Greenbank; Opposum Creek, Springfield; Woogaroo Creek, Goodna; three populations within White Rock Conservation Park, incorporating Six Mile Creek and near Ormeau (south of Beenleigh). *Coleus habrophyllus* specimens have been recorded to the north-west of the subject site adjoining Opossum Creek (refer **Plan A5** and **Photo set 2**).

The referral area and adjoining areas have been traversed multiple times over multiple years by experienced flora ecologists and no specimens or microhabitat to support the species have been recorded within the referral area. The whole referral area has been assessed as part of flora surveys (refer **Plan A5**). SHG Ecologists have over 10 years of experience in detecting this species as part of impact assessments within Greater Springfield. As a result, the species is considered to be highly detectable noting the specific habitat requirements and characteristic features. It is unlikely that any specimens, if present within the referral area, would not have been observed. The confirmed presence of a confined area of specimens north-west of the referral area provides additional certainty that survey effort to detect the species is sufficient.



Photo set 2: ***Coleus habrophyllus*** **specimens observed off-site, adjacent to the north-western boundary**



Legend

- Referral Area
- 5 Metre Contours
- Water Act 2000 - Watercourses
- Water Act 2000 - Drainage Features

Waterways (QLD)

Risk of Impact

- 1 - Low
- 2 - Moderate
- 3 - High
- 4 - Major
- 5 - Major (Tidal)

Figure A3

Site Topography and Water Resources

Springfield City Group Pty Ltd

File ref. 7399 E Figure A3 Topography F
Date *18/08/2026*
Project *Peninsula Precinct*

0 50 100 150 200 *m*

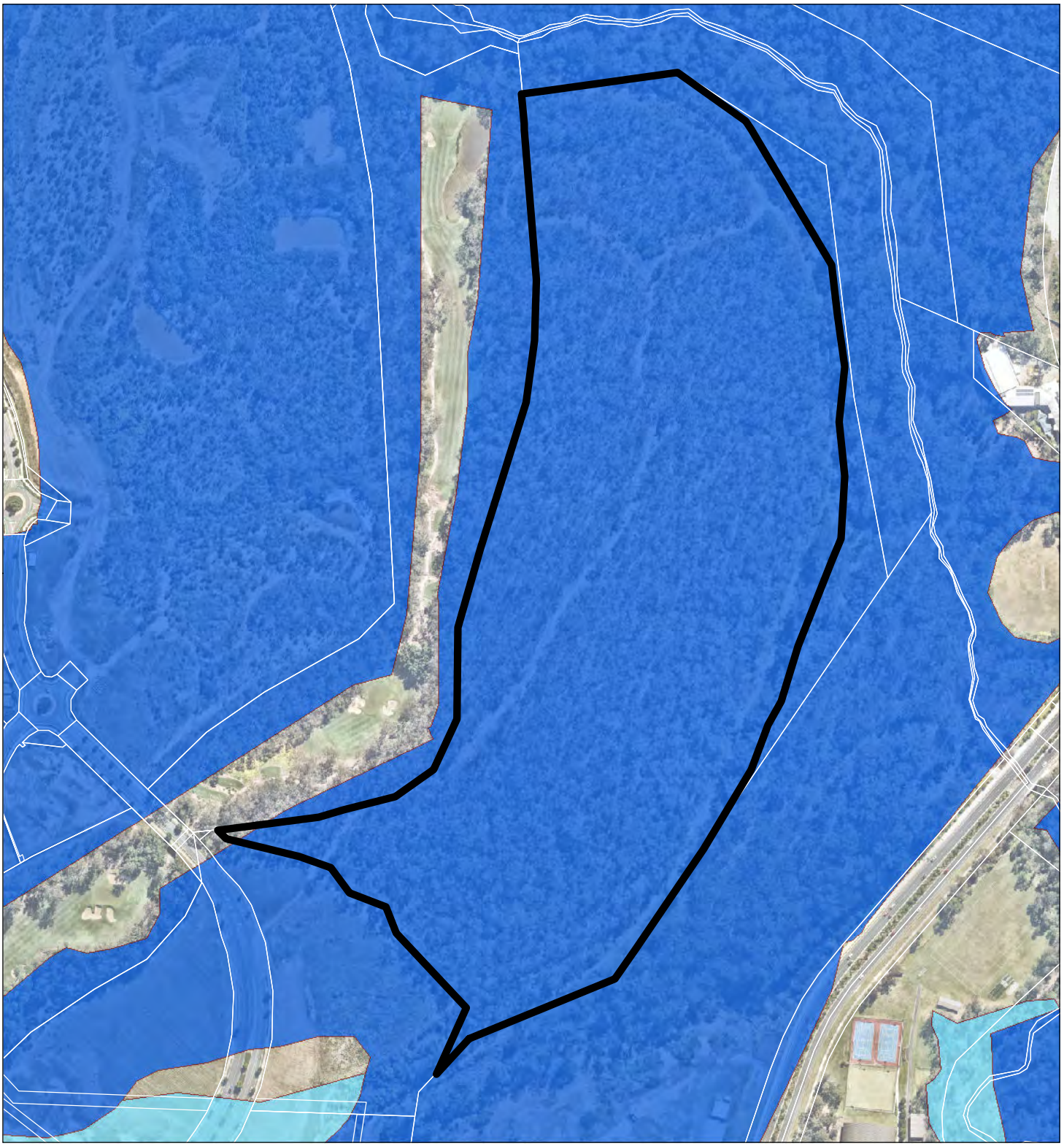
Scale (A4): 1:5,000 [GDA 1994 MGA Z56]

N

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Layer Source: © State of Queensland 2021



Legend

- Qld DCDB
- Referral Area

Regulated Vegetation

- Category A area - *Vegetation Offset/Compliance notices/VDecs*
- Category B area - *Remnant vegetation*
- Category C area - *High value regrowth vegetation*
- Category R area - *Reef regrowth watercourse vegetation*
- Category X area
- Water
- Area not categorised

Figure A4

Regulated Vegetation Management Map (Qld)

Springfield City Group Pty Ltd

File ref. 7399 E Figure A4 RVM QLD F
Date *18/08/2026*
Project *Peninsula Precinct*

0 50 100 150 200 *m*

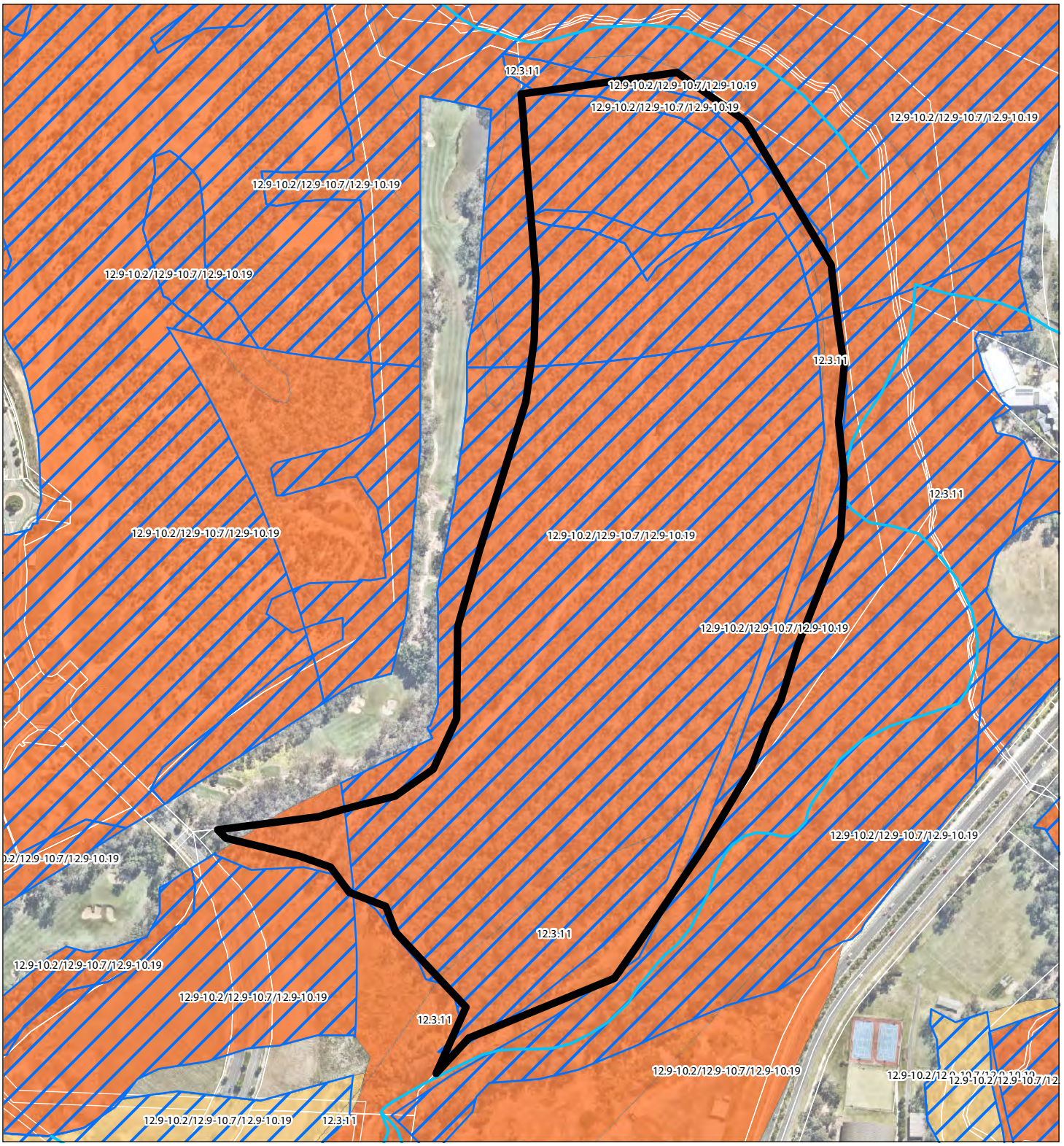
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Scale (A4): 1:4,500 [GDA 1994 MGA Z56]

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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 A5

Vegetation Management Regional Ecosystem Map (Qld)

Springfield City Group Pty Ltd

File ref. 7399 E Figure A5 VMRE F
Date *18/08/2026*
Project *Peninsula Precinct*

0 50 100 150 200 *m*

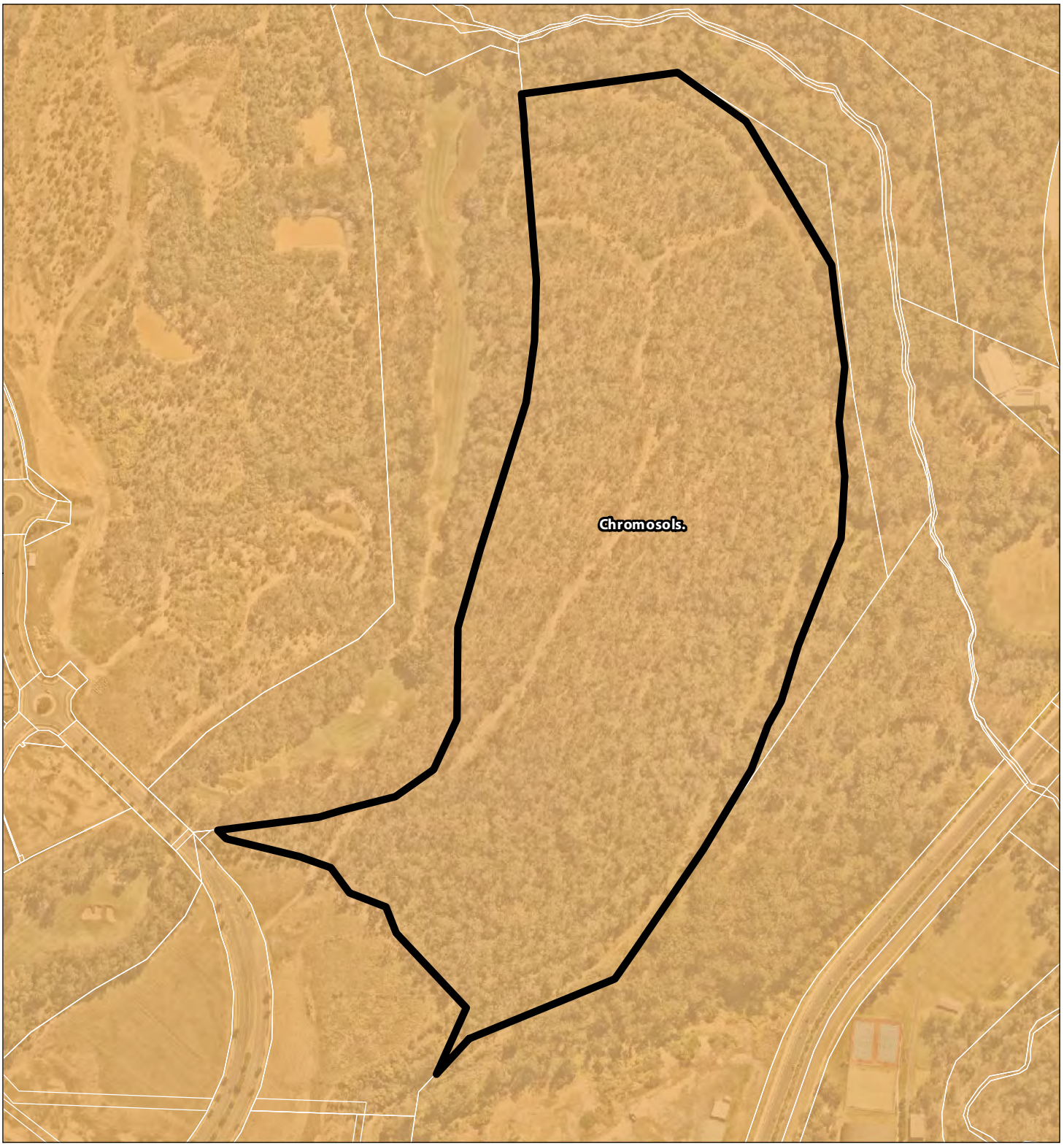
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Scale (A4): 1:4,500 [GDA 1994 MGA Z56]

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Legend

- Qld DCDB
- Referral Area
- Chromosols

Figure A6

ASIRIS Soils

File ref. 7399 E Figure A6 ASIRIS F
Date *18/08/2026*
Project *Peninsula Precinct*

0 50 100 150 200 *m*

N

Scale (A4): 1:4,500 [GDA 1994 MGA Z56]

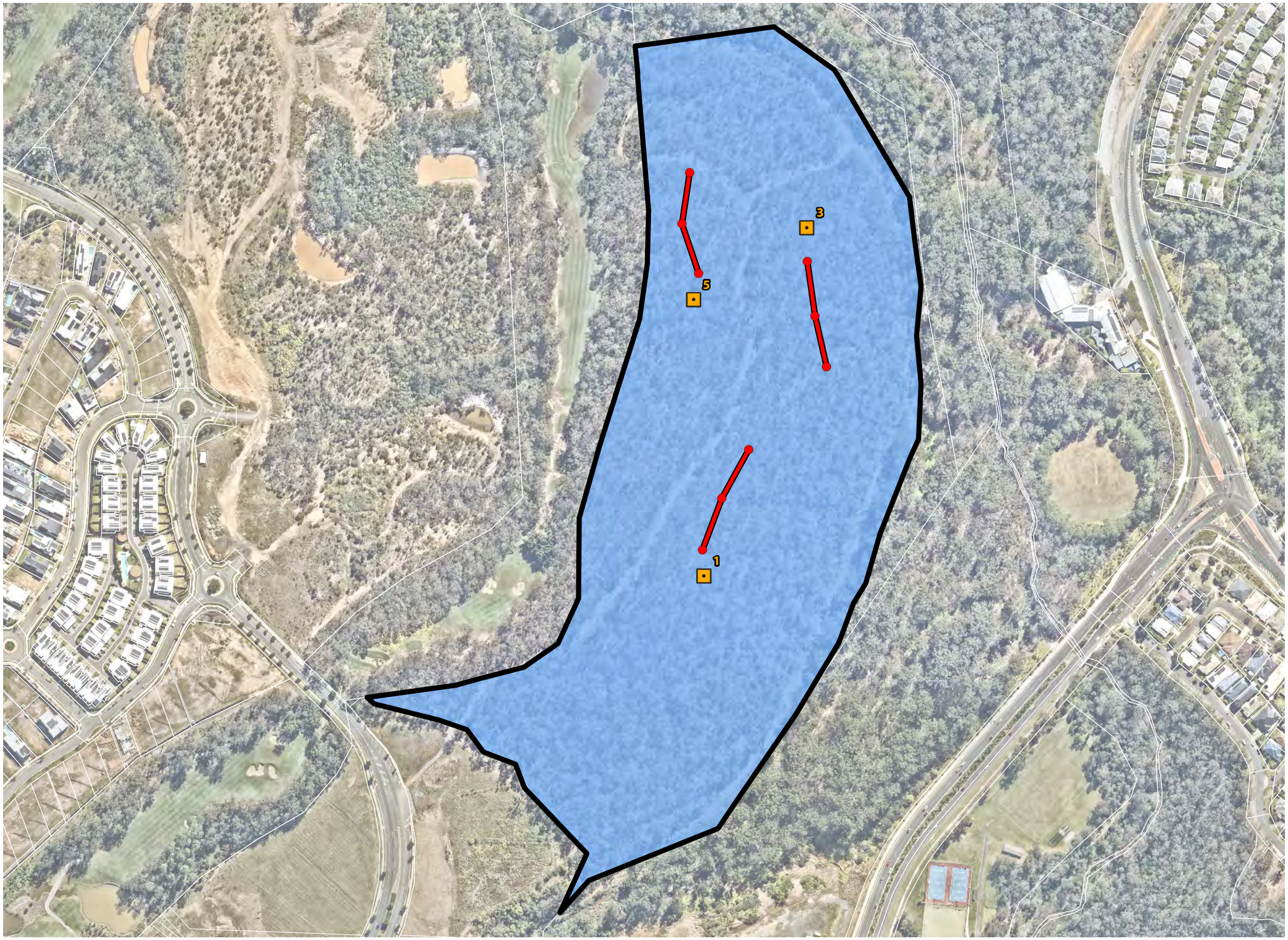
Springfield City Group Pty Ltd

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A3. Assessment Units



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Legend

- Qld DCDB
- Referral Area [18.9 ha]
- Assessment Unit 1 - Remnant RE 12.9-10.2 [18.9 ha]
- Habitat Quality Transect
- SAT Survey Locations

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 25 50 75 100 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:3,500 @ A3

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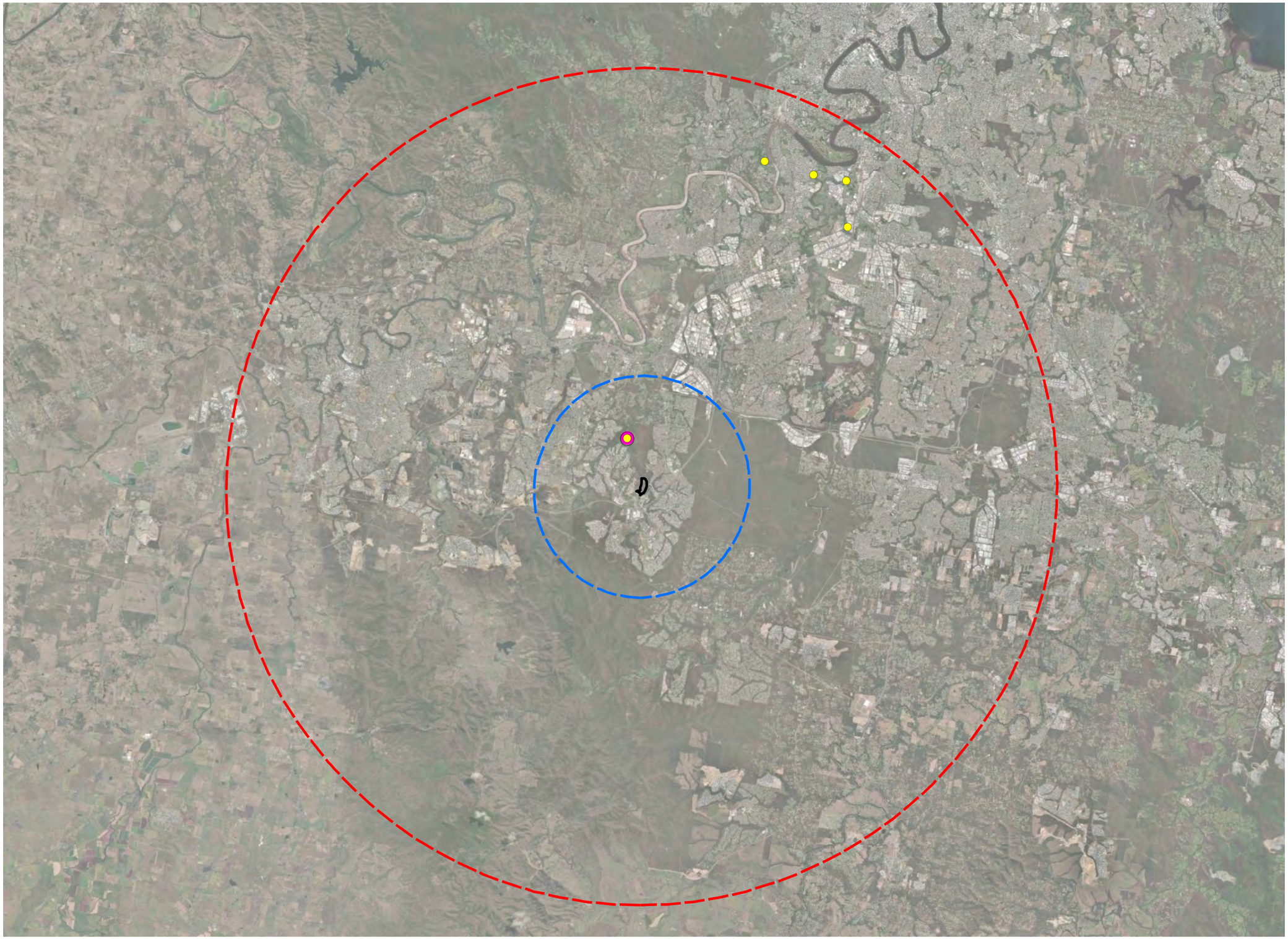
SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A3 Assessment Units F

A4. Gossia Gonoclada Records



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Legend

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Gossia Gonoclada records within the past 20 years within 20km of the referral area. (ALA, 2026) (5)
- Confirmed records as part of University of Queensland myrtle rust surveys (Fensham, R., Laffineur, B., Collingwood, T., Wills, J., and Radford-Smith, J. (2021). Myrtle rust surveys of Eastern Australia 2021. The University of Queensland. Data Collection)

Issue	Date	Description	Drawn	Checked
A	18/08/2026	Preliminary	HW	AW

0 1 2 3 4 5 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:185,000 @ A3

Address / RPD: 51/SP242316

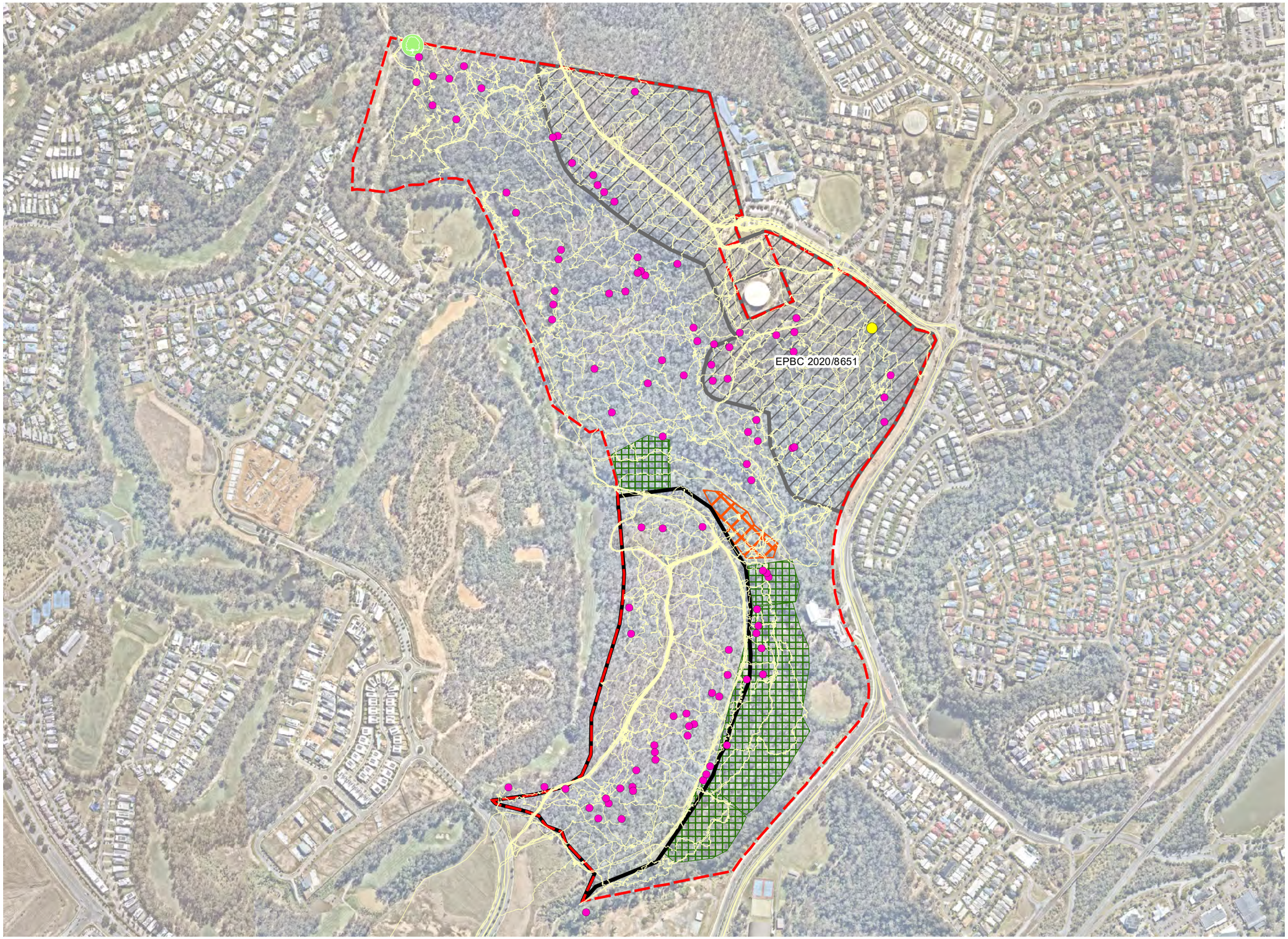
18/08/2026 | 7399 E A4 Threatened flora records A

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A5. Vegetation and flora surveys



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Legend

- Referral Area
- Survey Effort Extent
- Eucalyptus grandis patch
- Celtis sinensis patch
- GPS Tracklog - Meander Survey
- *Coleus habrophyllus* specimens
- *Coleus australis* specimens (syn. Plectranthus parviflorus)

GPS Tree Plot

- Hollow Bearing Tree [101]

Issue	Date	Description	Drawn	Checked
A	18/08/2026	Preliminary	HW	AW

0 50 100 150 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:7,500 @ A3

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Peninsula Precinct

Address / RPD: 51/SP242316

18/08/2026 | 7399 E A5 Vegetation and flora surveys A

3.3 Technical detail on MNES present at, or in the vicinity to, the project site (as listed in 2.1)

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

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

b. Quantification of the extent of habitat and (if known) the number of individuals present, or historical patterns of use on, and surrounding, the development footprint (including maps identifying known or potential habitat).

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

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

e. Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc) and search effort (e.g. 20 hours over 8 days).

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

g. Results of any surveys undertaken."

3.3.1 Swift Parrot (Lathamus discolor)

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

Distribution

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

Habitat and Ecology

Swift parrots 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 in close proximity, 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. Key foraging species include Yellow Gum (*E. leucoxylon*), Red Ironbark (*E. tricarpa*), Mugga Ironbark (*E. sideroxylon*), Grey Box (*E. macrocarpa*), White Box (*E. albens*), Yellow Box (*E. melliodora*), Swamp Mahogany (*E. robusta*), Forest Red Gum (*E. tereticornis*), Blackbutt (*E. pilularis*), and Spotted Gum (*Corymbia maculata*). It is noted that *Corymbia citriodora* is recognised synonymously in terms of foraging value for the species. The species prefers large trees which flower consistently (DCCEEW, 2024).

Threats

The *National Recovery Plan for the Swift Parrot* (DCCEEW, 2024) identifies urban development and tree clearing as a key threat for the species' persistence. In Queensland, urban development is of particular concern to the Swift Parrot at the northern extent of their winter range. In particular, the Gold Coast, Toowoomba and the Greater Brisbane region are at risk from tree removal associated with residential and industrial development.

b. *Quantification of the extent of habitat and (if known) the number of individuals present, or historical patterns of use on, and surrounding, the development footprint (including maps identifying known or potential habitat.*

Swift Parrot habitat within SEQ is limited to foraging resources as their occurrence on the Australian mainland, and therefore in SEQ, is dictated by seasonal dispersal patterns to support the foraging part of their life cycle which only occurs during winter months.

The Swift Parrot has been sighted in the broader locality within the Springfield Lakes area, approximately 1 km south-east of the project area in 2021 and approximately 10 km south-east of the site and in the Logan suburb of Kingston in 2014 approximately 20 km east of the site (refer **Plan A6**). Given the proximity of the site to the location of the recent sightings, there is potential that the vegetation on-site may form part of the broader foraging area for the Swift Parrot.

Foraging resources, and therefore potential foraging habitat, is broadly defined as winter flowering eucalypt trees. Habitat for the swift parrot within the referral area includes winter flowering foraging species being *C. citriodora, E. tereticornis, E. crebra, E. siderophloia, E. moluccana* and *E. fibrosa*. It is noted that the site contains only two (2) of the ten (10) preferred foraging species listed under the National Recovery Plan for the Swift Parrot (DCCEEW, 2024) being *C. citriodora/C. maculata*. As the referral area contains preferred foraging eucalypts which may provide foraging habitat for the species, it is considered to contain critical habitat for the swift parrot.

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

The potential for Swift Parrot to occur in South East Queensland and the broader locality is likely which is supported by the presence of records in the locality within the past five years and the habitat destruction that resulted from the 2019 / 2020 bushfires in the southern portion of the foraging range which may lead to a potential shift in foraging patterns. The potential for Swift Parrot occurrence in the locality is acknowledged, however, the relative importance of the vegetation within the referral area to support swift parrot is considered reduced based on the abundance of foraging resources in the locality that are protected and the quality of potential foraging resources within the referral area.

The quality and importance of foraging habitat has been considered based on landscape and contextual factors and on an assessment of *in situ* values within the referral area.

<u>Context factors</u>

Potential foraging habitat is considered abundant within the landscape and SEQ generally. Within a 5 km and 20 km radius surrounding the referral area, foraging resources are abundant and are predominantly located within contiguous habitat areas located within the Flinders-Karawatha Bioregional Corridor that includes White Rock Conservation Park and the Greenbank Military Training Area (refer **Plan A7**). Mapped swift parrot foraging habitat within SEQ is mapped in **Plan A8** identifying a large volume of potential habitat across the region.

The Greenbank Military Base is located approximately 2 km east of the site and White Rock Conservation Park located within the Flinders-Karawatha Corridor is located approximately 3.5 km south of the site and are considered higher quality foraging habitats which are likely to be preferred over the vegetation on-site (refer **Plan A7**).

On-site factors

It is noted that the Swift Parrot prefers larger diameter foraging trees as they are more productive nectar sources. The site contains scattered trees defined as 'large' under the Queensland Herbarium Benchmark guideline; however, the site is considered to lack old growth eucalypt trees. Large trees are sparse throughout the project area with large specimens largely restricted to Opossum Creek to the south-west of the referral area. Analysis of the Habitat Quality transect data against the BioCondition Benchmark (v3.6) indicates that the average number of trees per hectare equal to or greater than the large tree benchmark for RE12.9-10.2 is four (4). The benchmark of large trees per hectare for the 'remnant' vegetation communities (RE12.9-10.2) as per the Queensland Herbarium Benchmark guideline is 38. As such, the vegetation community within the project area meets approximately 10% of the large tree benchmark for the RE12.9-10.2, indicating reduced quality of potential foraging species for the Swift Parrot.

The placement of the site within an urban location also increases the prevalence of aggressive nectarivorous birds including *Manorina melanocephala* (Noisy Miner) and *Trichoglossus moluccanus* (Rainbow Lorikeet) which were confirmed on-site.

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

No known populations occur within 5 km of the development footprint; however, the site is within the distribution of where the species is likely to occur according to the Swift Parrot Recovery Plan (DCCEEW, 2024). The Swift Parrot was sighted in the locality within the Springfield Lakes area, approximately 1 km south-east of the site in 2021 and in the Logan suburb of Kingston in 2014 approximately 20 km east of the site (refer Plan A6). The presence of a local record suggests potential for the Swift Parrot to occur sporadically within the region.

The Swift Parrot occurs as a single migratory population with breeding occurring in Tasmania and foraging on the Australian mainland. Time spent on the Australian mainland is temporally limited to the foraging season (*i.e.,* winter months) and the documented and potential distribution is spatially quite broad, predominantly encompassing New South Wales and Victoria foraging habitat with some reach into Queensland. Occurrence is limited to flocks or pairs within the foraging range.

The lack of recorded sightings within the locality since the year 2000 may be attributed to the relationship between observers and potential habitat areas. It is likely that potential occurrence of Swift Parrot within the broader locality is confined to habitat areas within the extensive Flinders-Karawatha Bioregional Corridor and White Rock Conservation Park where the chance of observation is inherently limited. Springfield Lakes is a highly frequented area therefore increasing the chance of incidental observation.

e. *Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc) and search effort (e.g. 20 hours over 8 days).*

Noting the cryptic nature of detection for the Swift Parrot and relatively narrow survey window (winter), surveys to detect the presence of Swift Parrot were not completed, with surveys instead focussing on describing and quantifying the availability of potential foraging habitat within the referral area.

Survey plots to measure the availability of preferred foraging habitat for the Swift Parrot was completed in March 2020. Refer to **Section 4.7.1** for details of the survey methodology.

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

It is considered the assessment of foraging habitat values is appropriate for the species as a way of informing the potential for the species to occur and assessment of critical habitat.

The use of a plot or transect is a widely used method for collecting vegetation composition data in a variety of environments and often uses stem counts as an index of habitat quality.

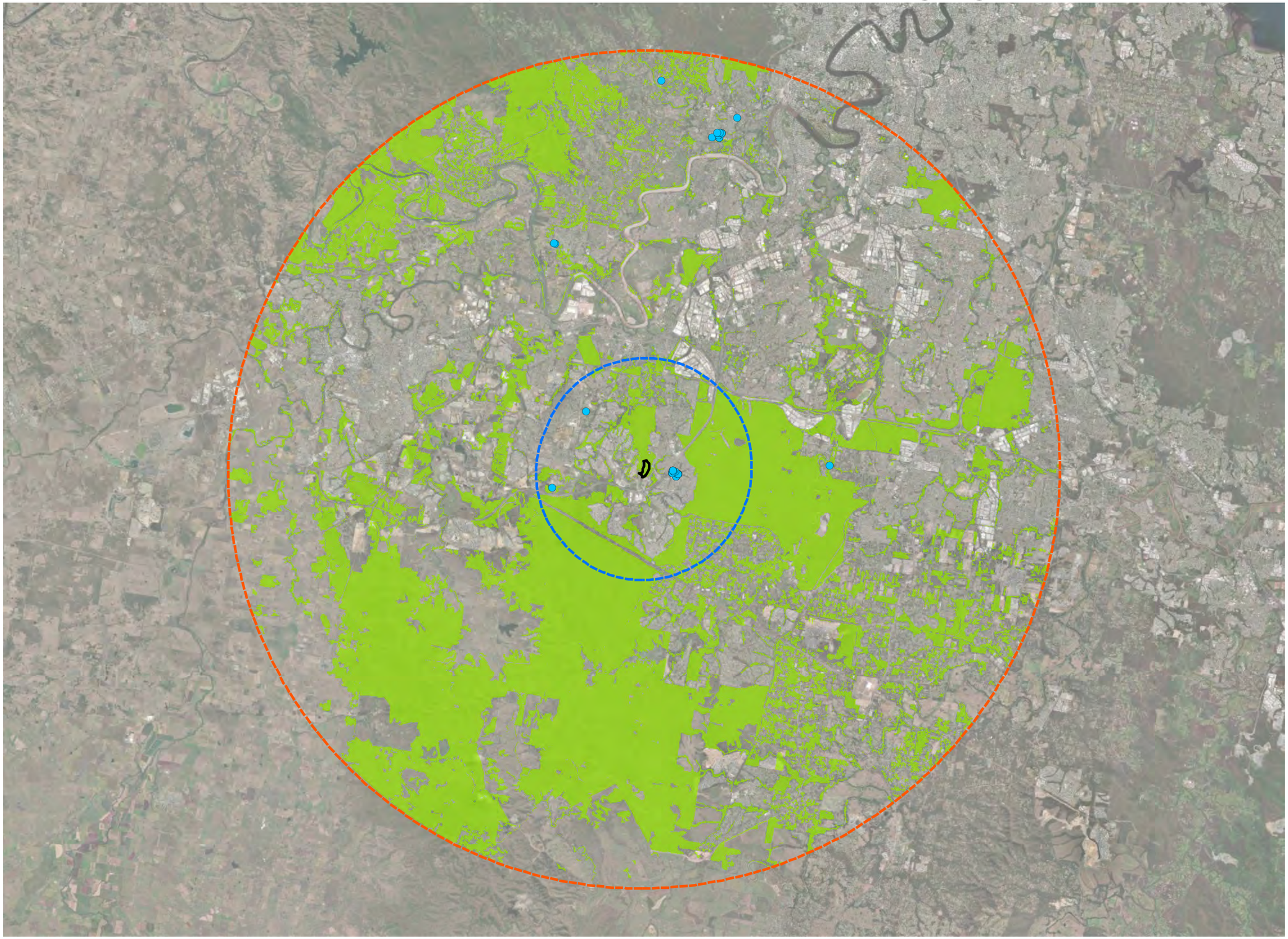
Stem density data of preferred foraging species at each MHQA transect was collected in accordance with the stem count methodology provided in the *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland* (version 5.0) (Neldner et al. 2019). The methodology detailed in Neldner et al. (2019) uses a plot area of 50 X 10 m. For the purposes of this assessment, the area was modified to 100 X 20 m to align with the MHQA plot, however, the actual count assessment method remains the same.

Further details and justification of the methodology is provided in **Section 4.7.1**.

g. *Results of any surveys undertaken.*

Refer to **Section 4.7** for details of the impact assessment.

A6. Swift Parrot records and potential and known foraging habitat



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Legend

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Swift Parrot records within 20km of referral area (ALA, 2025) [40]
- Potential and known Swift Parrot habitat within 20km of referral area [33.6%]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 1 2 3 4 5 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:185,000 @ A3

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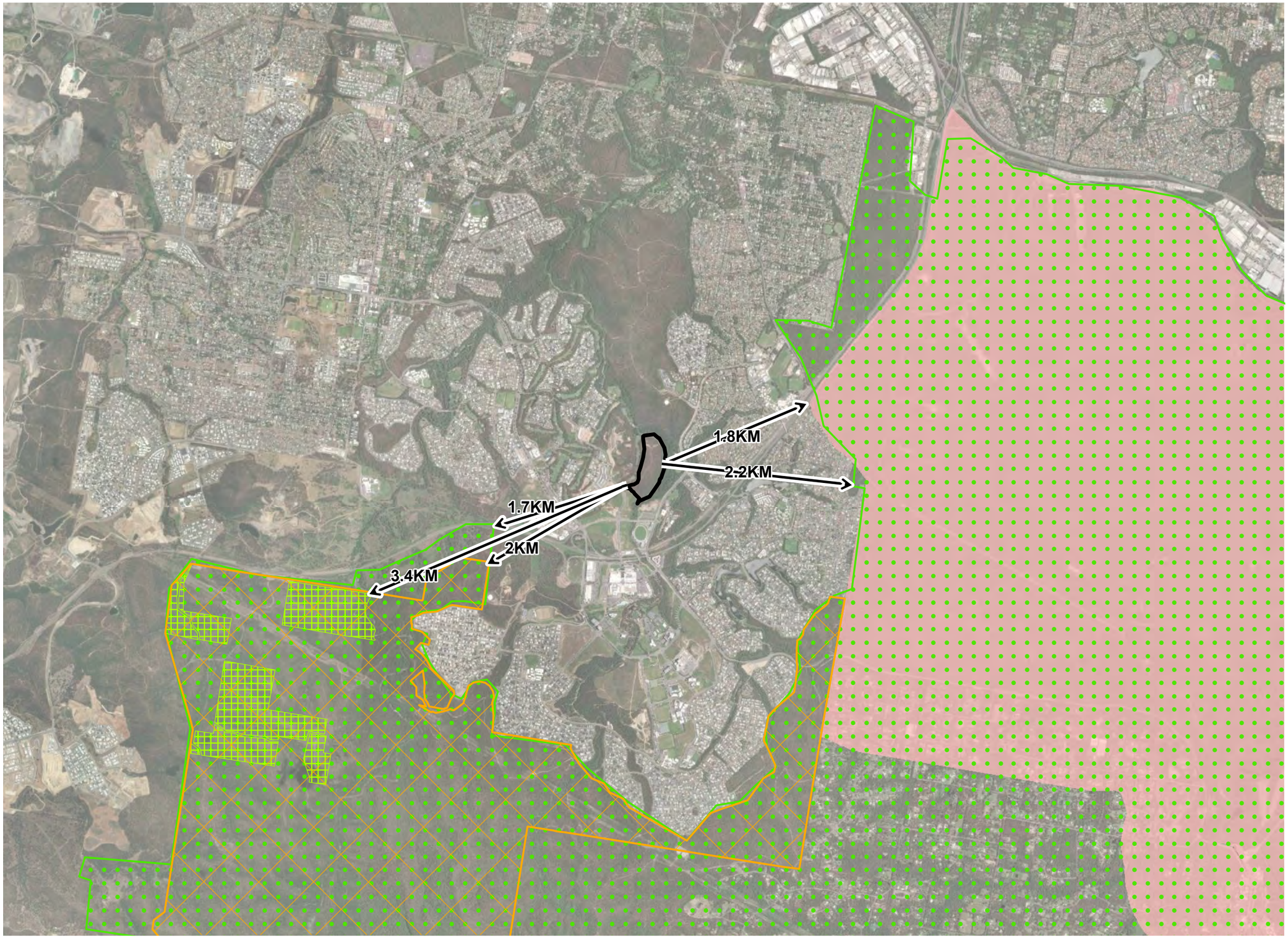
SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A6 Swift Parrot Records Habitat F

A7. Surrounding Conservation Areas



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Legend

- Referral Area

Protected areas, nature refuges and heritage areas

- White Rock Conservation Park
- Greenbank Military Training Area
- Flinders-Karawatha Bioregional Corridor

Ipswich LGA Conservation Areas

- White Rock-Spring Mountain Conservation Estate

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
E	18/08/2026	Amendments	HW	AW

0 200 400 600 800 1,000 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:45,000 @ A3

Address / RPD: 163/SP291400

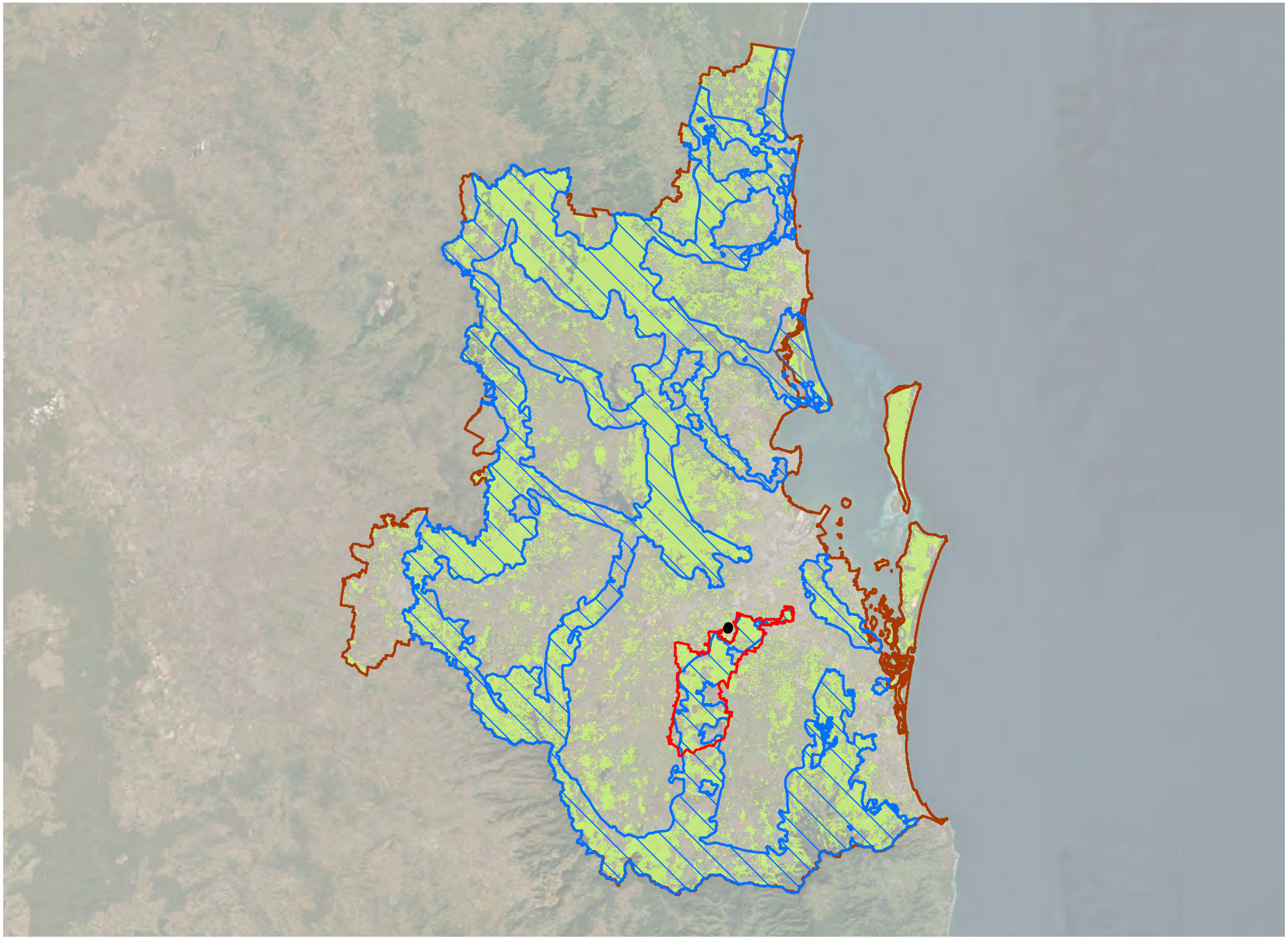
18/08/2026 | 7399 E A7 Surrounding Conservation F

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Peninsula Precinct

A8. Swift Parrot Foraging Habitat SEQ



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Legend

- Referral Area
- SEQ Boundary
- SEQ Regional Plan Biodiversity Corridor
- Flinders-Karawatha Bioregional Corridor
- Swift Parrot Foraging Habitat

Issue	Date	Description	Drawn	Checked
F	18/08/2026	Preliminary	HW	AW

0 10 20 30 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:1,100,000 @ A3

Address / RPD: 51/SP242316

18/08/2026 | 7399 E A8 Swift Parrot SEQ F

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Peninsula Precinct

3.3.2 Regent Honeyeater (*Anthochaera phrygia*)

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

Distribution

The Regent honeyeater is endemic to mainland south-eastern Australia. It has a patchy distribution which extends from south-east Queensland, through 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 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.* Mistletoe species important for foraging include *Amyema cambagei*, *A. miquelii* and *Dendropthoe vitellina* (DoE, 2016).

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 and (if known) the number of individuals present, or historical patterns of use on, and surrounding, the development footprint (including maps identifying known or potential habitat.

Regent Honeyeater habitat within SEQ is limited to foraging resources as their occurrence on the Australian mainland, and therefore in SEQ, is dictated by seasonal dispersal patterns to support the foraging part of their life cycle which only occurs during winter months.

The Regent Honeyeater was recorded in 2019 approximately 3.5 km to the south of the site in the Springfield Lakes area. The presence of a local record suggests potential for Regent Honeyeater to occur sporadically within the region. Refer to **Plan A9** for the location of records and potential habitat surrounding the referral area.

In terms of foraging tree species, the Regent Honeyeater relies on winter flowering eucalypt trees for foraging within its foraging range. A total of thirteen (13) eucalypt species have been observed on-site which includes four (4) winter flowering species. Key foraging species observed within the referral area include *Corymbia citriodora* (Spotted Gum), *Eucalyptus tereticornis* (Forest Red Gum) and *E. fibrosa* (Broad-leaved Ironbark) with *E. crebra* (Narrow-leaved Ironbark). Only one (1) preferred foraging species listed under the National Recovery Plan for the Regent Honeyeater (DoE, 2016) is present within the referral area being *C. citriodora*/*C. maculata*. *Eucalyptus fibrosa* is also identified as a regionally important winter flowering species due to its ability to provide important nectar flows (DoE 2016). As the site contains species with flowering phenologies that are required by the Regent Honeyeater to meet foraging requirements in Queensland, it is considered potential habitat for the species.

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

The potential for Regent Honeyeater to occur in South East Queensland and the broader locality is likely which is supported by the presence of records in the locality within the past five years and the habitat destruction that resulted from the 2019 / 2020 bushfires in the southern portion of the foraging range which may lead to a potential shift in foraging patterns. The potential for Regent Honeyeater occurrence in the locality is acknowledged, however, the relative importance of the vegetation within the referral area to support the species is considered reduced based on the abundance of foraging resources in the locality that are protected compared to the quality and abundance of preferred foraging resources within the referral area, examined further below.

The quality and importance of foraging habitat has been considered based on landscape and contextual factors and on an assessment of *in situ* values within the referral area.

<u>Context factors</u>

Potential foraging habitat is considered abundant within the landscape and SEQ generally. Within a 5 km and 20 km radius surrounding the referral area, foraging resources are abundant and are predominantly located within contiguous habitat areas located within the Flinders-Karawatha Bioregional Corridor that includes White Rock Conservation Park and the Greenbank Military Training Area (refer **Plan A9**).

Mapped Regent Honeyeater foraging habitat within SEQ is shown on **Plan A10** identifying a large volume of potential habitat across the region connected via regional corridors, indicating availability of foraging resources is unlikely to be a limiting factor for the species within SEQ.

On-site factors

While the site contains potential foraging habitat, it is not considered important for the Regent Honeyeater, in the context of higher quality and protected foraging habitat available in the landscape and potential for high incidence of competition from other species. The Regent Honeyeater prefers the wettest, most fertile sites within box-ironbark associations such as along creek flats, broad river valleys and foothills of which the site is lacking. The Greenbank Military Base is located approximately 2 km east of the site and White Rock Conservation Park located within the Flinders-Karawatha Corridor is located approximately 3.5 km south of the site and are considered higher quality foraging habitats which are likely to be preferred over the vegetation on-site.

It is noted that the Regent Honeyeater prefers larger diameter foraging trees as they are more productive nectar sources. The site is highly lacking these large, old growth trees due to historical land management practices. Analysis of the Habitat Quality transect data indicates that the average number of trees per ha equal to or greater than the large tree benchmark for RE12.9-10.2 is four (4). The benchmark of large trees per hectare for the 'remnant' vegetation communities (RE12.9-10.2) as per the Queensland Herbarium BioCondition Benchmark (v3.6) guideline is 38. As such, the vegetation community within the project area meets approximately 10% of the large tree benchmark for RE12.9-10.2.

The placement of the site within an urban location also increases the prevalence of aggressive nectarivorous honeyeaters such as the *Manorina melanocephala* (Noisy Miner) and *Philemon corniculatus* (Noisy Friarbird) which were confirmed on-site and are demonstrated to outcompete Regent Honeyeaters.

Given the mobility of the species and abundance of preferential foraging habitat within close proximity of the site (Greenbank Military Base and White Rock Conservation Park located within the Flinders-Karawatha Corridor), potential foraging habitat on-site is not considered of a significant or high quality.

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

The Regent Honeyeater was recorded in 2019 approximately 3.5 km south of the site in the Springfield Lakes area (refer **Plan A9**). The presence of a local record suggests potential for Regent Honeyeater to occur sporadically within the region, however, no populations are known to occur within 5 km of the development footprint.

e. Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc) and search effort (e.g. 20 hours over 8 days).

Noting the cryptic nature of detection for the Regent Honeyeater and relatively narrow survey window (winter), surveys to detect the presence of Regent Honeyeater were not completed, with surveys instead focussing on describing and quantifying the availability of potential foraging habitat within the referral area.

Survey plots to measure the availability of preferred foraging habitat for the Regent Honeyeater was completed in March 2020. Refer to **Section 4.8.1** for details of the survey methodology.

Preferred foraging habitat include species identified as preferred foraging species under the National Recovery Plan for the Regent Honeyeater (DoE, 2016).

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

It is considered the assessment of foraging habitat values is appropriate for the species as a way of informing the potential for the species to occur and assessment of critical habitat.

The use of a plot or transect is a widely used method for collecting vegetation composition data in a variety of environments and often uses stem counts as an index of habitat quality.

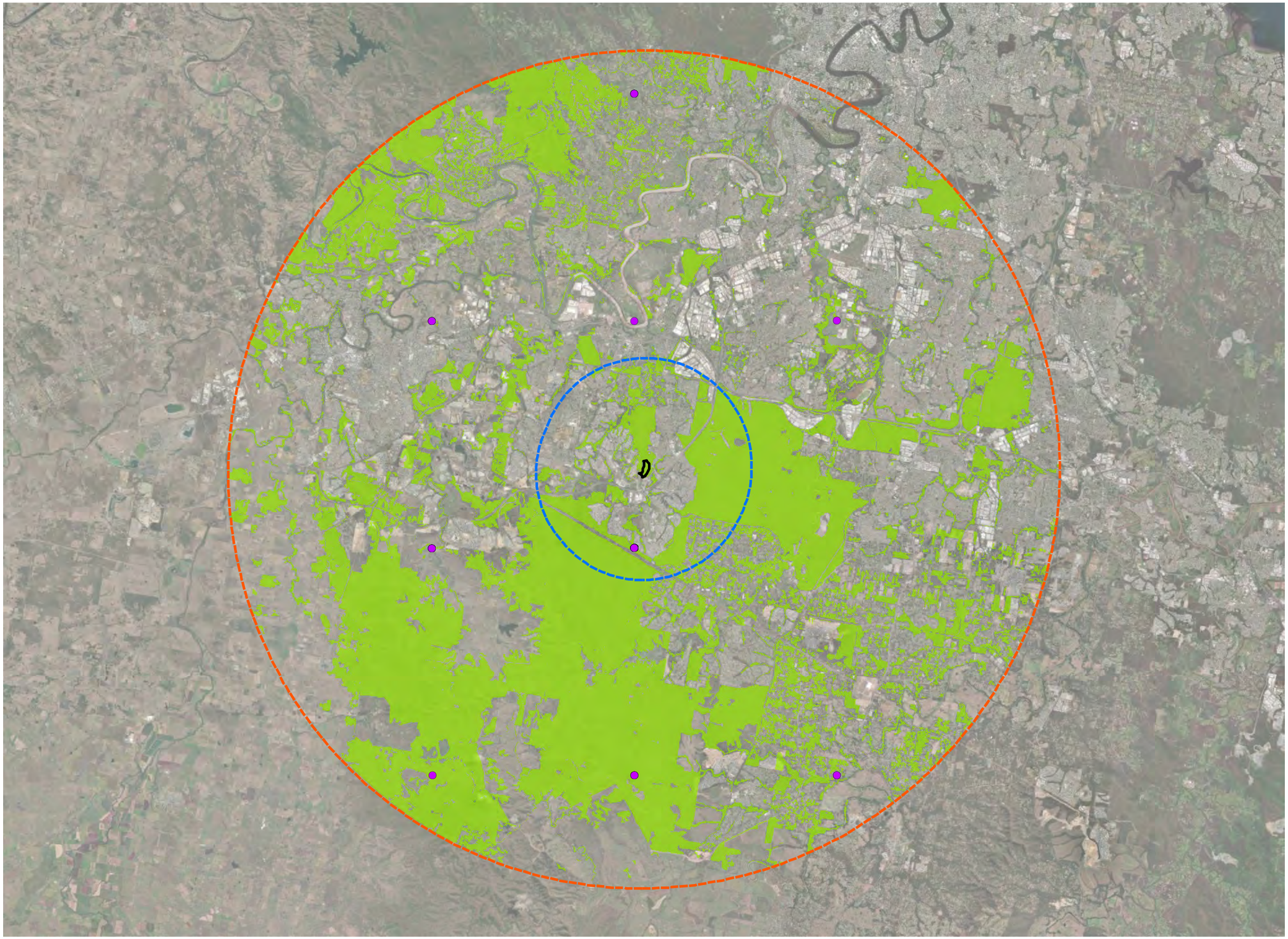
Stem density data of preferred foraging species at each MHQA transect was collected in accordance with the stem count methodology provided in the *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland* (version 5.0) (Neldner et al. 2019). The methodology detailed in Neldner et al. (2019) uses a plot area of 50 X 10 m. For the purposes of this assessment, the area was modified to 100 X 20 m to align with the MHQA plot, however, the actual count assessment method remains the same.

Further details and justification of the methodology is provided in **Section 4.8.1**.

g. Results of any surveys undertaken.

Refer to **Section 4.8** for details of the impact assessment.

A9. Regent Honeyeater records and potential and known foraging habitat



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Legend

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Regent Honeyeater records within 20km of referral area (ALA, 2025) [191]
  Note: Records are generalised on a grid system for protection of the species.
- Potential and known Regent Honeyeater habitat within 20km of referral area [33.6%]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 1 2 3 4 5 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:185,000 @ A3

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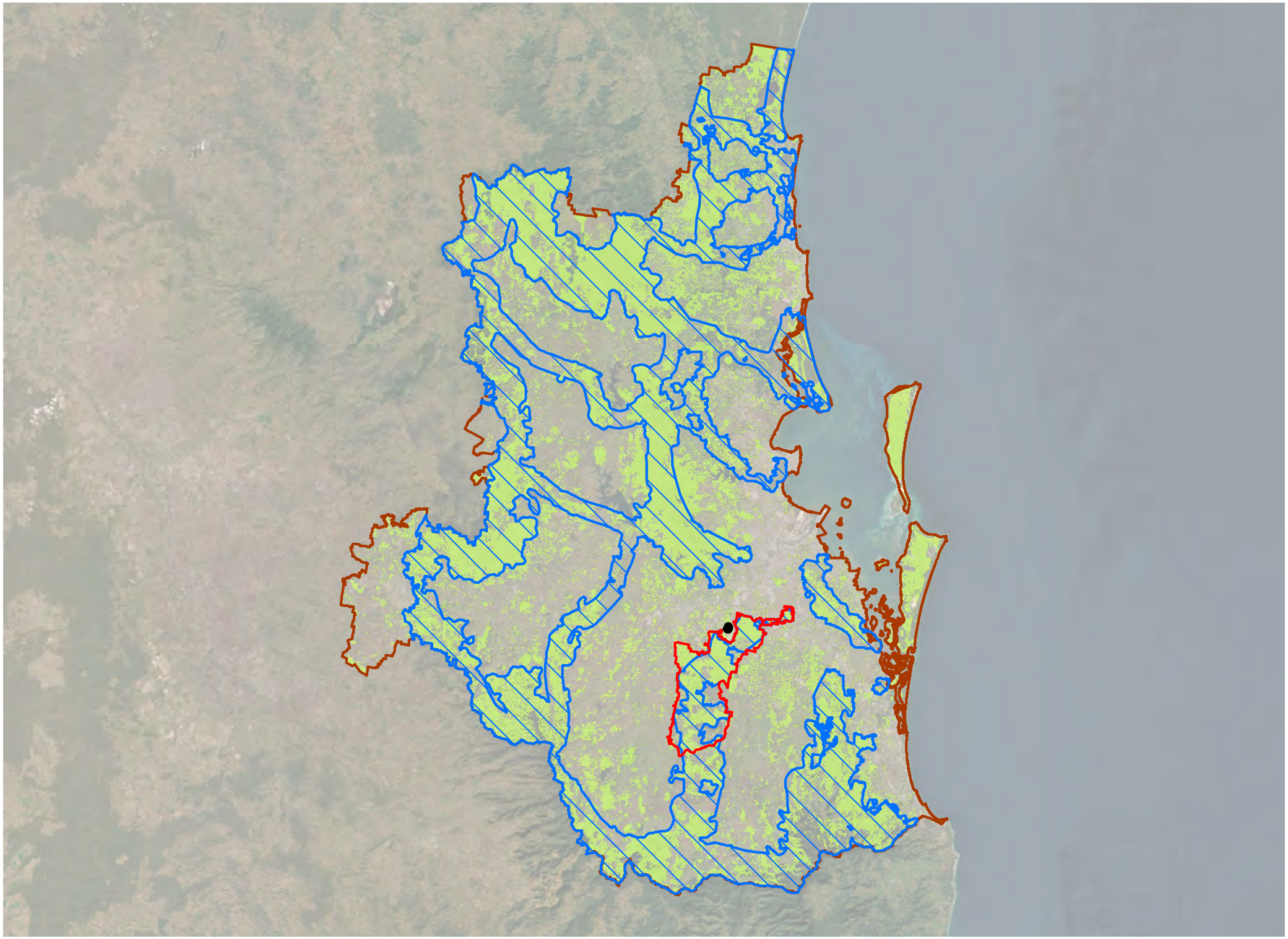
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18/08/2026 | 7399 E A9 Regent Honeyeater Records Habitat F

A10. Regent Honeyeater Foraging Habitat SEQ



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Legend

- Referral Area
- SEQ Boundary
- SEQ Regional Plan Biodiversity Corridor
- Flinders-Karawatha Bioregional Corridor
- Regent Honeyeater Foraging Habitat

Issue	Date	Description	Drawn	Checked
F	18/08/2026	Preliminary	HW	AW

0 10 20 30 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:1,100,000 @ A3

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Peninsula Precinct

Address / RPD: 51/SP242316

18/08/2026 | 7399 E A10 Regent Honeyeater SEQ F

3.3.3 White-throated Needletail (*Hirundapus caudacutus*)

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

Distribution

White-throated Needletails often occur in large numbers over eastern and northern Australia.

Habitat and Ecology

This species is a non-breeding migrant to Australia, arriving from their breeding grounds in the northern hemisphere in October each year and leaving between May and August.

White-throated Needletails are aerial birds and because of this, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations, or remnant vegetation at the edge of paddocks.

b. Quantification of the extent of habitat and (if known) the number of individuals present, or historical patterns of use on, and surrounding, the development footprint (including maps identifying known or potential habitat.

The ALA spatial portal shows several records within the broader landscape, with the closest being approximately 1.9 km south-east within the Springfield Lakes area, recorded in 2018 (refer **Plan A12**). Historical records include one record published in 1990 located approximately 2.3 km north-west of the site, another in 1990 is located directly south of the site and one approximately 3.5 km south of the site within the suburb of Spring Mountain when the landscape was historically much more vegetated.

Approximately 18.90 ha of vegetation containing potential habitat for the White-throated Needletail is located on-site. In the broader landscape, higher quality and vast areas of habitat are present within the Greenbank Military Base located 2 km east of the site and White Rock Conservation Park located within the Flinders-Karawatha Corridor approximately 3.5 km south of the site.

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

The site contains vegetation that is potential foraging and roosting habitat for the White-throated Needletail, however, given the extent of potential habitat in the broader landscape associated with the large areas of nearby protected land including the Greenbank Military Base located approximately 2 km east of the site and White Rock Conservation Park located within the Flinders-Karawatha Corridor approximately 3.5 km south of the site, the small area of habitat on-site is not considered to comprise important habitat for the species.

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

Detailed analysis of public database records show several records White-throated Needletail within 5 km of the project area within the past 20 years (refer **Plan A11**). This is consistent with a broad landscape use across potential habitat.

e. Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc) and search effort (e.g. 20 hours over 8 days).

A total of five (5) dawn bird surveys over five (5) days were completed in January 2021 (summer) which were completed between 08:00 and 11:00 hrs (24 hr time) (refer **Plan A10**). Surveys included carefully watching the airspace above the site from a vantage point adjacent to the site and also by walking through the vegetation on-site. Further, two (2) dusk surveys were completed in September 2023 (spring) for a period of two (2) hours each from 16:00 to 18:00 hrs. Total survey effort was approximately 20 hours. A summary of these survey dates is provided in **Table A7**. A full summary of bird survey methodology is provided in **3.4.3.1**.

Table A7: White-throated Needletail targeted survey dates

Survey date	Survey type	Survey effort
6 January 2021	Dawn bird survey Targeted threatened bird surveys – Dawn	3 hrs
7 January 2021	Dawn bird survey Targeted threatened bird surveys – Dawn	3 hrs
8 January 2021	Dawn bird survey Targeted threatened bird surveys – Dawn	3 hrs
11 January 2021	Dawn bird survey Targeted threatened bird surveys – Dawn	3 hrs
12 January 2021	Dawn bird survey Targeted threatened bird surveys – Dawn	3 hrs
11 September 2023	Targeted threatened bird surveys – Dusk	2 hrs
20 September 2023	Targeted threatened bird surveys – Dusk	2 hrs
Total		**19 hrs**

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

Surveys for were in accordance with the requirements listed on the SPRAT profile which states that surveys must be conducted between October and April in eastern Australia. However, survey methodologies for the

species are vague. The completed survey effort is considered adequate to assess detection of White-throated Needletail.

According to the SPRAT profile, the White-throated Needletail has not been well surveyed throughout Australia as it is difficult to conduct systematic surveys due to its mobility and ability to cover huge distances in a day. In the past there have been attempts to survey the species by soliciting and collating sightings from scattered observers at disparate sites throughout the species' range in Australia between 1951 and 1967, and though they were organised, these cannot be considered to have been systematic. It is unlikely that further survey efforts would be able to provide more information regarding the species' location on and around the site.

g. Results of any surveys undertaken.

During the targeted surveys, a flock of swifts of approximately 15 individuals was observed flying over the site on 8 January 2021. Due to the high altitude of the flock in the airspace and highly mobile nature, it was difficult to confirm an identification of the species at the time of survey. It was noted that the birds were quite large and had a square-shape tail which is a characteristic feature of the White-throated Needletail. The species is quite distinct, as it is larger than other swifts that occur in Australia, such as the Fork-tailed Swift, and its blunt tail instantly distinguishes it from that species.

Based on the similarity of the observed features to that of the White-throated Needletail, there is a high likelihood that the observed specimens were White-throated Needletails. Notably, the flock was not observed during the survey to be utilising the vegetation on-site for roosting, with activity restricted to the airspace above the site.

A11. White-throated Needletail records and potential and known foraging habitat



Notes:
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Legend

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- White-throated Needletail records within 20km of referral area (ALA, 2025) [1,766]
- Potential and known White-throated Needletail habitat within 20km of referral area [33.6%]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 1 2 3 4 5 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:185,000 @ A3

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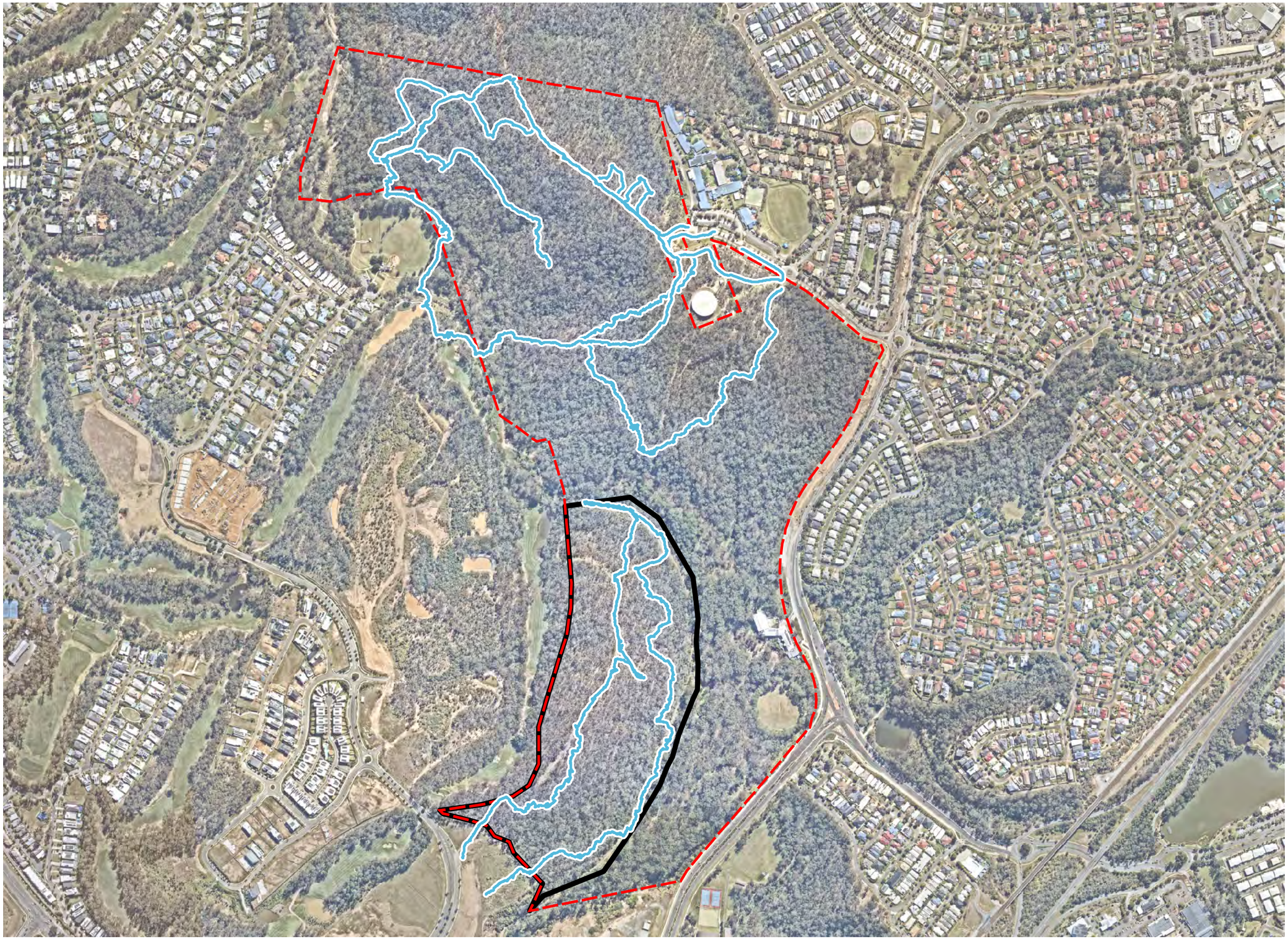
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18/08/2026 | 7399 E A11 WTN Records Habitat F

A12. White-throated Needletail Surveys



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- Referral Area
- SHG Survey Effort Extent
- Bird Surveys – January 2021 (Summer)

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 50 100 150 200 m

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Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A12 White-throated Needletail Surveys F

3.3.4 Koala (*Phascolarctos cinereus*)

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

Distribution

The EPBC Act listed Koala is found from north east Queensland to the southern New South Wales state border. 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.

Habitat and Ecology

In South East Queensland, a recent study completed by Rhodes et al. (2015) indicates that the average Koala density across the region is estimated to be 0.04 Koalas/ha. The majority of the region is predicted to have low population densities, suggesting that Koalas in SEQ may be relatively widely distributed, but of low density in most areas (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. Utilising this data and extrapolating the more recent figures, 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. The Rhodes et al. (2015) survey also indicates that the Koala density in Ipswich is approximately 0.033 Koalas/ha based on surveys completed in 2011 and 2012.

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 (Thompson 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).

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*.

Current data indicate that Koalas in the South East Queensland (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 South East Queensland.

Threats

DERM (2009) identified that the largest declines occurred in bushland areas which showed a 59% reduction in Koala numbers compared with a 30% reduction in urban areas. The large reduction of Koalas in otherwise secure bushland was thought to be a flow on effect from excessive habitat loss and mortality in urban areas (DERM 2009). DERM (2009) concluded that the reduction in adequate recruitment to apparently secure bushland habitat areas is likely to be evidence of a dynamic process operating between the urban and bushland Koala populations. DERM (2010) concluded that whilst there was a decline detected between the 2008 and 2010 surveys, the apparent difference was not statistically significant, meaning that there was no clear evidence of a decrease between the two years when margins of error were considered. DERM (2010) also concluded that the long-term downward trend since the 1996-1999 survey was still statistically significant, showing a 68 per cent decline between 1996-1999 and the most recent (2010) survey.

The influence of wild dog predation within the Ipswich City Council Local Government (LGA) is largely unknown as data within the LGA consists predominantly of publicly reported records collated by the Ipswich Koala Protection Society (ICC, 2017). However, dog attacks and vehicle strikes have been identified as primary threats within the LGA by the local government (ICC, 2017). Generally speaking, 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. While this study was not completed within the Ipswich City Council LGA, it represents one of the few dedicated studies successful in illustrating the significance of the threat of wild dogs on the Koala in urban and peri-urban areas. The findings of this study and threat of wild dogs is corroborated by multiple studies (Beyer et al., 2018; Hanger et al., 2017; Mifsud, 2011).

b. Quantification of the extent of habitat and (if known) the number of individuals present, or historical patterns of use on, and surrounding, the development footprint (including maps identifying known or potential habitat.

The Koala has the potential to occur on site as the site is dominated by vegetation containing non-juvenile Koala habitat trees (NJKHTs). Approximately 18.9 ha of remnant vegetation containing suitable habitat for the Koala is present on-site (refer **Plan A13**).

Vegetation surveys conducted across the site determined the property is dominated by species that achieve the definition of 'woodland' and 'forest' as referenced in the Koala Referral Guidelines. Ecological survey of the site shows the referral area is predominantly dominated by species of the genus *Corymbia* and *Eucalyptus*. Specifically, these species included *Corymbia citriodora* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus acmenoides* (White Mahogany). This vegetation was determined to consist of one (1) vegetation community, defined as RE12.9-10.2.

The vegetation within the referral area is also part of a larger patch extending to the north-east, however, these areas are earmarked for development under (EPBC 2019/8575 and EPBC 2020/8651). The referral area is surrounded by incompatible land uses to the east and north of the site in the form of main roads, a school and residential areas. Opossum Creek adjoins the site to the west which will notably be retained within the landscape, providing ecological connection to the north. It is considered that movement capacity is limited to the north and east of the site due to the presence of main roads (Springfield Parkway), Springfield Anglican College and residential areas.

Areas of ecological significance and preferred Koala habitat are present within the broader locality including Flinders-Karawatha Bioregional Corridor, White Rock Conversation Area, Greenbank Military Training Area and the White Rock-Spring Mountain Conservation Estate (refer **Plan A7**).

The species is known to occur within the Springfield locality and evidence of activity has been confirmed within and adjoining the referral area via ecological assessment and through review of publicly available records on ALA. These records are shown on **Plan A14**.

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

The referral area contains 18.9 ha of vegetation identified as suitable for the Koala (refer **Plan A13**) and is located within a broader patch of vegetation which represents a large pocket of vegetation surrounded by urban development. While the referral area is part of a large remaining pocket of vegetation, connectivity to surrounding contiguous vegetation areas is highly compromised, except via Opossum and Woogaroo Creeks. It is important to recognise that these habitat areas do not link with broader habitat areas where local populations of Koala are more likely to be present such as within White Rock Conservation Park due to the presence of land barriers including Centenary Highway, arterial roads and surrounding residential areas.

A habitat connectivity and sustainability analysis was completed by BAAM Ecological Consultants to examine the surrounding barriers to movement for the Koala and the capacity of the vegetation retention areas and surrounding creekline areas to support the local Koala population. The analysis is provided at **Attachment A4**.

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

Detailed analysis of public records (ALA) show approximately 200 records of the Koala within a 5 km radius of the project area in the past 20 years (refer **Plan A12**). Some of these records are confirmed within the adjoining Opossum Creek corridor, confirming use as a Koala movement corridor.

Additionally, DETSI Koala hospital records show a large portion of Koala records to the north of the referral area have been for sick / injured or deceased individuals. The data available suggest a Koala population is present within the immediate and broader locality, however, due to the urban / residential designation to support a growing population, risk to Koala has increased. More specific population information within 5 km or more of the referral area such as relating to the size of the population are not known other than what can be extrapolated via records.

e. *Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc) and search effort (e.g. 20 hours over 8 days).*

Spotlighting and Wildlife Aerial Thermal drone surveys

During September 2023, targeted nocturnal Koala detection surveys were conducted within the refereral area for a period of three (3) nights which included a combination of spotlighting and RPA (remotely piloted aircraft). Surveys were completed generally in accordance with the *Survey Guidelines for Australia's Threatened Mammals.*

Spotlighting surveys were completed on 11, 13 and 20 September 2023. Targeted surveys involved spotlighting on-foot by two (2) SHG ecologists for approximately 15 hours across the entire Peninsula Precinct and adjoining areas of the Opossum Creek habitat corridor as per recommended survey guidelines (refer **Plan A15**). During two (2) of the three (3) nights of spotlighting, targeted Wildlife Aerial Thermal surveys were also conducted simultaneously by two (2) SHG mapping personnel. These surveys involved using RPA (remotely piloted aircraft) equipped with a thermal sensor to detect the presence of Koala within the referral area. The methodology and findings of the wildlife aerial thermal surveys are provided at **Attachment A4**.

A summary of survey dates and methods applied by for targeted surveys focusing on direct observation is provided in **Table A8**, below.

Table A8: Summary of targeted Koala surveys

Survey date	Methods applied	Survey effort
23 January 2020	SAT surveys	60 minutes
24 January 2020	SAT surveys	60 minutes
11 September 2023	Spotlighting	300-person minutes
13 September 2023	Spotlighting, RPA Wildlife Aerial Thermal surveys	60-person minutes
20 September 2023	Spotlighting, RPA Wildlife Aerial Thermal surveys	Two transect lines – 360-person minutes and 180-person minutes

Spot Assessment Technique Method

In accordance with the *EPBC Act Referral Guidelines for the Vulnerable Koala*, the Spot Assessment Technique (SAT) was applied in to search the site for the potential presence of the Koala. The SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT involves identifying a focal tree where a Koala or scats are found. The next closest habitat tree to the first tree is then assessed and so on until the 30 closest trees to the original focal tree have been recorded. The number of trees showing evidence of Koalas is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage. Assessment of each tree involves a systematic search for Koala scats beneath the tree within a 1 m radius of the trunk. After approximately 2-minutes of searching for scats, the base of the trunk is observed for scratches and the crown for potential Koala presence. A total of three (3) SAT surveys were completed across 23 and 24 January 2020.

A Koala scat meander is a method used to identify a Koala habitat focal tree for use in a SAT survey. Each scat meander consists of searching for Koala scats under tree species likely to be utilised by Koalas. A search for Koala scats at the base of the tree is undertaken and where none are found the trunk is observed for scratches and the crown of the tree for potential Koalas present. If no scats, indicators of presence/utilisation or Koalas are observed, another nearby tree is chosen and the search is repeated. The process continues until a scat, indicator or Koala is found or 30-minutes has expired.

Refer to **Plan A15** for location of field surveys targeting Koala.

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

The SAT methodology is considered to be an accurate technique for estimating low-density Koala populations (Mossaz, 2010). Research by Rhodes et al. (2015) found Koala density in South East Queensland council areas (excluding areas inland of Ipswich) to be approximately 0.07 Koalas/ha based on data collected from 2005 - 2015. Therefore, the SAT survey methodology is considered to provide an accurate determination on Koala activity levels in South East Queensland.

g. Results of any surveys undertaken.

Spotlighting and RPA surveys

Contemporary field surveys identified two (2) Koalas within the referral area. Over the broader six (6) day survey period which incorporated diurnal habitat assessments, incidental observation and nocturnal spotlighting, a Koala was observed on a total of four (4) occasions (1 during diurnal surveys, 1 by spotlight, 2 by Remotely Piloted Aircraft (RPA)). For the two Koalas observed during spotlighting/RPA surveys it is difficult to discern whether these surveys identified the same or different Koala individuals therefore it is considered that there may be 1-2 Koalas utilising the referral area and surrounding habitat during the time of survey (September 2023) (refer **Plan A15**).

SAT surveys

SAT survey results are interpreted using the broad population categories provided in the Australian Koala Foundation Koala activity level classification table. These categories being 'East Coast (low)', 'East Coast (med-high)' and 'Western (med-high)' are shown in **Table A9** and are used to estimate Koala activity within a given area. Depending on the population category applied, Koala activity is described as 'low', 'moderate', or 'high'. Population categories are assigned as follows:

- Sites considered to be suitable or have high suitability for koalas are assigned the 'East Coast (med-high)' category;
- Sites considered to have low suitability are assigned the 'East Coast (low)' category; and
- The 'Western (med-high)' category does not apply to South East Queensland local government areas.

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

Activity	East Coast (low)	East Coast (med-high)	Western (med-high)
Low	<3.33%	<22.5%	<35.8
Moderate	3.33-12.6%	22.5-32.8%	35.8-46.7
High	>12.6%	>32.8	>46.7

It is considered that the referral area is most accurately described by the East Coast (med-high) population category for multiple reasons. The East Coast (med-high) activity thresholds are applicable in habitats dominated by residual, transferral or alluvial type landscapes considered med-high nutrient soils with good water holding capacity (Steve Phillips, personal communication). The ASRIS maps chromosols across the referral area and suit the landscape description outlined below (refer **Figure A6**). Chromosols are associated with the underlying Land Zone 9-10. Preferred habitat features are broadly present within the referral area which may indicate a higher expected density of Koalas. This includes the presence of riparian corridors and alluvial (fertile) soils and presence of preferred forage tree *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus propinqua* (Grey Gum), particularly within adjoining watercourses.

Description	Chromosols are texture-contrast soils. Extensive areas of Chromosols are in the Western Downs and the Maranoa districts—west of the Great Dividing Range.

Additionally, the estimated population density for RE12.9-10.2 is approximately 0.2 Koalas per hectare, as indicated in a Koala study completed in the Ipswich LGA (Bussey and Ellis, 2016). Phillips and Callaghan (2011) consider areas of with a density of >0.1 Koalas per hectare to qualify for the East Coast (med-high) category.

Table A10 presents the Koala usage scores for the three (3) SAT surveys completed. The relatively low levels of Koala usage at the site may be a result of major changes in the immediate landscape including the extension main roads and recent high density residential development.

As outlined above, contemporary surveys in September 2023 identified approximately two (2) Koalas within the site and surrounding habitat via RPA surveys (refer **Plan A15** and **Section 3.4.3** for further details).

Table A10: Summary of SAT Results

SAT Site Number	Evidence of Koala Use (%)	Koala Use (High/Medium/Low)
1	0.00%	Low
3	6.66 %	Low
5	0.00 %	Low

Incidental observations

Opportunistic searches for Koalas were also undertaken as part of the field survey effort. No Koalas were observed on the site during initial surveys in 2020; however, one (1) Koala individual was observed west of the site on the edge of Brookwater Golf Course during January 2021 bird surveys. The individual was identified as diseased and was subsequently rescued by the Moggill Koala Rehabilitation Centre for treatment.

A13. Impact Site Critical Koala Habitat



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Legend

- Qld DCDB
- Referral Area [18.9 ha]
- Koala Habitat On-site [18.9 ha]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

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Transverse Mercator | GDA 1994 | Zone 56 | 1:3,500 @ A3

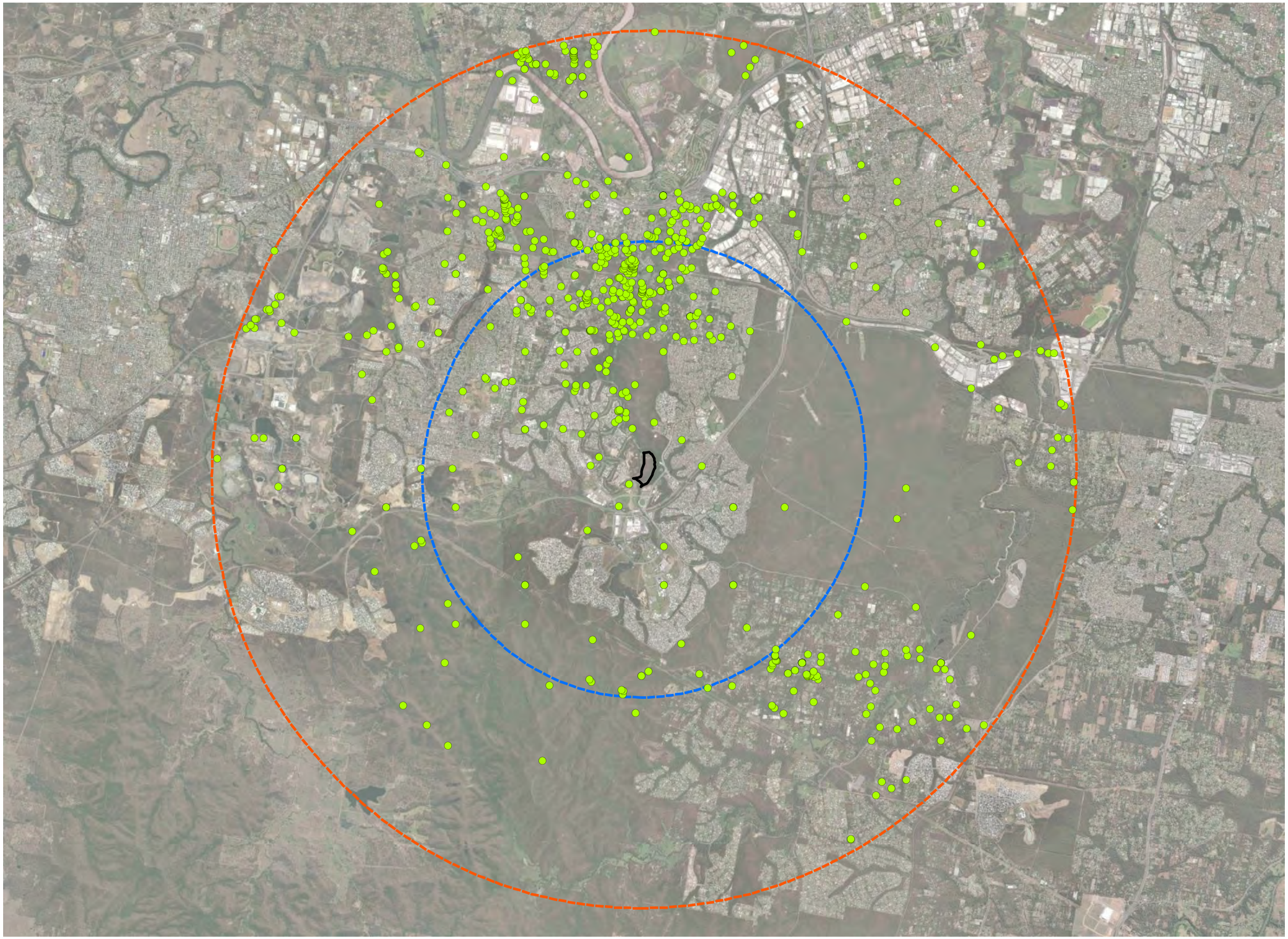
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A14. Koala Records (ALA, 2025)



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Legend

- Referral Area
- 5km Referral Area Buffer
- 10km Referral Area Buffer
- Koala records within 10km of referral area (ALA, 2025) [773]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 1 2 3 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:90,000 @ A3

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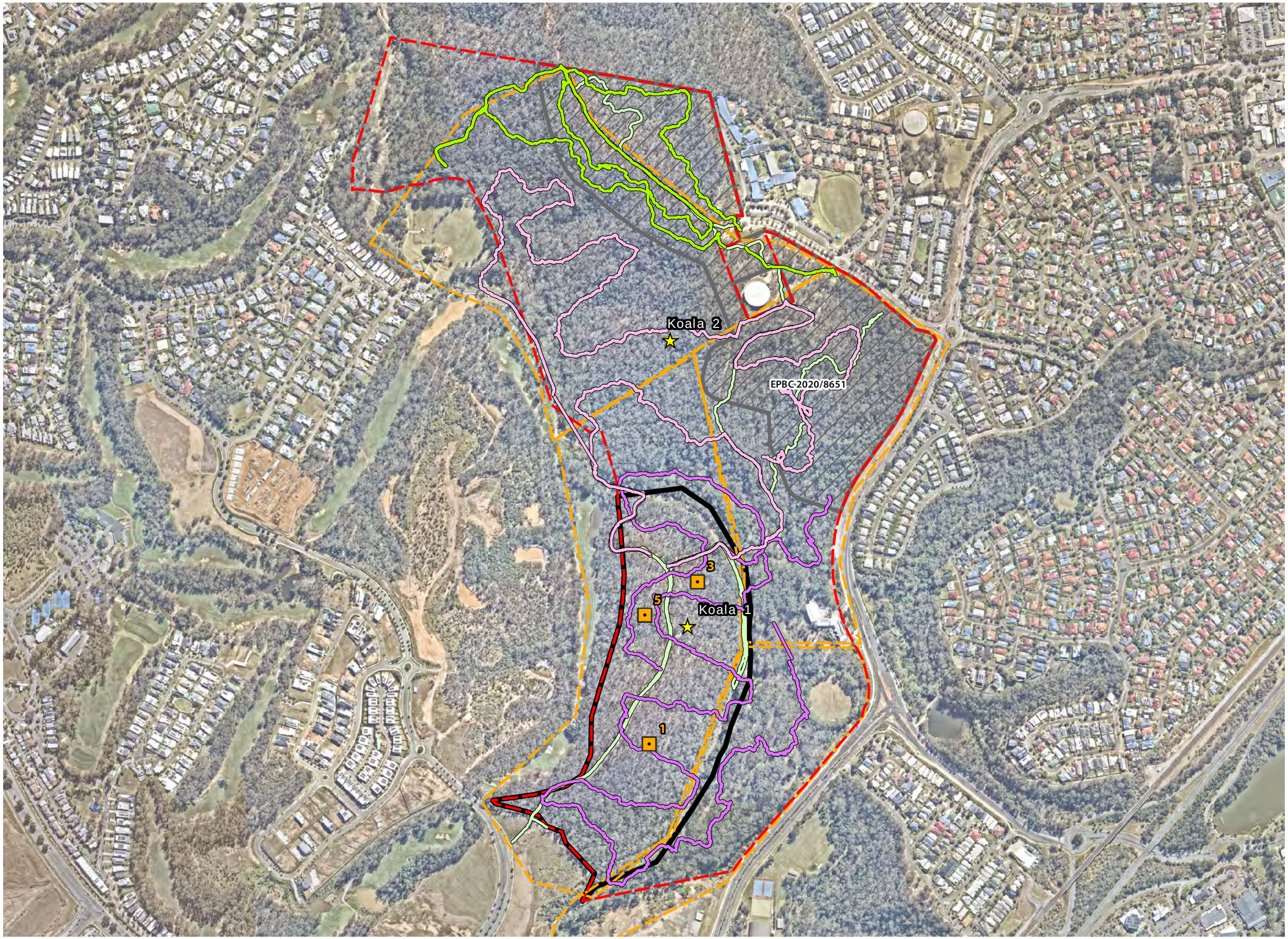
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18/08/2026 | 7399 E A14 Koala Records F

A15. Koala Survey Effort



Notes:
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Legend

- Referral Area
- SHG Survey Effort Extent
- RPA Survey Effort Extents
- Spotlighting (22/11/2022)
- Spotlighting (11/09/2023)
- Spotlighting (13/09/2023)
- Spotlighting (20/09/2023)
- Koala Observation
- SAT Survey Locations

Issue	Date	Description	Drawn	Checked
F	18/08/2026	Preliminary	HW	AW

0 50 100 150 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:7,500 @ A3

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18/08/2026 | 7399 E A15 Koala Survey Effort F

3.3.5 Grey Headed Flying-fox (*Pteropus poliocephalus*)

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

Distribution

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

Habitat and Ecology

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

b. Quantification of the extent of habitat and (if known) the number of individuals present, or historical patterns of use on, and surrounding, the development footprint (including maps identifying known or potential habitat.

South East Queensland has a permanent and abundant population of Grey-headed Flying-fox and available habitat is spread throughout the region given the high prevalence of eucalypt vegetation communities and protected areas. An area of 18.9 ha of remnant vegetation containing suitable habitat for the GHFF is present on-site within the impact area (refer **Plan A13**).

The closest Grey-headed Flying-fox camps to the project area are not of national significance exist approximately 3.6 km to the north-east, approximately 6.3 km to the north-west, approximately 8.9 km to the north-west and 12.5 km to the east, and approximately 5.5 km to the east of the project area (Camira, Barbara Street (140), Redbank – Pan Pacific Peace Garden (428), Bundamba, Paice St (574) and Parkinson, Avondale Crescent (419), respectively). One (1) nationally significant Flying-fox camp is located 12.5 km north of the site being Mount Ommaney – Westlake Drive (400) (refer **Plan A17**).

It is noted roost activity can change spatially and temporally and intermittent monitoring data provides an unclear picture of which roosts are currently active. The Interactive Flying-Fox Web Viewer which was intermittently updated with monitoring data from various roost sites was decommissioned on 25 June 2025. The location of the above identified roost sites is unlikely to reflect GHFF activity at all points in time, rather provides a broad area of known occurrence showing roost sites which are currently occupied, previously occupied or may be occupied again in the future.

A search of the ALA spatial portal returned 25 records for the species using a 5 km search radius from the site, and 691 records for the species using a 20 km radius of the site (refer **Plan A18**). The closest of the records to the site are located within the Springfield Lakes area. These records are distributed widely around

the site including throughout the suburbs of Camira, Redbank Plains and Springfield Central. Several of these records were made by the former Queensland Department of Environment and Resource Management, with one of the records cited by Queensland Parks and Wildlife Service.

Notably, during contemporary field surveys in September 2023, several Grey-headed Flying-fox individuals were observed within and surrounding the referral area feeding on flowering eucalypt trees.

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

South East Queensland 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. The habitat on-site did not contain any special or unique values. 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 associated with the Greenbank Military Base and White Rock Conservation Park located within the Flinders-Karawatha Corridor.

No camps or evidence of foraging was observed within the project area during extensive field surveys; however, food resources and foraging habitat occur within the referral area. Evidence of foraging was observed during contemporary surveys, with several Grey-headed Flying-fox individuals located feeding on flowering Eucalypt trees within the referral area and surrounding habitat.

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

A review of the grey-headed flying-fox population data available through the CSIRO Data Access Portal (McKeown and Vanderduys, 2024) indicates a total of 11 known roosting locations are present within a 20 km radius of the site which includes:

- Nationally Important Mount Ommaney, Westlake Drive (400)
- Camira, Barbara Street (140)
- Camira, Stephen Cook Memorial Park (1269)
- Bundamba, Paice Street (574)
- Parkinson, Avondale Crescent (419)
- Goleby Avenue, Queens Park (595)
- Yamanto (479)
- Woodend (191)
- Beryl Roberts Park, Coopers Plains (745)
- Sunnybank, Les Atkinson Park (452)
- Warana Court, Boronia Heights (848)

The closest Grey-headed Flying Fox camps to the project area are not of national significance and exist approximately 3.6 km to the north-east, approximately 6.3 km to the north-west, approximately 8.9 km to the north-west and 12.5 km to the east, and approximately 5.5 km to the east of the project area (Camira,

Barbara Street (140), Redbank – Pan Pacific Peace Garden (428), Bundamba, Paice St (574) and Parkinson, Avondale Crescent (419), respectively). Refer to **Plan A15** for active and inactive roost sites.

It is noted roost activity can change spatially and temporally and intermittent monitoring data provides an unclear picture of which roosts are currently active. The Interactive Flying-Fox Web Viewer which was intermittently updated with monitoring data from various roost sites was decommissioned on 25 June 2025. The location of the above identified roost sites is unlikely to reflect GHFF activity at all points in time, rather provides a broad area of known occurrence showing roost sites which are currently occupied, previously occupied or may be occupied again in the future.

Potential foraging trees are present on the subject site and alternative foraging habitat is freely available in the broader landscape. Primary foraging habitat within the broader landscape is associated with the Greenbank Military Base and White Rock Conservation Park located within the Flinders-Karawatha Corridor.

A search of the ALA spatial portal returned 25 records for the species using a 5 km search radius from the site, and 691 records for the species using a 20 km radius of the site (refer **Plan A18**). The closest of the records to the site are located within the Springfield Lakes area. These records are distributed widely around the site including throughout the suburbs of Camira, Redbank Plains and Springfield Central. Several of these records were made by the former Queensland Department of Environment and Resource Management, with one of the records cited by Queensland Parks and Wildlife Service.

e. *Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc) and search effort (e.g. 20 hours over 8 days).*

Targeted surveys for detection of Grey-headed Flying-fox were completed during spotlighting and RPA surveys on 11, 13 and 20 September 2023. Spotlighting surveys were conducted over three (3) nights in September 2023 for approximately 15 hours with two observers (refer **Plan A19**). In addition, aerial thermal wildlife surveys were conducted in conjunction with spotlighting using remotely piloted aircraft in order to detect cryptic nocturnal wildlife. Further detail of contemporary field survey effort is outlined in **Section 3.4.3.8**.

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

The survey methods were applied in accordance with the accepted methodologies detailed in the *Survey guidelines for Australia's threatened bats* which include diurnal searches for food trees and roosts and nocturnal surveys (spotlighting). The flying fox roost search was conducted during the day within the survey area, watching for flying foxes and listening for their distinctive calls as recommended by guidelines. This search is not only for flying fox camps, but the presence of food plants to assess the potential importance of the survey area to the species. This involved assessing tree canopies whilst completing meanders across the site. The search for flying fox roosts was justified due to the proximity of the site to an active flying fox camp located at Camira, Barbara Street, approximately 1.3 km north-east of the site.

a. Results of any surveys undertaken.

Diurnal surveys did not locate roosting sites in the referral area or within the immediate vicinity of the site.

Evidence of usage of the site by Grey-headed Flying-fox was not detected during initial field surveys in 2020 and 2021. Nocturnal field surveys completed in September 2023 identified Grey-headed Flying-fox individuals feeding on flowering eucalypt trees within the referral area and adjacent creek corridor.

A16. Impact Site Grey-headed Flying-fox Foraging Habitat



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Legend

- Qld DCDB
- Referral Area [18.9 ha]
- Grey-headed Flying-fox Foraging Habitat On-site [18.9 ha]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 25 50 75 100 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:3,500 @ A3

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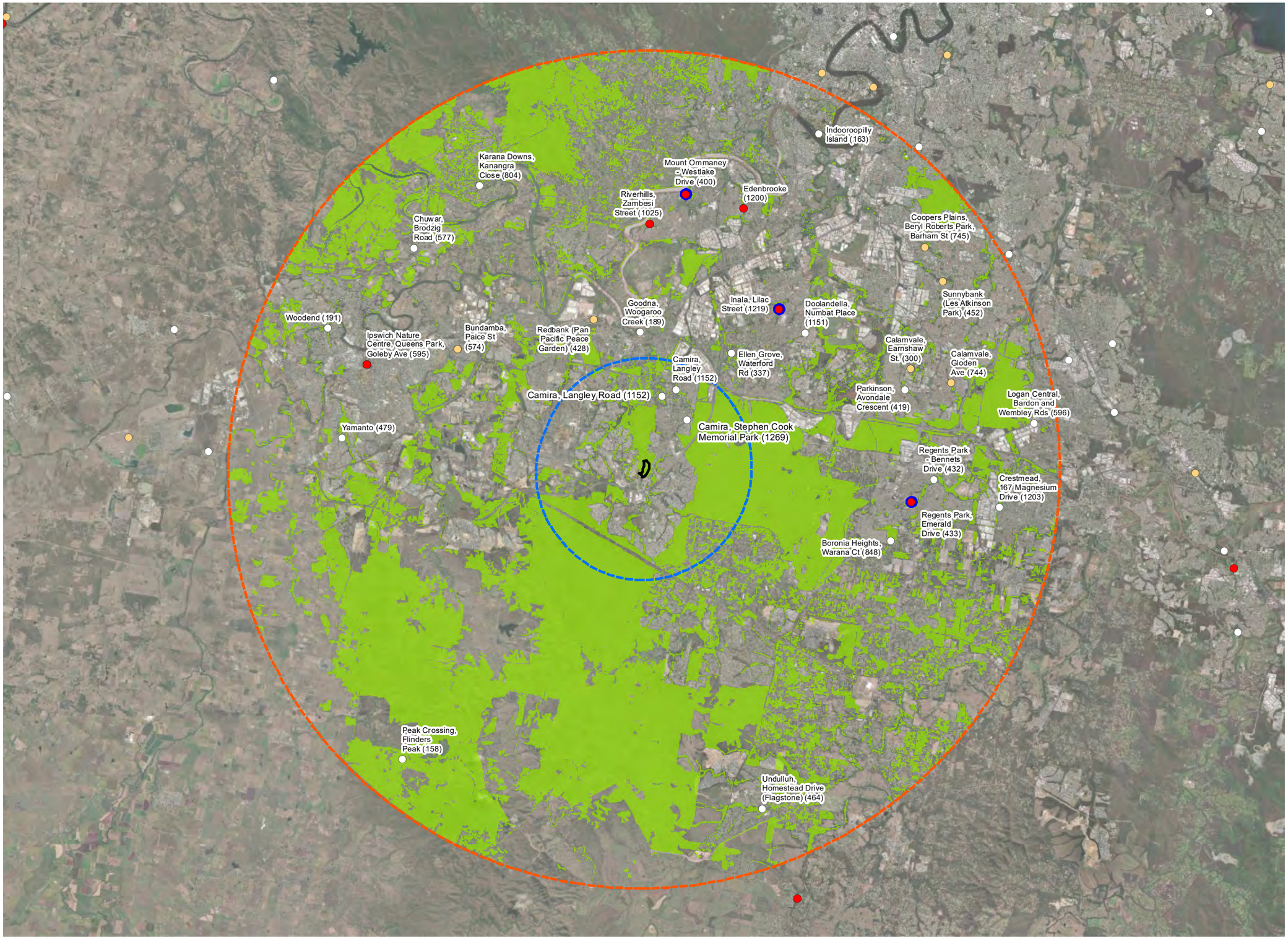
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18/08/2026 | 7399 E A16 Impact Site GHFF Habitat F

A17. Impact Site Grey-headed Flying-fox Context



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Legend

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Potential and known Grey-headed Flying-fox foraging habitat within 20km of referral area [33.8%]

Grey-headed Flying-fox Roosts (ALA, 2025)

- Grey-headed Flying-fox roost inactive within recent surveys [18 within 20km of referral area]
- Grey-headed Flying-fox roost active within recent surveys [6 within 20km of referral area]
- Grey-headed Flying-fox roost active within recent surveys with a population level of 3 or above [3 within 20km of referral area]
- Nationally significant Grey-headed Flying-fox roost active within recent surveys [0 within 20km of referral area]
- Nationally significant Grey-headed Flying-fox roost active within recent surveys with a population level of 3 or above [3 within 20km of referral area]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 1 2 3 4 5 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:185,000 @ A3

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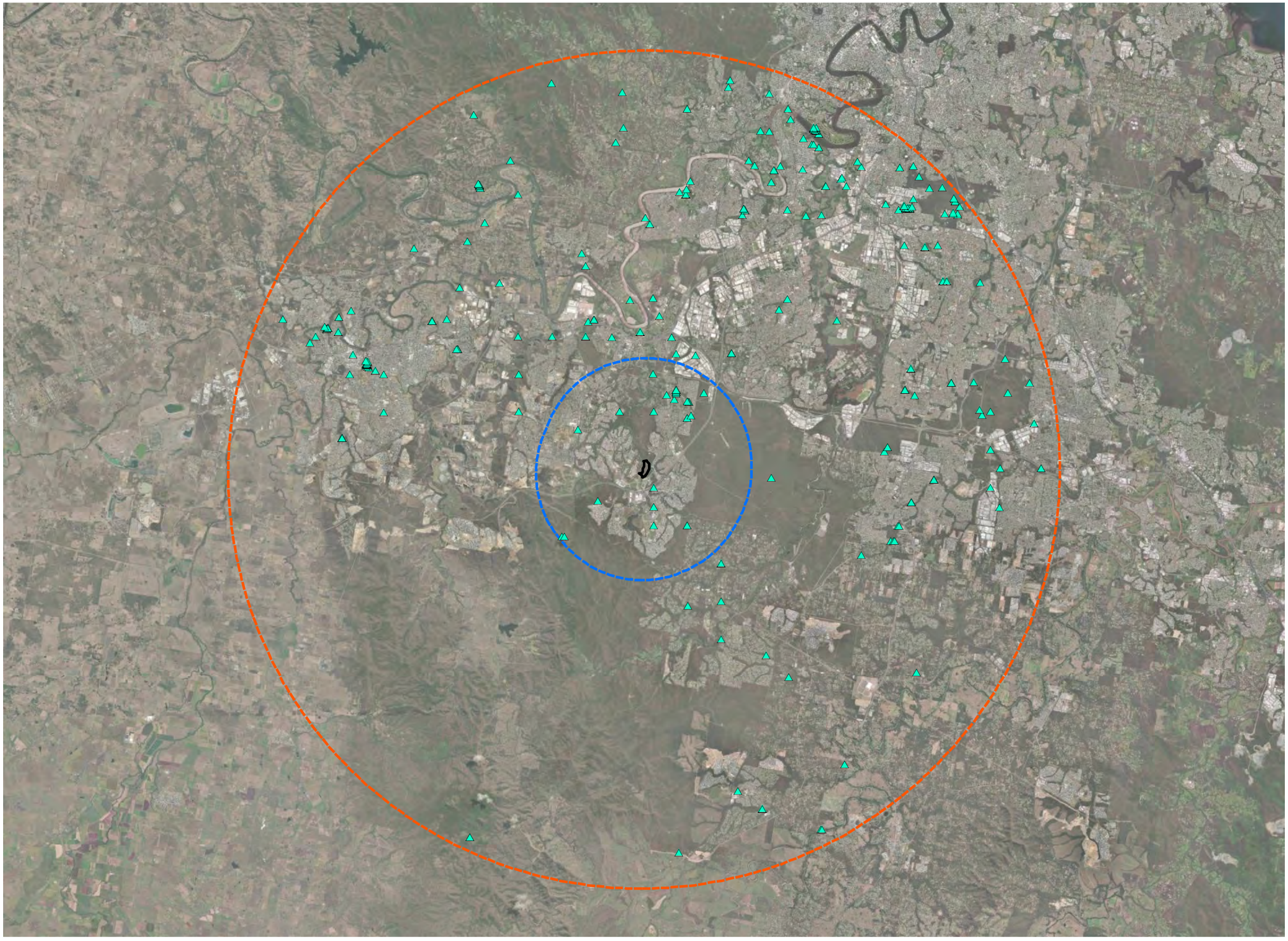
SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A17 Impact Site Grey-headed Flying Fox Context F

A18. Grey-headed Flying-fox Records (ALA, 2025)



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 Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

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Legend

- Referral Area
- 5km Referral Area Buffer
- 20km Referral Area Buffer
- Grey-headed Flying-fox record within 20km of referral area (ALA, 2025) [691]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 1 2 3 4 5 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:185,000 @ A3

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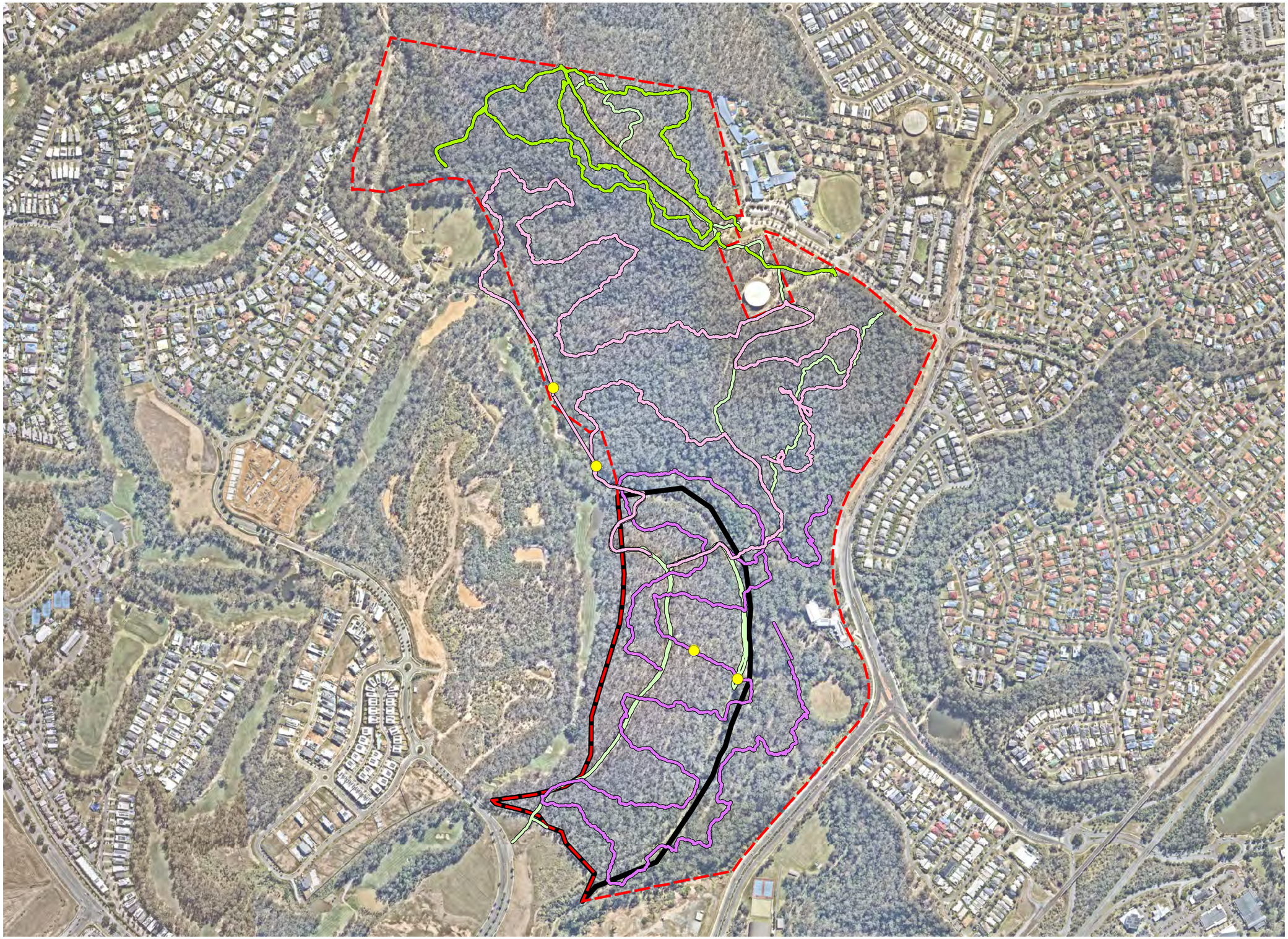
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Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A18 Grey-headed Flying Fox Records F

A19. Grey-headed Flying-fox Survey Effort



Notes:
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Legend

- Referral Area
- SHG Survey Effort Extent
- Spotlighting (22/11/2022)
- Spotlighting (11/09/2023)
- Spotlighting (13/09/2023)
- Spotlighting (20/09/2023)
- Grey-headed Flying-fox observed on-site

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 50 100 150 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:7,500 @ A3

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Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A19 GHFF Survey Effort F

3.3.6 Greater Glider (Petauroides volans)

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

Distribution

The Greater Glider is restricted to eastern Australia, occurring from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest), with an elevational range from sea level to 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 2006). Studies also suggest that the number of Greater Gliders decline with an increase in percentage of land cleared within 1 km (Eyre 2006).

b. Quantification of the extent of habitat and (if known) the number of individuals present, or historical patterns of use on, and surrounding, the development footprint (including maps identifying known or potential habitat.

The site is located within a large, fragmented patch of remnant eucalypt vegetation located in the emerging and well-established City of Springfield. The action proposes medium and standard density residential development being adjacent to the City Centre, schools, train station, other critical infrastructure and amenities. At the regional scale, the area is not included in any State mapped ecological corridors under the *ShapingSEQ 2017* and therefore is not supported by ecological land uses for broader connectivity. Locally, the vegetation on-site retains a degree of landscape connection as set out in the open space provisions of the Springfield Structure Plan including areas like the Brookwater Golf Course and adjoining creek corridors including O'Dwyer's Gully, Opossum Creek and Woogaroo Creek. The connecting areas are predominantly

comprised of lineal strands of retained vegetation, trees in parkland settings, newly rehabilitated vegetation which limit movement and persistence opportunities of the disturbance-sensitive Greater Glider.

Where connected lineal vegetation appears to occur within identified linkages to the proposed action site, area plans in this submission show corridors are a mix of non-remnant, regrowth or remnant vegetation mapped under the *Vegetation Management Act 1999* and vary in width from 15 m at the narrowest points up to 100 m in less disturbed areas (refer **Plan A20**). Corridor linkages are intersected and severed at multiple locations by major infrastructure including the Springfield Line rail corridor and major or minor roads, with the most significant of these being the Centenary Highway (refer **Plan A21**).

Vegetation within the referral area is mapped as remnant vegetation dominated by species of the genus *Corymbia* and *Eucalyptus*. Specifically, these species included *Corymbia citriodora* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus acmenoides* (White Mahogany). This vegetation was determined to consist of one (1) vegetation community, defined as RE12.9-10.2. Suitable woodland habitat also extends into the north-west and southern adjoining lots; however, these are earmarked for development.

Greater Glider records available on public databases (*i.e.,* Atlas of Living Australia) within the past 5 to 10 years are almost exclusively located within large, connected tracts of remnant bushland, near or with direct connectivity to State Government Protected Estates and National Parks (refer **Plan A22**). The exception to this is a record recently published in late 2024 (dated August 2023) shown as occurring on the First Nine Project site which was cleared in accordance with EPBC 2016/7676 in 2020. The validity of the record was queried with ALA and iNaturalist who confirmed the original coordinate was obfuscated due to its sensitive nature. The publicly available positional accuracy was increased to a 0.2 x 0.2 degree cell (29 km area) and the coordinate was replaced with a random point within that cell. The ungeneralised coordinate was provided which confirmed its location within White Rock Conservation Park. Historical records (*i.e.,* pre-2000) are present surrounding the site; however, these records are reflective of a time when the surrounding landscape was predominantly vegetated and well-connected.

Long-term and extensive establishment of housing and supporting infrastructure results in the vegetation patch as being functionally disconnected from the contiguous conservation areas within the locality including the White Rock Conservation Park and Flinders-Karawatha Bioregional Corridor. Under the *Vegetation Management Action 1999*, remnant and regrowth mapped vegetation, used as an indicator of tree age and maturity, within the landscape is reduced to fragments, isolated patches or linear strands which do not connect into the larger tracts of surrounding bushland and remain severed by significant infrastructure (refer **Plan A21**).

Delineating the extent of potential habitat for the Greater Glider in Queensland is dependent on a number of habitat factors including the presence of suitable regional ecosystems, confirmed records, live and dead hollow-bearing trees for denning and habitat connectivity (Eyre et al. 2022). Greater Glider suitable regional ecosystems identified by Eyre et al. (2022) are highly fragmented within the surrounding landscape and are restricted to narrow, linear corridors adjoined by urban environments (refer **Plan A23**). Integrating the other habitat factors listed above, it is likely that the potential habitat for Greater Glider is less extensive than that

shown on **Plan A23** which is based on the location of suitable regional ecosystems alone. The vegetation on-site while mapped as remnant vegetation under the VMA, has been historically disturbed through logging and as a result, lacks the density of large, old growth habitat trees required to support the Greater Glider, with a dominance of small hollows (0-100 mm entry hole). The former timber harvesting use of the entire Springfield Structure Plan Area is reflected in the Griffith University assessment of mature vegetation age (Norma & Mackey, 2024) (refer **Plan A24**) which identifies the vegetation patch as predominantly 'Young to intermediate Age.'

Using contemporary aerial photography and knowledge of the local area, four (4) potential linkage corridors of connected vegetation have been explored for the potential of supporting Greater Glider movement (refer plan series at **Attachment A6**). A detailed review of these corridors is provided in **Attachment A6** which highlights and describes each major barrier and pinch points within each corridor. This includes main roads (Centenary Highway, Brookwater Drive, Eden Station Drive and Springfield Greenbank Arterial Road), Springfield Anglican College and residential areas.

The Conservation Advice for the *Petauroides volans* (greater glider (southern and central) – July 5, 2022, notes that '*Greater gliders disperse poorly across vegetation that is not native forest and so do not readily recolonise isolated sites*.' The land on which the project occurs has been subjected to extensive ecological survey by numerous ecological experts and has not been recorded as supporting the greater glider species. Records of expanding development zones over the past 8 years in Springfield support this finding, with the land providing only marginal aspects of greater glider habitat definitions based on the premise of one day being considered suitable to support the species. For greater gliders to utilise the proposed action site it is considered that recolonisation would need to occur from nearby unconnected Protected Estates and National Parks which would require the species to navigate unconnected fragments of immature vegetation, cross multiple major infrastructure corridors, navigate narrow (15 m) compromised pinch points directly adjacent to housing and roads to ultimately persist in an environment of ever-expanding city infrastructure and housing.

Additionally, Fauna Spotter Catcher data has been collated across a large portion of Greater Springfield. The Greater Glider has never been recorded in any detailed pre- or post-clearance fauna surveys undertaken through the surrounding Springfield City developments, including Springfield Rise (EPBC 2013/7057), Kalina (EPBC 2014/7306), Woogaroo Heights (EPBC 2017/7875) and Brookwater (EPBC 2016/7676) (refer **Attachment A6** for further details). This includes detailed pre-clearance fauna surveys undertaken over much larger approved development areas pre-, during and post-clearing totalling 222 days between July 2017 and November 2021. Notably, the Fauna Spotter Catcher data analysed relates to clearing events that were undertaken when Springfield was much more connected.

Based on this analysis, it is considered unlikely that recolonisation of this area of bushland would occur.

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

Approximately 18.9 ha of the site contains remnant eucalypt open forest with a diversity of eucalypt species. However, the site is not considered to be a tall, montane moist eucalypt forest preferred by the species. The

site contains some large trees (> 460 mm DBH), however, field surveys identified relatively few hollows suitable for Greater Glider denning with > 100 mm diameter (approximately 31 hollow-bearing trees within the project site) (refer **Plan A15**). The majority of the hollows found within the referral area were small in size (0 – 100 mm) while only fifteen (15) hollows were > 100 mm (refer **Plan A16**). Suitable hollows and large trees were found in higher abundance through the Opossum Creek waterway corridor to the west and south of the project area, which is proposed for retention although already compromised be existing development. Opossum Creek adjoins the site to the west and is proposed to be retained within the landscape. It is noted existing disturbance and development to the west already compromises this habitat value. These areas contain patches of historic mature plantation of *Eucalyptus grandis* (Flooded Gum) species throughout the creek line.

The site has been subject to disturbance from historic clearing, vehicle use and fire damage which are known deterrents to the species. Some larger trees and hollow-bearing trees are present within the referral area, which are required by the species for breeding and shelter. The site is substantially fragmented from surrounding Greater Glider habitat with limited connectivity to larger tracts of bushland such as White Rock Conservation Park which aligns with nearby recent records (refer **Plan A22**). Furthermore, the site is surrounded by urban areas inclusive of roads, schools and residential houses, this presents significant noise interference into the project site which is a likely deterrent to the species.

As mentioned previously**,** movement into the referral area vegetation from these known habitats is highly limited for this species and is considered functionally disconnected. Given the current and proposed development surrounding the referral area, with the landscape largely fragmented between areas where records are found and the project site, there is a level of uncertainty as to whether recolonisation of the site would ever occur.

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

Contiguous vegetation areas known to support the greater Glider are present within 5 km of the site outside of the urban landscape in which in the site is located. Greater Gliders are known to occur within nearby contiguous vegetation areas including Greenbank Military Training Area located approximately 2.3 km east of the site and within White Rock Conservation Park are located 3.6 km south-west of the site (refer **Plan A22**). The size of the population is not known. Historical records (*i.e.,* pre-2000) are present surrounding the site; however, these records are reflective of a time when the surrounding landscape was predominantly vegetated and well-connected.

e. Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc) and search effort (e.g. 20 hours over 8 days).

Field surveys completed were a combination of targeted spotlighting and wildlife aerial surveys, and diurnal habitat assessments.

Greater Glider targeted detection surveys were conducted for a period three (3) nights 11, 13, and 20 September (spring) (refer **Plan A27**). Targeted Greater Glider surveys involved spotlighting on-foot by two (2) SHG ecologists for approximately 15 hours across the entire Peninsula and Scenic Project areas and Opossum Creek habitat corridor completed in accordance with recommended survey guidelines (refer **Plan A27**). During two (2) of the three (3) nights of spotlighting, targeted Wildlife Aerial Thermal surveys were also conducted simultaneously by two (2) SHG mapping personnel. These surveys involved using RPA (remotely piloted aircraft) equipped with a thermal sensor to detect the presence of Greater Glider within the referral area. The methodology and findings of the wildlife aerial thermal surveys are provided in **Attachment A5**.

Diurnal habitat assessment surveys were completed on 7, 8 and 18 September 2023 (spring). Habitat assessment surveys included the identification of all trees containing hollows and all trees with DBH > 460 mm (refer **Plan A25**). 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 DBH were GPS located across the referral area and within a broader survey area of 88.6 ha incorporating the retained Opossum Creek corridor. The threshold of 460 mm was used to account for the average large tree benchmark for Queensland Greater Glider Regional Ecosystems used by 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).

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

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 surveys for presence completed in September 2023 did not detect the species.

Species-specific field surveys for determining species presence and habitat suitable for the Greater Glider were undertaken over a 15-hour period during September 2023. The surveys included identification of large hollow bearing trees and spotlighting transects covering the entire site. The diurnal hollow surveys were completed on 7 – 8 September and 18 September 2023. In addition, spotlighting surveys were completed on 11, 13 and 20 September. 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 typically applied prior to logging and are considered adequate to detect presence of the species. It is noted the Victorian method standard is designed for large areas of forest to support forestry activities; therefore, the method has been scaled down to suit the smaller project area and is considered suitable in the survey effort applied.

Targeted Wildlife Aerial Thermal surveys were also conducted simultaneously by SHG mapping personnel with observations verified on-ground by SHG ecologists. These surveys involved using RPA (remotely

piloted aircraft) equipped with a thermal sensor to detect the presence of greater glider within and adjoining the referral area. Thermal drone surveys are becoming an increasingly used method for detecting greater glider, with recent studies demonstrating detection rates comparable to traditional spotlighting and, in some cases, improved ability to identify individuals across larger and less accessible areas (Wagner et al. 2025; Vinson et al. 2020). Thermal surveys are particularly effective for detecting low-density or widely dispersed populations and can complement ground-based methods by increasing overall survey coverage and reducing the likelihood of false absences (Wagner et al. 2025). However, consistent with current best practice and survey guidance, no single survey technique is considered sufficient in isolation due to inherent detection limitations associated with each method (e.g. canopy obstruction, observer bias, and environmental conditions) (Vinson et al. 2020; Commonwealth of Australia 2013). Accordingly, the combination of best practice survey approaches utilised including thermal drone surveys and spotlighting is considered suitable to detect the species.

For spotlighting, the requirement to cover a total distance of as close to 1 km as possible per transect was targeted at a pace of 10 minutes per 100 m, as outlined within The Department of Environment, Land, Water and Planning Forest Protection Survey Program *Survey Guideline – Spotlighting and Call Playback* (2020) (version 4.1) and Conservation Regulator Victoria *Guidance Note: Reporting detections of Greater Gliders* (2021). Multiple transects were conducted 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. 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 within and adjoining the site was 10.19 km across two nights with a survey effort of approximately 450 minutes (refer **Table A11**). 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 1019 minutes for 10.19 km), it is considered that 10.19 km survey effort was adequate to identify the presence / absence of Greater Glider across the site and surrounding vegetation given the scale of the survey area. Furthermore, as two observers surveyed the site the total duration of surveys is 900-person minutes in accordance with *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (2022) which is considered to be adequate to detect the presence of Greater Glider onsite.

In addition, two observers surveyed the referral area and surrounding Opossum Creek on three (3) 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) on two occasions and once 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 Greater 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, supporting a low likelihood the species is present within the referral area.

Table A11: Greater Glider Survey Guidelines compared to SHG Survey Effort

Transect	Date	Time	Duration	Observers	Distance
Transect 1	11 September 2023	18:30 – 21:00	150 minutes	Two (300-person minutes)	3.47 km
Transect 2	11 September 2023	21:00 – 21:30	30 minutes	Two (60-person minutes	0.25 km
Transect 3	20 September 2023	18:00 – 19:30	90 minutes	Two (180-person minutes)	1.81 km
Transect 4	20 September 2023	20:00 – 23:00	180 minutes	Two (360-person minutes	4.66 km
Total	N /A	N/A	450 minutes		10.19 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

g. Results of any surveys undertaken.

Greater Glider Habitat Assessment

A total of 132 potential habitat trees were recorded in the Peninsula Precinct project area, while 629 were recorded through the broader survey area (refer **Table A12**). Within the survey area, *Eucalyptus crebra* (Narrow-leaved Ironbark) dominated the habitat tree plot with 222 trees recorded (35.29%). Notably, large patches of *Eucalyptus grandis* (Flooded Gum) plantation are present within the creek corridor.

The majority of habitat and hollow-bearing trees within the survey area had a DBH between 400 and 600 mm (54.45%), refer **Table A13**, with the balance ranging from 600 to 1100 mm DBH. A total of 56 hollows were found within the Peninsula Precinct referral area (refer **Table A14**) with the majority (43) of these representing small hollows (0 – 100mm). Trees identified to contain hollows within the Peninsula Precinct referral area and broader survey area are shown on **Plan A25** with a breakdown of hollow counts shown on **Plan A26**.

Table A12: Habitat and Hollow Tree Plot Summary within survey area

Scientific Name	Common Name	Number Recorded	Percentage Recorded (%)
Angophora leiocarpa	Small Barked Apple	3	0.48%
Angophora melanoxylon	Coolabah Apple	1	0.16%
Angophora subvelutina	Broad-leaved Apple	2	0.32%
Cinnamomum camphora	Camphor Laurel	1	0.16%
Corymbia citriodora	Spotted Gum	40	6.36%
Corymbia intermedia	Pink Bloodwood	3	0.48%
Corymbia tessellaris	Moreton-Bay Ash	1	0.16%
DEAD/STAG	N/A	17	2.70%
Eucalyptus acmenoides	White Mahogany	5	0.79%
Eucalyptus crebra	Narrow-Leaved Ironbark	222	35.29%
Eucalyptus fibrosa	Broad-Leaved Ironbark	66	10.49%
Eucalyptus grandis	Flooded Gum	107	17.01%
Eucalyptus major	Grey Gum	2	0.32%
Eucalyptus microcorys	Tallowwood	13	2.07%
Eucalyptus moluccana	Gum-topped Box	55	8.74%
Eucalyptus propinqua	Small-fruited Grey Gum	1	0.16%
Eucalyptus robusta	Swamp Mahogany	5	0.79%
Eucalyptus siderophloia	Broad-leaved Ironbark	57	9.06%
Eucalyptus tereticornis	Forest Red Gum	23	3.66%
Lophostemon confertus	Brush Box	2	0.32%
Lophostemon suaveolens	Swamp Box	2	0.32%
Celtis sinensis	Chinese Elm	1	0.16%
TOTAL		**629**	**100%**

Table A13: Number of hollow bearing trees with DBH summary within survey area

Total DBH (mm)	Number Recorded	Percentage Recorded (%)
400-500	17	16.83%
500-600	38	37.62%
600-700	25	24.75%
700-800	14	13.86%
800-900	5	4.95%
900-1000	1	0.99%
1000-1100	1	0.99%

Total DBH (mm)	Number Recorded	Percentage Recorded (%)
TOTAL	**101**	**100%**

Table A14: Size of hollows identified during Hollow-bearing Tree Plot

Hollow Type	Peninsula Referral Area	Survey Area Total
Small Hollows 0 – 100mm	29	130
Medium Hollows 100 – 300mm	11	56
Large Hollows > 300mm	3	16
TOTAL	**43**	**202**

Spotlighting and RPA Surveys

Targeted Greater Glider surveys involved spotlighting on-foot by two (2) SHG ecologists for approximately 15 two person hours across the entire Peninsula Project area and Opossum Creek habitat corridor (refer **Plan A27**). During two (2) of the three (3) nights of spotlighting, targeted Wildlife Aerial Thermal surveys were conducted simultaneously by two (2) SHG mapping personnel. These surveys involved using RPA (remotely piloted aircraft) equipped with a thermal sensor to detect the presence of Greater Glider within the referral area. The methodology and findings of the wildlife aerial thermal surveys are provided in **Attachment A5**. Results of fauna spotlighting surveys are presented in **Table A15** below. Surveys did not detect the presence of Greater Glider within the project impact area or the habitat corridor west and south of the impact. Numerous native fauna species were detected along with one (1) introduced species, *Rhinella marina* (Cane Toad). Common Brushtail Possum (*Trichosurus vulpecula*) were also observed which may compete for Greater Glider for hollows.

Table A15: Contemporary Field Survey Effort Fauna Detected

Scientific Name	Common name	Conservation Status	Taxa	Native/ Introduced	Count	Location
Diurnal Habitat Assessment Fauna Species 07.09.2023						
Phascolarctos cinereus	Koala	*Vulnerable*	Mammal	Native	1	Peninsula Precinct
Macropus giganteus	Eastern Grey Kangaroo	*Least Concern*	Mammal	Native	2	Peninsula Precinct
Varanus varius	Lace Monitor	*Least Concern*	Reptile	Native	1	Peninsula Precinct
Spotlight Night 1 Fauna Species 11.09.2023						
Cracticus torquatus	Grey Butcherbird	*Least Concern*	Bird	Native	1	Scenic Precinct
Megalurus timoriensis	Tawny Grassbird	*Least Concern*	Bird	Native	1	Scenic Precinct

Scientific Name	Common name	Conservation Status	Taxa	Native/ Introduced	Count	Location
Strepera graculina	Pied Currawong	*Least Concern*	Bird	Native	3	Scenic Precinct
Macropus giganteus	Eastern Grey Kangaroo	*Least Concern*	Mammal	Native	1	Scenic Precinct
Trichosurus vulpecula	Common Brushtail Possum	*Least Concern*	Mammal	Native	2	North-western habitat corridor
Spotlight Night 2 Fauna Species 13.09.2023						
Cacatua galerita	Sulphur-crested Cockatoo	*Least Concern*	Bird	Native	2	South-eastern habitat corridor
Cracticus torquatus	Grey Butcherbird	*Least Concern*	Bird	Native	2	South-eastern habitat corridor
Podargus strigoides	Tawny Frogmouth	*Least Concern*	Bird	Native	1	Peninsula Precinct
Macropus giganteus	Eastern Grey Kangaroo	*Least Concern*	Mammal	Native	2	Eastern habitat corridor
Macropus parryi	Whiptail Wallaby	*Least Concern*	Mammal	Native	5	Peninsula Precinct /Eastern habitat corridor
Phascolarctos cinereus	Koala	*Vulnerable*	Mammal	Native	2 (1 by spotlight, 1 by RPA)	Eastern habitat corridor, Peninsula
Pteropus poliocephalus	Grey-headed Flying-fox	*Vulnerable*	Mammal	Native	3	Peninsula Precinct
Trichosurus vulpecula	Common Brushtail Possum	*Least Concern*	Mammal	Native	2	Peninsula Precinct
Spotlight Night 3 Fauna Species 20.09.2023						
Adelotus brevis	Tusked Frog	*Vulnerable (QLD)*	Amphibian	Native	1	Central waterway / habitat corridor
Rhinella marina	Cane Toad	N/A	Amphibian	Introduced	5	Scenic Precinct / habitat corridor
Corvus orru	Torresian Crow	*Least Concern (QLD)*	Bird	Native	2 (RPA)	Scenic Precinct / habitat corridor
Dacelo novaeguineae	Kookuburra	*Least Concern*	Bird	Native	2	North-western habitat corridor
Podargus strigoides	Tawny Frogmouth	*Least Concern*	Bird	Native	1	Scenic Precinct
Trichoglossus moluccanus	Rainbow Lorikeet	*Least Concern (QLD)*	Bird	Native	2 (RPA)	Scenic Precinct / habitat corridor
Isoodon macrourus	Northern Brown Bandicoot	*Least Concern*	Mammal	Native	1	North-western habitat corridor
Petaurus breviceps	Sugar Glider	*Least Concern*	Mammal	Native	1	North-western habitat corridor

Scientific Name	Common name	Conservation Status	Taxa	Native/ Introduced	Count	Location
Phascolarctos cinereus	Koala	*Vulnerable*	Mammal	Native	1 (RPA)	Central habitat corridor
Pseudocheirus peregrinus	Common Ringtail Possum	*Least Concern*	Mammal	Native	3	North-western waterway / habitat corridor
Pteropus poliocephalus	Grey-headed Flying-fox	*Vulnerable*	Mammal	Native	7 (5 by spotlight, 2 by RPA)	North-western habitat corridor
Trichosurus cunninghami	Mountain Brushtail Possum	*Least Concern*	Mammal	Native	1	Central waterway / habitat corridor
Trichosurus vulpecula	Common Brushtail Possum	*Least Concern*	Mammal	Native	4	Scenic Precinct / habitat corridor

A20. Queensland Vegetation Mapping



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Legend

- Referral Area

Regulated Vegetation

- Category A area - *Vegetation Offset/Compliance notices/VDecs*
- Category B area - *Remnant vegetation*
- Category C area - *High value regrowth vegetation*
- Category R area - *Reef regrowth watercourse vegetation*
- Category X area - *Vegetation not regulated under the VMA*
- Water
- Area not categorised

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 200 400 600 800 1,000 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:25,000 @ A3

Address / RPD: 163/SP291400

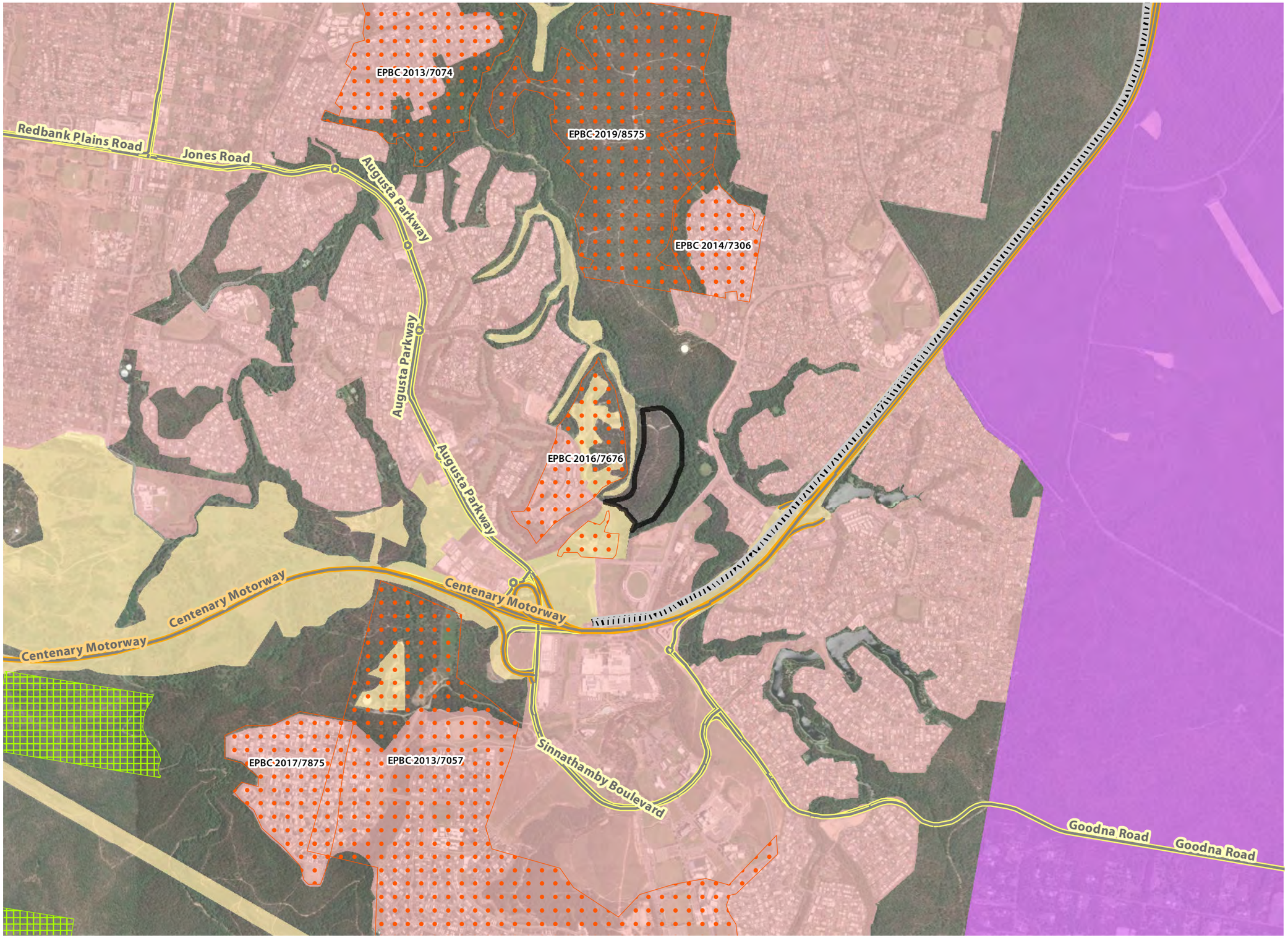
18/08/2026 | 7399 E A20 Qld Vegetation Mapping F

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A21. Barrier Analysis



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Legend

- Referral Area
- White Rock Conservation Park

Barriers

- EPBC Referral Areas
- Greenbank Military Training Area
- Established residential/industrial uses
- Cleared land
- Rail network
- Highway or 4-lane arterial road
- Major roads

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 200 400 600 800 1,000 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:25,000 @ A3

Address / RPD: 163/SP291400

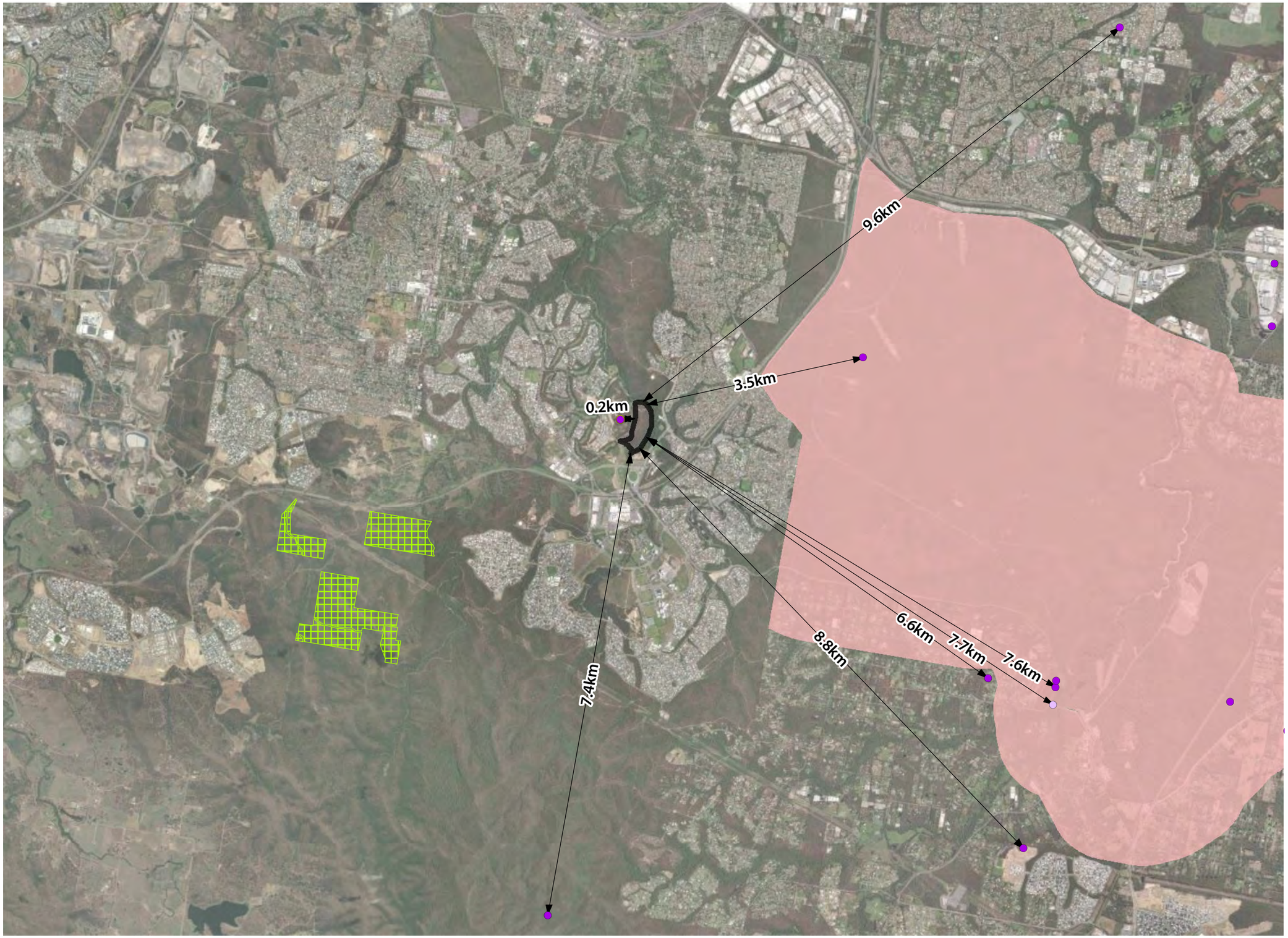
18/08/2026 | 7399 E A21 Barrier Analysis F

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A22. Greater Glider records



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Legend

- Referral Area
- White Rock Conservation Park
- Greenbank Military Training Area

Greater Glider Records (ALA, 2025)

- Greater Glider records recorded 10-20 years ago (ALA, 2025) - 0
- Greater Glider records recorded 5-10 years ago (ALA, 2025) - 1
- Greater Glider records recorded within the past 5 years (ALA, 2025) - 9
- Greater glider record recorded in active construction site dated August 2023. The record was queried with ALA who confirmed the original record was obfuscated to the current position due to its sensitive nature.
- Distance to Greater Glider records

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 500 1,000 1,500 2,000 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:60,000 @ A3

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A22 GG Records F

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A23. Greater Glider suitable regional ecosystems



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Legend

- Qld DCDB
- Referral Area
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders (Eyre et al. 2022) on-site - 18.9 ha
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders (Eyre et al. 2022).

Citation: Eyre T.J., Smith G.C., Venz M.F., Mathieson M.T., Hogan L.D., Starr, C., Winter, J. and McDonald, K. 2022. Guide to greater glider habitat in Queensland, report prepared for the Department of Agriculture, Water and the Environment, Canberra. Department of Environment and Science, Queensland Government. Brisbane. Guide to greater glider habitat in Queensland – DCCEEW.

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 20 40 60 80 100 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:3,500 @ A3

Address / RPD: 163/SP291400

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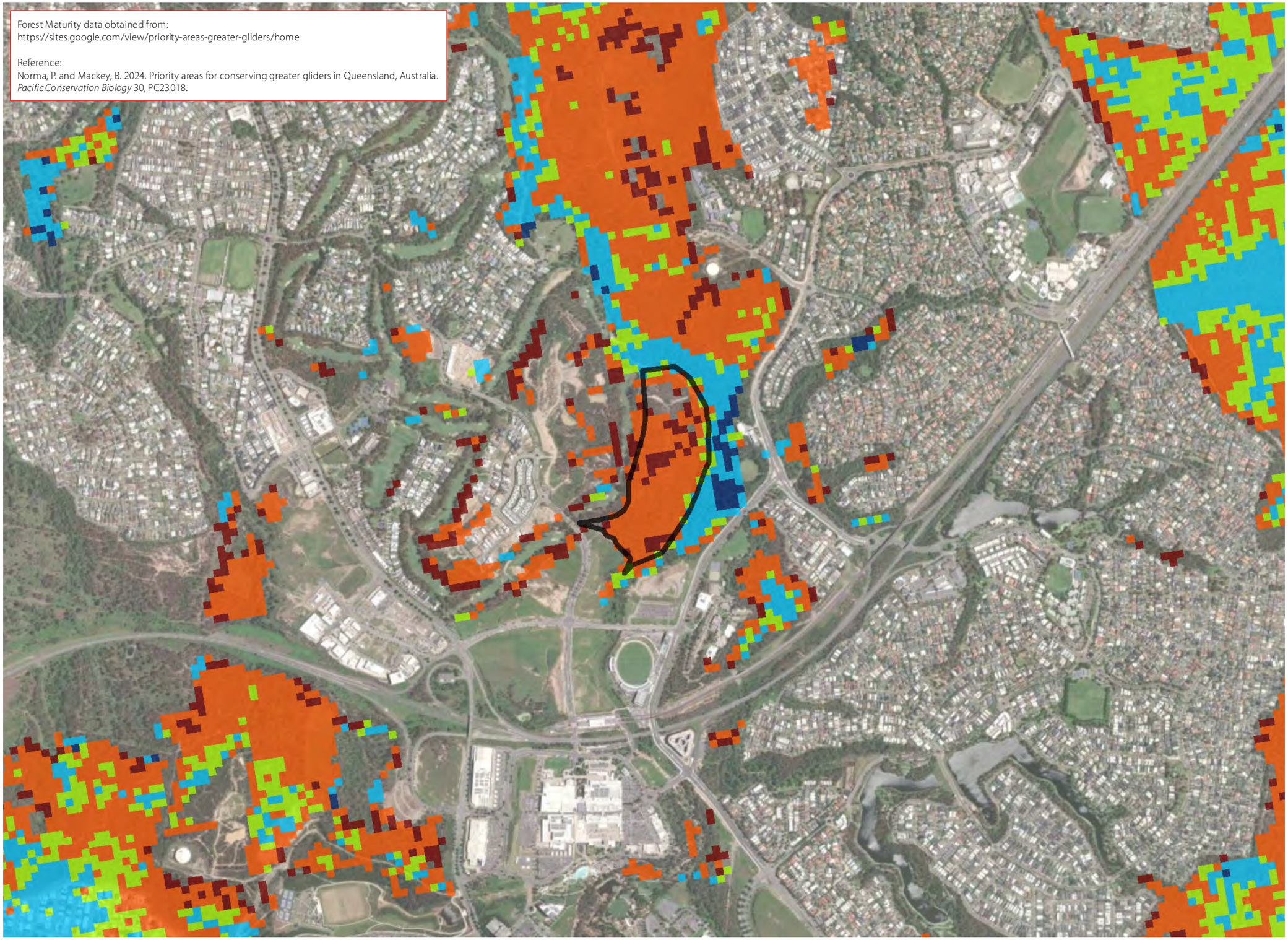
Peninsula Precinct

18/08/2026 | 7399 E A23 Greater Glider Suitable REs F

A24. Forest Maturity Map (Griffi th University)

Forest Maturity data obtained from:
https://sites.google.com/view/priority-areas-greater-gliders/home

Reference:
Norma, P. and Mackey, B. 2024. Priority areas for conserving greater gliders in Queensland, Australia. *Pacific Conservation Biology* 30, PC23018.



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Legend

- Referral Area

Forest Maturity Map

- Mature Vegetation
- Intermediate to Mature Aged Vegetation
- Intermediate Aged Vegetation
- Young to Intermediate Aged Vegetation
- Young Vegetation

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 100 200 300 400 500 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:15,000 @ A3

Address / RPD: 163/SP291400

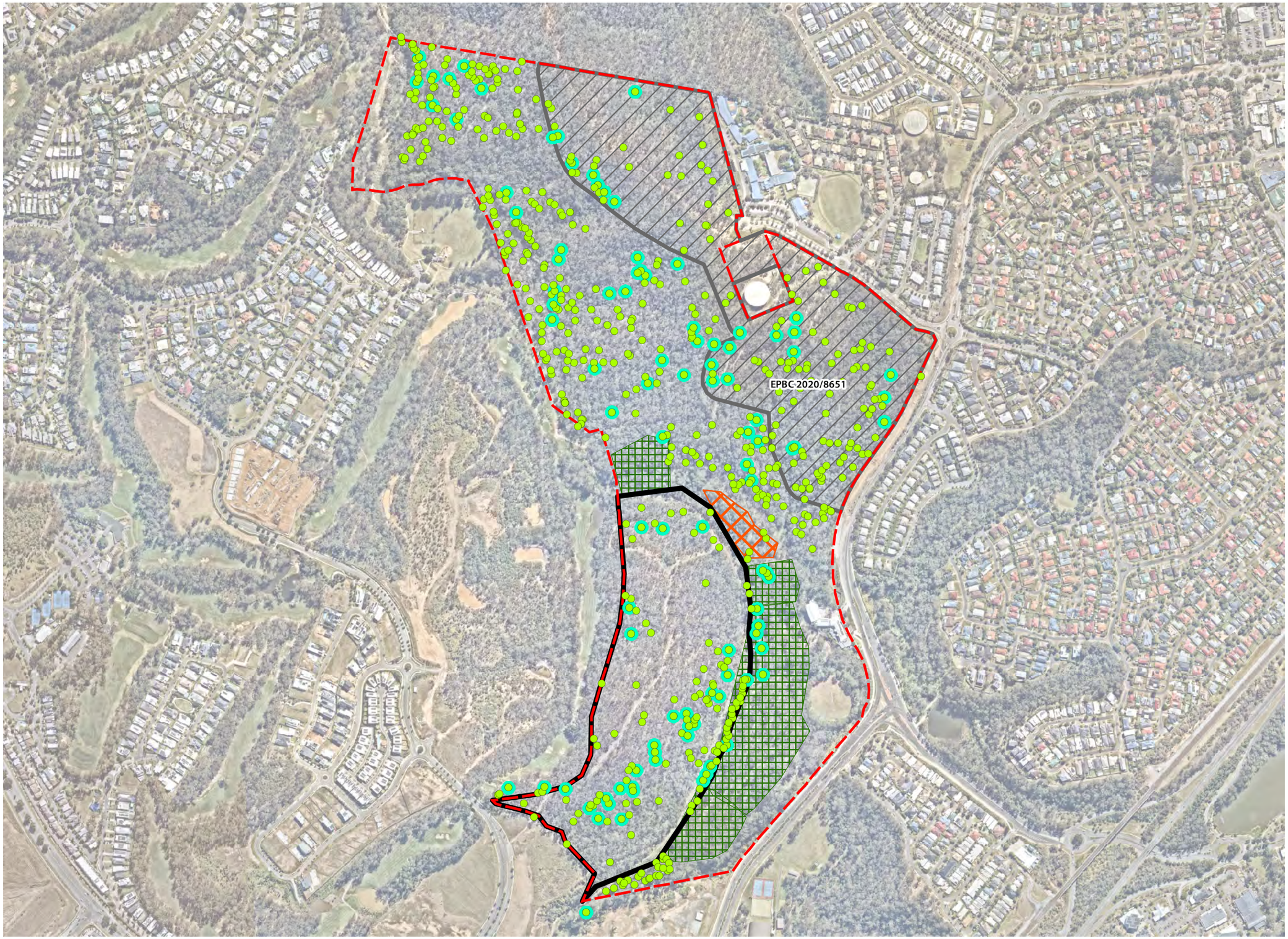
18/08/2026 | 7399 E A24 Forest Maturity F

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A25. Greater Glider Diurnal Habitat Assessment and Hollow-tree Plot



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Legend

- Referral Area
- Survey Effort Extent
- Eucalyptus grandis patch
- Celtis sinensis patch

GPS Tree Plot

- Tree with DBH > 460mm [628]
- Tree with Hollows [101]

Issue	Date	Description	Drawn	Checked
F	18/08/2026	Preliminary	HW	AW

0 50 100 150 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:7,500 @ A3

Address / RPD: 163/SP291400

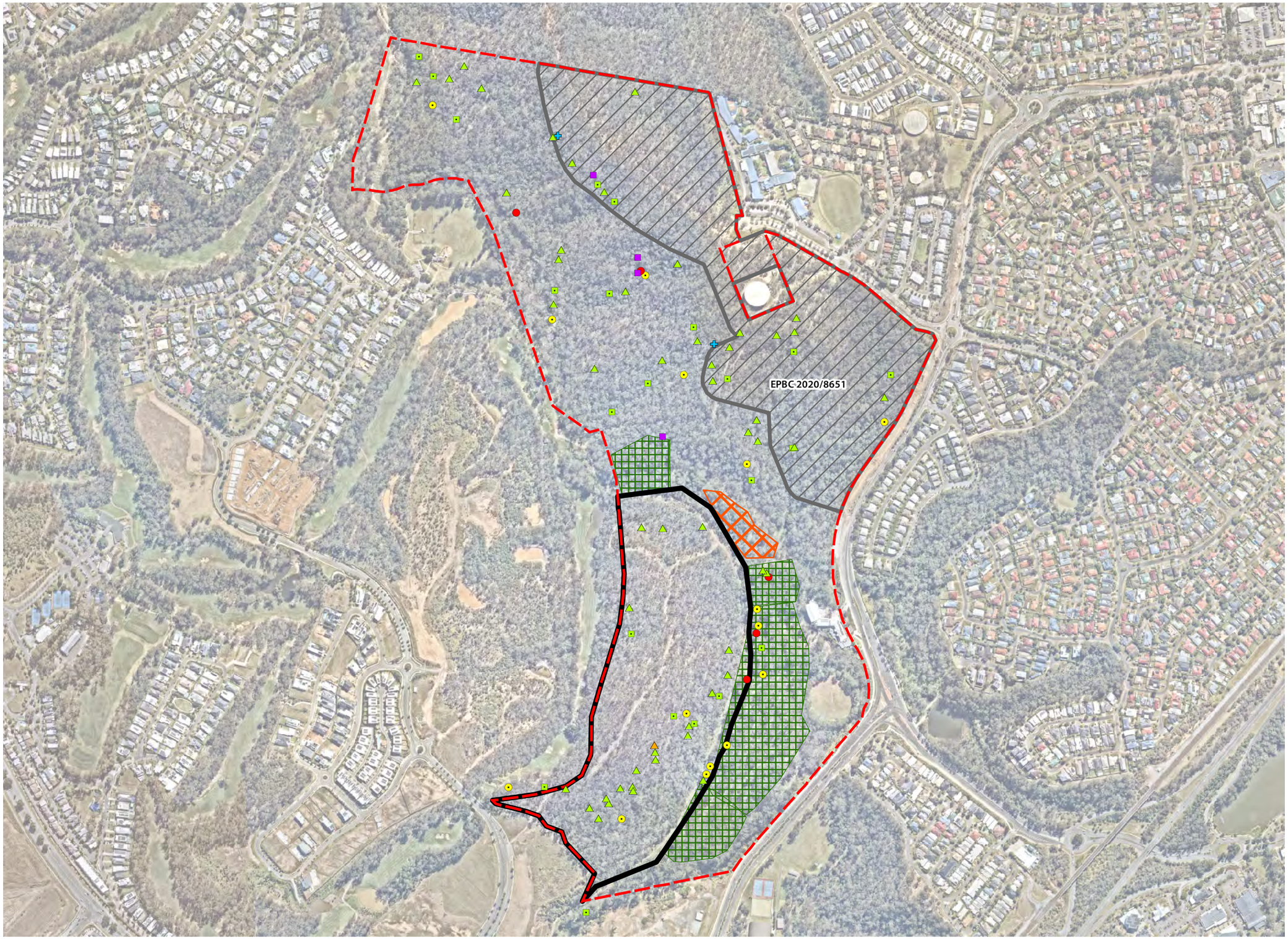
18/08/2026 | 7399 E A25 GG Diurnal Assessment F

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A26. Tree Plot Assessment – Hollow Categories



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Legend

- Referral Area
- Survey Effort Extent
- Eucalyptus grandis patch
- Celtis sinensis patch

GPS Tree Plot

Tree with Hollow/s - Small [85 small hollows]	[52]
Tree with Hollows - Small and Medium [42 small hollows, 29 medium hollows]	[22]
Tree with Hollows - Small and Large [2 small hollows, 1 large hollow]	[1]
Tree with Hollow/s - Medium [18 medium hollows]	[15]
Tree with Hollow/s - Medium and Large [6 medium hollows, 5 large hollows]	[4]
Tree with Hollow/s - Large [6 large hollows)	[5]
Tree with Hollow/s - Small, Medium and Large [4 small hollows, 3 medium hollows, 4 large hollows]	[2]

Issue	Date	Description	Drawn	Checked
F	18/08/2026	Preliminary	HW	AW

0 50 100 150 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:7,500 @ A3

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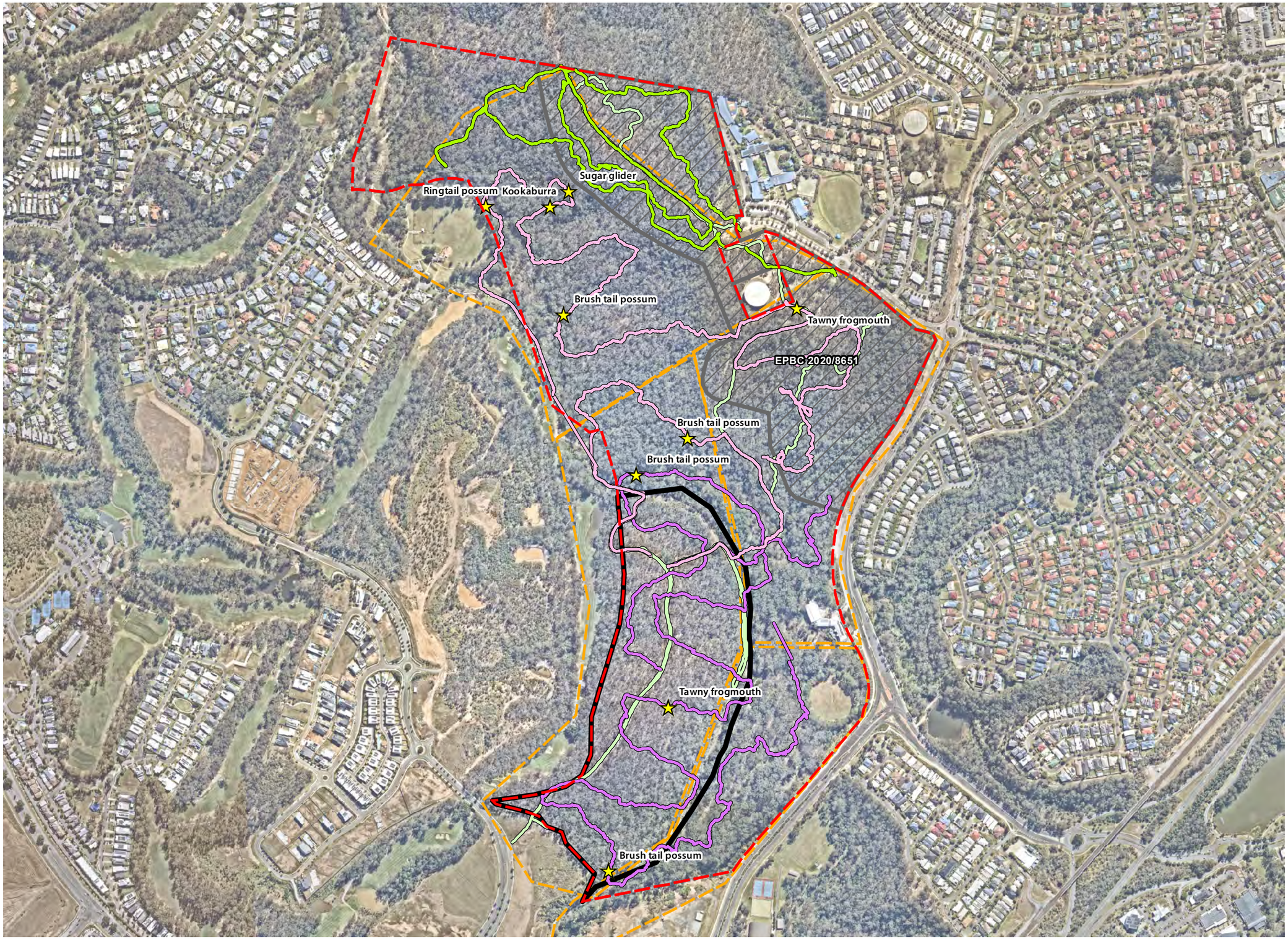
SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A26 Hollow Assessment F

A27. Greater Glider Targeted Spotlighting Field Survey



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Legend

- Referral Area
- SHG Survey Effort Extent
- RPA Survey Effort Extents
- Spotlighting (22/11/2022)
- Spotlighting (11/09/2023)
- Spotlighting (13/09/2023)
- Spotlighting (20/09/2023)
- Fauna observations

Issue	Date	Description	Drawn	Checked
F	18/08/2026	Preliminary	TF	AW

0 50 100 150 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:7,500 @ A3

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Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A27 Targeted Spotlighting F

3.3.7 Collared delma (*Delma torquata*)

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

Distribution

The collared delma (*Delma torquata*) is a small legless lizard endemic to Queensland and is listed as Vulnerable under both the EPBC Act and the Queensland NCA. The species has a naturally restricted and fragmented distribution within south-east and central Queensland and extending into northern NSW. Records occur primarily within the western suburbs of Brisbane, with additional populations recorded in the Lockyer Valley, Bunya Mountains, Expedition National Park, Blackdown Tableland and other areas of the Brigalow Belt Bioregion (Hines et al. 2000; Peck, 2004; Peck and Hobson, 2007).

The species is considered highly fragmented throughout its range, with populations occurring as isolated clusters associated with suitable rocky woodland habitat. Within the Brisbane region, records are concentrated in Mt Crosby, Moggill State Forest, Pullenvale, Pinjarra Hills, Anstead, Upper Brookfield, Kenmore and surrounding localities. Surveys have demonstrated that suitable habitat may support relatively localised populations, and the patchy distribution of rocky refugia is considered a key factor influencing the species' occurrence.

The collared delma is recognised as a sedentary species with limited dispersal capability and high site fidelity. Consequently, further habitat fragmentation and habitat removal presents a significant threat to population persistence, with many known populations occupying relatively small and isolated habitat patches of approximately 100 m x 100 m (Peck, 2004).

Habitat and Ecology

The collared delma inhabits eucalypt-dominated woodland and open forest communities, typically associated with relatively undisturbed ridges and slopes containing rocky outcrops or scattered surface rocks on Land Zones 3, 9 and 10 (DCCEEW, 2026), usually with a westerly aspect (Peck, 2003). The species is generally associated with dry open forest communities with potential preference for certain vegetation types such as *Eucalyptus populnea* (poplar box) and *Eucalyptus crebra* (narrow-leaved ironbark) dominated woodlands. In the Toowoomba Range suitable habitat is commonly associated with exposed rocky outcrops on ridges or slopes in vegetation communities dominated by *Eucalyptus crebra* (narrow-leaved ironbark) and *Corymbia citriodora* (spotted gum). Recognised habitat characteristics associated with vegetation types for the region west of Brisbane consists of a mid-storey of *Alphitonia excelsa* (soap tree), *Acacia* species, *Lophostemon confertus* (brush box) and *Hovea longifolia* (Hovea). Preferred habitat typically contains an open mid-storey, a grassy understorey dominated by native grasses such as *Themeda triandra* (kangaroo grass) and *Cymbopogon refractus* (barbed-wire grass), and a well-developed leaf litter layer.

A defining habitat feature for the species is the presence of exposed rocks in direct contact with the soil surface. These rocks provide essential shelter, thermoregulatory sites and protection from predators. The species is most frequently recorded beneath small to medium-sized rocks, fallen timber and leaf litter. Western Brisbane populations have been recorded on stony lithosols with exposed quartzite ridges and on basalt-derived soils containing abundant surface rocks. A preference for larger sized rocks was noted by Porter (1998) in a study of the Mt Crosby population with average rock sizes of rocks utilised by lizards of

172 cm. The presence of rocks, logs, bark and other coarse woody debris, and mats of leaf litter (typically 30–100 mm thick) appears to be an essential characteristic of the Collared Delma microhabitat and is always present where the species occurs (DCCEEW, 2026). This may be the limiting factor for the Collared Delma recolonising in recently burnt areas (Peck, 2003). Habitat quality may be reduced where weeds, particularly Creeping Lantana (*Lantana montevidensis*), obscure or replace rock refugia.

The collared delma is insectivorous and feeds primarily on small invertebrates, including cockroaches, crickets and potentially subterranean termites (Peck, 2004). The species is cryptic and spends much of its time sheltering beneath rocks and within leaf litter, making detection difficult during field surveys. Available information indicates that populations occur at relatively low densities and individuals exhibit strong site fidelity (Porter, 1998). Recapture studies have recorded individuals beneath the same rocks over extended periods, while movements between capture events have generally been less than 20 metres, indicating small home ranges and limited dispersal capacity (Porter, 1998).

The principal threats to the species are habitat loss, fragmentation and degradation associated with urban expansion, infrastructure development and agricultural activities. Removal of surface rocks, inappropriate fire regimes and weed invasion, particularly *Lantana montevidensis* (Creeping Lantana) are also recognised threats due to their potential to reduce the availability and quality of critical shelter and foraging habitat. Given the species' limited mobility, fragmented distribution and dependence on specific microhabitat features, the collared delma is particularly sensitive to habitat disturbance.

b) *Quantification of the extent of habitat and (if known) the number of individuals present, or historical patterns of use on, and surrounding, the development footprint (including maps identifying known or potential habitat.*

The site is located within a large, fragmented patch of eucalypt dominated woodland located on Land Zones 9-10. Within the referral area, the dominant Land Zone is 9-10 with vegetation communities including RE12.9-10.19 and RE12.9-10.3 with a small area of RE12.9-10.15. It is noted that the dominant vegetation community on-site is *E. fibrosa* (broad-leaved ironbark) which does not align with the species' key canopy tree preferences. *Corymbia citridora* (spotted gum) and *E. crebra* (narrow-leaved ironbark) are present as scattered trees or isolated patches.

Land Zone 3 is dominant within the surrounding creek line systems of Opossum Creek and Woogaroo Creek with patches of Land Zone 9-10 containing composite vegetation communities (refer **Plan A28**). The site and immediate surrounding areas contain broad vegetation types that are consistent with the broad macrohabitat requirements for the collared delma. Similar vegetation community types are found within the broader locality of Greater Springfield and surrounds and includes urban fragments, waterway corridors and vegetation reserves such as White Rock-Spring Mountain Conservation Park and Greenbank Military Training Area (refer **Plan A29**).

While Greater Springfield contains broad vegetation types suitable to support the collared delma, species occurrence is dependent on the presence of suitable microhabitat, including sloping rocky outcrops or scattered rocks and dense mats of leaf litter. The referral area contains scattered areas of potential habitat including sloping ridgelines and rocky outcrops.

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

The referral area and immediate surrounding areas including where the patch continues to the south, and adjoining creek line areas contain broad vegetation characteristics suitable for the collared delma (i.e., Land Zones 9, 10 and 3 and open eucalypt vegetation) (refer **Plan A29**). While the site contains macrohabitat, microhabitat characteristics including coarse woody debris, leaf litter and native grass tussocks and medium-sized surface rocks (100-200 cm in diameter) which are considered a key microhabitat resource (Porter, 1998), are found to be absent from within the referral area and adjoining areas.

Additionally, the collared delma is known to be particularly sensitive to fire disturbance due to their sedentary nature and low dispersal capability (DEWHA, 2008). Inappropriate bushfire regimes are damaging as they are known to deplete critical habitat attributes, shelter and availability of invertebrate prey needed for the species to survive. The broader habitat patch and large parts of Greater Springfield were affected by a large, unplanned wildfire in September 1994 as shown by Queensland fire scar mapping (refer **Figure A7**). The September 1994 wildfires occurred as part of major outbreaks across a number of South East Queensland local government areas. Unplanned wildfires are typically hot and sweep through the landscape quickly and as a result deplete woody debris, vegetation and insects more readily and for a longer time. While these attributes have been progressively replenished throughout the site, the species' potential for recolonisation is limited and presence of resources do not equate to presence. Additionally, the following years would see progressive development commence in the adjoining suburb of Camira, hindering potential recolonisation.

Patterns of appropriate fire use have also been recorded in the locality, conducted by ICC and QFES. Notably, a series of hazard reduction burns were carried out in White Rock Conservation Area and White Rock-Spring Mountain Conservation Estate in October 2012 (refer **Figure A8**). These hazard reduction burns employed cool burn techniques and a mosaic pattern to reduce intensity and scale and preserve patches of the landscape and habitat values, unlike the 1994 fires which were uncontrolled, high intensity and broad sweeping.

Areas within the Springfield locality including the nearby EPBC 2019/8575 referral area have been subject to previous assessments of collared delma by ecological consultants Cardno and Austecology which similarly confirm the presence of microhabitat areas, however, indicate a pattern of low or marginal quality habitat. The Austecology report (2013) which surveyed microhabitats in a 300-ha study area in Spring Mountain in April 2013 stated "Whilst microhabitats known to be used by the Collared Delma are patchily distributed across the site, they are not abundant and the diversity of such microhabitats is not high at any of the potential target survey areas. Furthermore, a moderate to dense tussock grass cover, also regarded as an important microhabitat resource, is not a feature of any of the survey sites (attaining a moderate foliage projection cover at best)." The Cardno study which focused on habitat adjoining the referral area concluded "Despite extensive searches, it is unlikely the species occurs within the Study Area owing to the scarcity of habitat, historic disturbance and lack of local records."

It is considered that the historical high-intensity bushfire disturbance and the subsequent removal of vegetation communities in the surrounding areas indicates a reduced likelihood that the site currently

supports a resident population due to the species' limited capacity to recolonise historically disturbed areas, particularly in a locality where the species has not been documented previously.

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

The collared delma's distribution is comprised of fragmented populations within a relatively restricted range. Within the Brisbane-Ipswich region confirmed areas of occurrence are predominantly concentrated within the western suburbs of Brisbane, from approximately 10 km north of the referral area and north of the Brisbane River. The population sizes are generally unknown, however, the Mt Crosby population which has been subject to extensive study confirmed the presence of 39 individuals (DCCEEW, 2026).

Records of the collared delma within the Ipswich locality and surrounding the referral area are notably sparse. One record dated April 2023 is located 5.5 km south-west of the referral area within White Rock Conservation Park. It is noted the record metadata indicates the location has been generalised to a 29.7 km grid located over parts of Ipswich, Logan and Brisbane city suburbs, however, the approximate location was confirmed to be within the contiguous vegetation areas of White Rock and Spring Mountain.

Outside of the confirmed record, a population of collared delma has not been documented within the Ipswich region despite the presence of suitable vegetation communities. Targeted surveys have been carried out by ecological consultants previously within the connecting habitat areas (EPBC 2019/8575 referral area) and areas of Greater Springfield. Cardno completed an extensive collared delma survey adjoining the adjoining EPBC 2018/8575 referral area in 2014 as part of the assessment for EPBC 2014/7306 and included identification and delineation of potential microhabitat, and completion of active searches and pitfall trapping to detect presence (Cardno, 2014). Despite the presence of microhabitat attributes, no collared delmas were detected as part of these surveys. Additionally, targeted collared delma surveys were completed by Austecology in 2013 across a 300-ha study area as part of ecological assessments completed for the masterplanned development Springfield Rise (EPBC 2013/7057) which similarly did not detect the species with the assessment concluding that microhabitats were of a low quality (Austecology, 2013). Both reports are publicly available through the EPBC Act Public Portal.

The lack of historical records of collared delma within Ipswich, and more specifically, Greater Springfield is noteworthy when considering the dominance of macrohabitat. It is however noted that research and survey efforts within the region have been markedly less than within the suburbs of western Brisbane, which have been the focus of ongoing monitoring and restoration efforts by local bush care groups due to it being a known stronghold for the species.

e) An assessment of the adequacy of any surveys undertaken (including survey effort and timing). In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with the relevant survey guidelines.

Historical surveys

The history of targeted surveys encompassing large areas of Springfield including within the broader habitat patch where the referral area is located with no evidence of presence documented, is considered a relevant consideration for this assessment, largely due to the species' ecology and element of repeat surveys across time. Noting the collared delma's sedentary nature, sensitivity to disturbance and low recolonisation potential, the lack of recorded presence both from the ecological surveys completed and public records suggests a low potential for persistence in a landscape where records are already sparse to absent and disturbance associated with vegetation clearing for development has all but expanded.

Survey guidelines generally agree that optimal survey timing is during the spring or broadly from September to late March when conditions are warm and maximum temperatures are greater than 25°C (DCCEEW, 2023b; DSEWPaC 2011b), therefore timing being autumn is considered appropriate. Active searching is generally considered more effective at locating the species than other methods such as pitfall trapping based on multiple studies (DSEWPaC, 2011b). A minimum of three survey days incorporating repeat surveys is recommended as a minimum survey effort (DCCEEW, 2026).

The surveys conducted by Cardno (2014) within the EPBC 2019/8575 referral area utilised a combination of pitfall trapping and active searching methods including turning over logs and rocks, lifting loose bark, investigating hollow log and disturbing leaf litter for a period of 15 search hours in March/April 2014 over four days. The Austecology study in Spring Mountain was completed in the previous year in April 2013 as part of assessments to support EPBC 2013/7057 and included hand searches and rock-turning at 15 microhabitat sites across the 300-ha study area over a 21-day survey period. A summary of survey effort with reference to recommend survey guidelines is provided in **Table A16**.

Despite these surveys occurring in 2013 and 2014, they provide a relevant overview of patterns of occurrence and microhabitat distribution in the locality and continue to be relevant where considering the species' known dispersal limitations and strong site fidelity.

On-site Microhabitat

Surveys to detect and describe potential microhabitat were conducted within the referral area during ecological ground-truthing and general meander surveys on the 23 and 24 January 2020 with reconfirmation surveys over the following two survey tranches.

Microhabitat attributes searched for included exposed embedded rocks, scattered un-embedded surface rocks, presence and density of leaf litter, coarse woody debris, native grasses and sedges, and orientation of the slope. Higher value habitat areas typically contain a mix of embedded rocks and frequent small (<30 cm), moderate (30-100 cm) and large (100-200 cm) sized surface rocks with partial contact with the soil layer to support sheltering, with the added presence of grass tussocks, sedges and woody debris. Additionally, the presence and cover of creeping lantana was noted as it can alter the suitability of microhabitat by

smothering rocks and other sheltering features. While not a documented threat to microhabitat, *Passiflora suberosa* (corky passion vine) was also noted as these can form dense clumps which may also degrade microhabitat. Broad vegetation attributes including dominant canopy and understorey species were noted due to the known vegetation preferences of the species.

The entire referral area adjoining areas were traversed as part of these surveys. Suitable microhabitat was not found to be present within the referral area or immediate surrounding areas. The surrounding areas are notably highly disturbed with Brookwater Golf Course to the west, flooded gum plantation to the east and weed infested areas dominated by *Celtis sinensis* and *Pinus sp.* to the north (refer **Plan A30**).

The referral area and surrounding areas lack rocky sloping terrain that allow the formation of distinct microhabitat attributes that the collared delma requires. Large areas of historical modification including ground layer disturbance are present within the referral area (refer **Plan A30**), creating a whipstick regrowth quality and simplified ground layer structure that contains minimal presence of key microhabitat attributes such as scattered surface rocks.

Fauna Spotter Catcher data

Fauna Spotter Catcher data has been collated across a large portion of Greater Springfield. The collared delma has never been recorded in any detailed pre- or post-clearance fauna surveys undertaken through the surrounding Springfield City developments, including Springfield Rise (EPBC 2013/7057), Kalina (EPBC 2014/7306), Woogaroo Heights (EPBC 2017/7875) and Brookwater (EPBC 2016/7676) (refer **Attachment A7** for further details). This includes detailed pre-clearance fauna surveys undertaken over much larger approved development areas pre-, during and post-clearing totalling 350 days between October 2016 and March 2026. Additionally, fauna spotter records of the QUU sewer clearing undertaken throughout Brookwater was reviewed. Notably, the Fauna Spotter Catcher data analysed relates to clearing events that were undertaken when Springfield was much more connected.

Pre-clearance surveys were completed by suitably qualified fauna spotter catchers and included systematic searches for terrestrial habitat features such as leaf litter and scattered rocks and considered the potential for species to occur on-site based on the presence of these features. A number of these reports identified the potential for presence of the collared delma. Due to the attention towards identifying microhabitats, a review of fauna spotter-catcher records is considered to provide relevant contextual information regarding potential occurrence of the species in the context of Greater Springfield, particularly where substantial areas of potentially suitable habitat have been progressively cleared and monitored without records of the species being obtained.

Table A16: Collared delma field survey effort relative to guidelines

Relevant Guidelines	Recommended Methodology	Cardno Survey Effort	Austecology Survey Effort	Survey Adequacy
Draft referral guidelines for the nationally listed Brigalow Belt reptiles and the Survey Guidelines for Australia's Threatened Reptiles.	One-off diurnal searches • Searching microhabitats, such as carefully turning woody debris, rocks and artificial debris, raking the soil surface or leaf litter beneath trees and looking beneath peeling bark for reptiles or their sloughs • Optimal survey time is during the coolest parts of the day • Survey over a minimum of 1.5 person hours per hectare for habitats of average complexity per targeted species • Survey over a minimum of 3 days	Diurnal searches • Flipping rocks, disturbing woodpiles, investigating hollow logs and disturbing leaf litter in suitable habitat. The searches covered areas of rocky slopes • 15 search hours over 11 ha search area • Conducted over 4 days • Conducted during morning and evening	Diurnal searches • Systematic hand searches at microhabitat sites and opportunistic searches conducted over 21 days • Conducted in November 2012 and April 2013	**Guidelines met** • Surveys were conducted at an appropriate time of year where maximum temperatures are greater than 25°C. • Primary survey methods used recommended survey techniques (diurnal hand searches) with pitfall trapping employed by Cardno. • Repeat surveys conducted by Austecology. • For confirmed microhabitat areas, Cardno search effort aligns with minimum survey effort.
Survey guidelines for Australia's threatened reptiles	• One-off hand searches (including raking through leaf litter) in appropriate habitats • pitfall trapping during late spring to summer. A series of pitfall trap lines comprising six 4–10 litre buckets and funnel traps spread along a 15 metre fence would be an appropriate trap design	Hand searches (see above) Pitfall trapping • A single pitfall and funnel trap array was established at four transects • Each pitfall and funnel array comprised four 20L plastic buckets, six funnel traps and	Hand searches (see above)	

Relevant Guidelines	Recommended Methodology	Cardno Survey Effort	Austecology Survey Effort	Survey Adequacy
		approximately 50m of drift fence arranged in a T-shape. This gives a total of 160 trap nights for the survey period. • The Pitfall and funnel array was consistent with the recommended design in the Terrestrial Vertebrate Fauna Survey Guidelines for Queensland (Eyre et. al., 2012).		



Legend

- Referral Area
- **1994 Fire scar mapping Queensland**
- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Figure A7

Fire Scar Mapping
Queensland 1994

SPRINGFIELD CITY GROUP

File ref. 2026_Collared Delma
Date 18/08/2026
Project Scenic Precinct

0 1 2 km

Scale (A4): 1:60,000 [GDA 2020 MGA Z56]

N

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Layer Sources © State of Queensland 2026



Legend

- Referral Area

2012 Fire scar mapping Queensland

- January
- February
- March
- April
- May
- June
- July
- August
- September
- October
- November
- December

Figure A8

Fire Scar Mapping
Queensland 2012

SPRINGFIELD CITY GROUP

File ref. 2026_Collared Delma
Date 18/08/2026
Project Scenic Precinct

0 1 2 km

Scale (A4): 1:60,000 [GDA 2020 MGA Z56]

N

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A28. Collared delma broad vegetation types – patch-level



Notes:
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Legend

Referral Area

Impact Area [18.9 ha]

Broad Vegetation Types

Landzone 3 regional ecosystems

Landzone 9-10 regional ecosystems

Issue	Date	Description	Drawn	Checked
A	18/08/2026	Preliminary	HW	AW

0 100 200 300 400 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:12,500 @ A3

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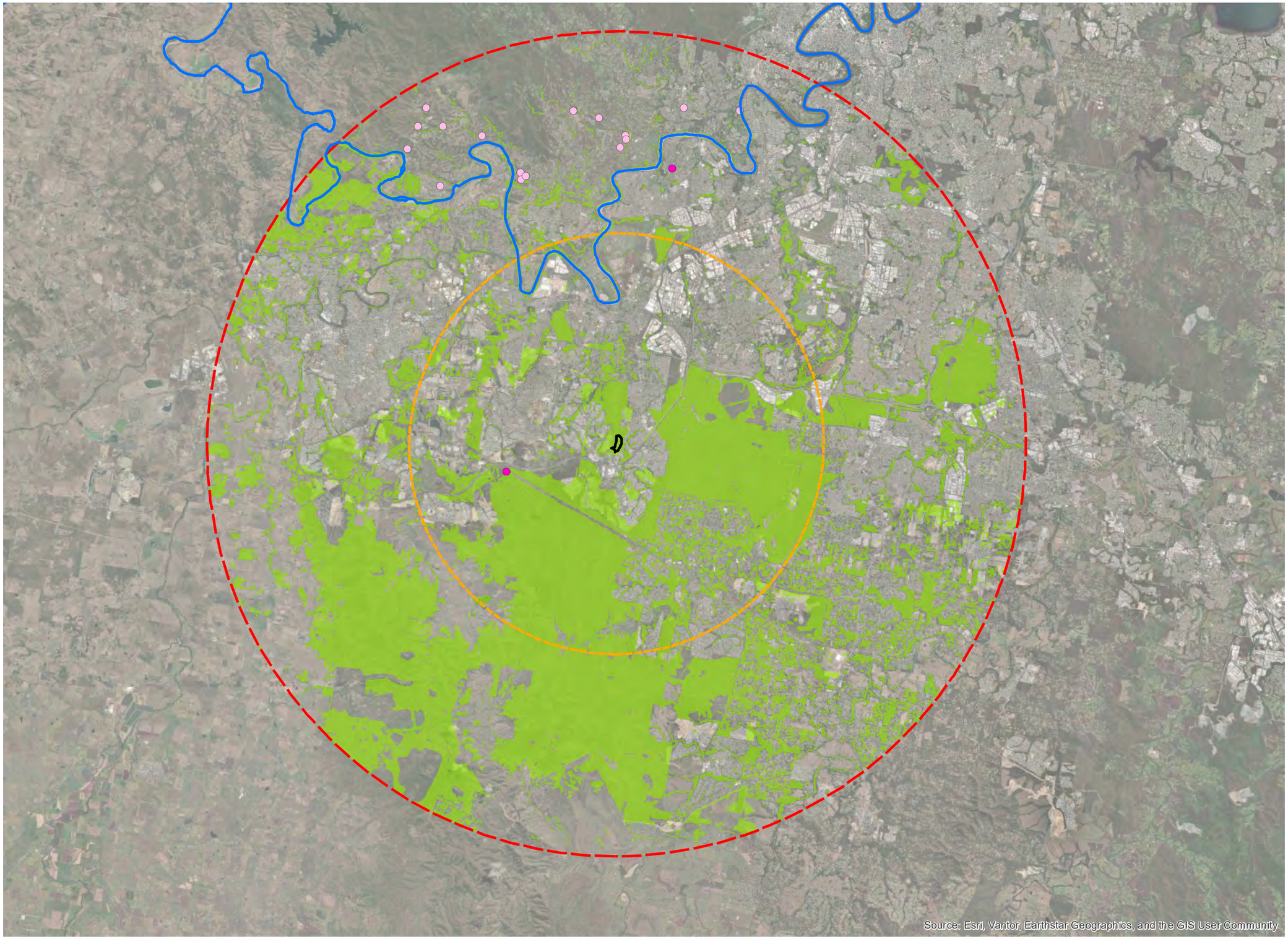
SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 51/SP242316

18/08/2026 | 7399 E A28 Collared delma patch-level A

A29. Collared delma records and broad vegetation types – locality



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Legend

- Referral Area
- 10km Referral area buffer
- 20km Referral area buffer
- Brisbane River
- Collared Delma Broad Vegetation Types within 20km of Referral area - 29%
- Collared Delma records within 20km of referral area [20] * Species records are generalised on grid systems ranging from 5m to 4.5km.
- Collared Delma records within 20km of referral area [2] * Species records are generalised on a 29.7 km grid.

Issue	Date	Description	Drawn	Checked
A	18/08/2026	Preliminary	HW	AW

0 1 2 3 4 Kilometers

Transverse Mercator | GDA 1994 | Zone 56 | 1:187,733 @ A3

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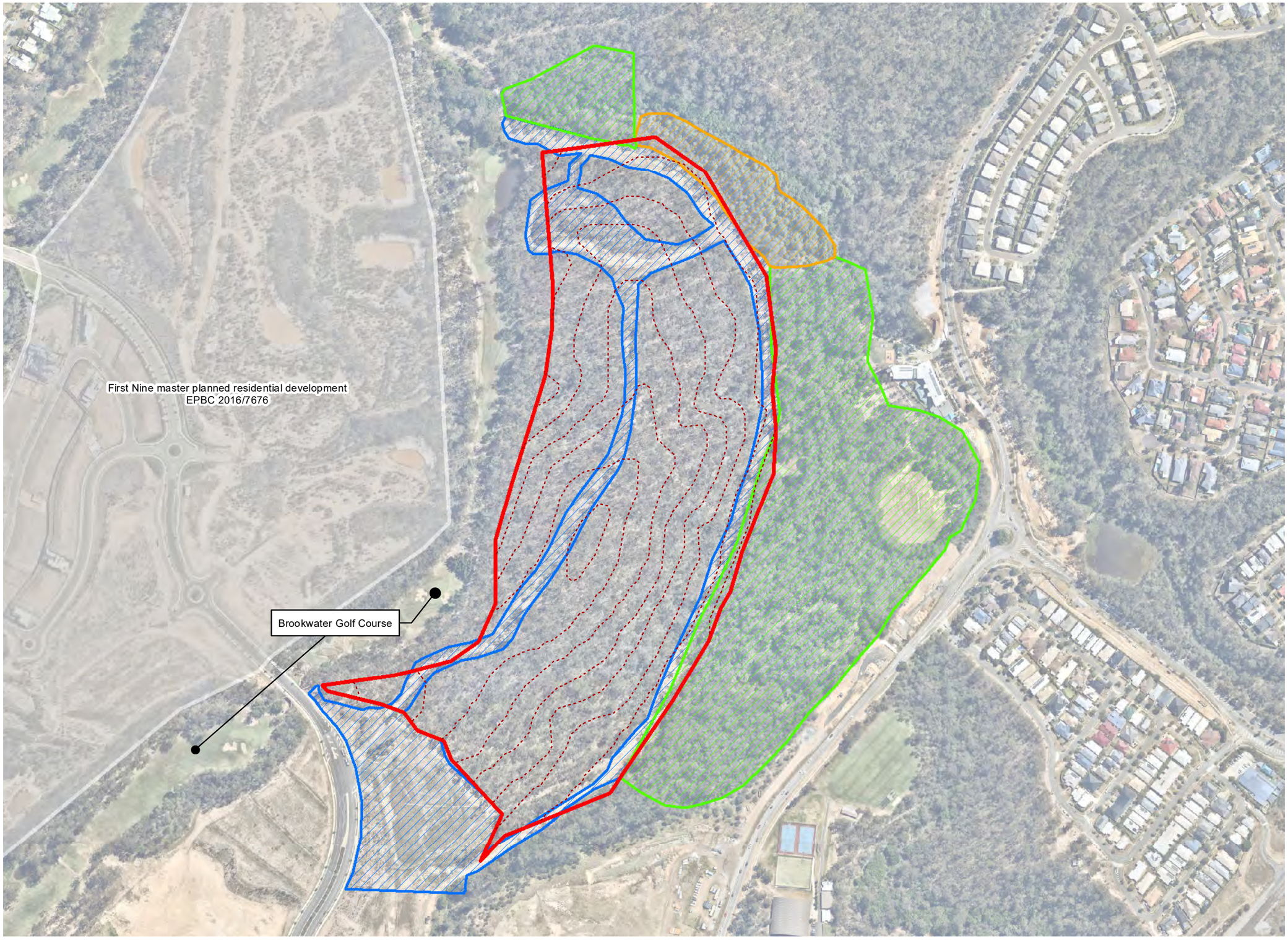
SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 51/SP242316

18/08/2026 | 7399 E A29 Collared delma locality_level A

A30. Collared delma microhabitat and disturbance survey



Notes:
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Legend

- Qld DCDB
- Referral Area [18.9 ha]
- Site Contours (5m)
- Other EPBC projects
- Celtis sinensis patch
- Eucalyptus grandis and historic oval
- Historical access track and thinning

* No microhabitat features to support the collared delma are present within or adjoining the Peninsula Precinct

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	19/08/2026	Amendments	HW	AW

0 25 50 75 100 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:4,281 @ A3

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Peninsula Precinct

Address / RPD: 163/SP291400

3.4 Information about the methods, data and literature used to identify and assess environmental values

Item 3.4 of the PD Request asks for *"**information about the methods, data and scientific literature used to identify and assess the environmental values on the proposed action site and surrounding area, including survey data and historical records. Survey data for the proposed action site must be provided for the above listed threatened species, should be as recent as possible, and must not have been collected more than five years before the date of this letter**"*.

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:

- *Terrestrial Vertebrate Fauna Survey Guidelines.*
- *Survey guidelines for Australia's Threatened Bats.*
- *Survey Guidelines for Australia's Threatened Mammals.*
- *Survey Guidelines for Australia's Threatened Birds.*
- *Survey Guidelines for Australia's Threatened Reptiles.*
- *EPBC Act Referral Guidelines for the Vulnerable Koala.*
- Queensland *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* (version 1.2)
- *Biocondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland* (version 2.1)

A reference list has been provided with this PD (refer **Section 10**) which includes all literature reviewed and cited, as well as the sources of survey methods, guidelines and historical records. All survey methods undertaken have been guided by best practice and where applicable, Commonwealth and State survey guidelines for threatened species.

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

- 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 Scientific Permits

Ecological field surveys were conducted on the subject site in the attempt to confirm presence of potential MNES. Fauna surveys were conducted under the following permits held by Saunders Havill Group:

- Scientific Purposes Permit **WA0022007** granted under Section 12(f) of Nature Conservation (Administration) Regulation 2017
- Department of Agriculture and Fisheries (DAF) Ethics clearance **CA 2020/02/1355**
- Scientific User Registration **SUR000451**

3.4.3 Field Survey Methods

Field surveys utilising the methods outlined in the following subsections were conducted to describe ecological value of the referral area and to detect MNES fauna species. Field surveys were undertaken during seasonal conditions generally favourable to the detection and identification of the targeted fauna species. Field survey methods were completed in accordance with the relevant survey guidelines over within 3 tranches:

- Tranche 1 – 23 and 24 January 2020 on a bright a sunny day with no rainfall.
- Tranche 2 – 6, 7, 8, 11 and 12 January 2021 during relatively warm conditions with minimal recent rainfall within the Springfield Central.
- Tranche 3 – 7, 8, 11, 13, 18 and 20 September 2023 during relatively clear conditions.

Due to the proximity and similar timing of the Peninsula Precinct (EPBC 2020/8629) and adjoining Scenic Precinct (EPBC 2020/8651) which are both development projects for the same proponent, surveys were generally undertaken simultaneously and across both project areas. The survey area for certain methodologies including spotlighting, RPA wildlife aerial drone surveys and bird surveys were undertaken across a combined survey area of 88.6 ha encompassing both project areas and adjoining vegetation areas within the Opossum Creek corridor.

Refer to **Table A16** for weather data and targeted MNES survey techniques implemented across the survey period.

A summary of field survey techniques applied targeting specific MNES, the survey guidelines used, total combined survey effort and field survey personnel and qualifications for each method are provided in **Table A18**.

Table A17: Field Survey Methods Summary

Date	Time	Weather Conditions	Methods
23 January 2020	8.00 am – 3.00 pm AEST	16.4°C min – 28.6°C max 0 mm rainfall	MHQA transects, SAT surveys, scat meander, general meanders, photo points
24 January 2020	8.00 am – 3.00 pm AEST	16.4°C min – 30.0°C max 0 mm rainfall	MHQA transects, SAT surveys, scat meander, general meanders, photo points
6 January 2021	6.00 am – 9.00 am AEST	20.0°C min – 35.2°C max 0 mm rainfall	Dawn bird survey
7 January 2021	6.00 am – 9.00 am AEST	21.1°C min – 26.4°C max 53 mm rainfall	Dawn bird survey
8 January 2021	6.00 am – 9.00 am AEST	20.1°C min – 27.4°C max 0 mm rainfall	Dawn bird survey
11 January 2021	6.00 am – 9.00 am AEST	15.3°C min – 27.9°C max 0 mm rainfall	Dawn bird survey
12 January 2021	6.00 am – 9.00 am AEST	14.4°C min – 29.6°C max 0 mm rainfall	Dawn bird survey
7 September 2023	8.00 am – 3.00 pm AEST	11.2°C min - 28.1°C max 0mm rainfall	Greater Glider habitat assessment – large tree and hollow identification
8 September 2023	8.00 am – 3.00 pm AEST	11.7°C min - 28.1°C max 0mm rainfall	Greater Glider habitat assessment – large tree and hollow identification
11 September 2023	3.00 pm – 11 pm AEST	8.8°C min - 22.1°C max 0mm rainfall	Greater Glider habitat assessment – large tree and hollow identification, Dusk bird survey, Spotlighting
13 September 2023	3.00 pm – 11 pm AEST	5.8°C min - 24.8°C max 0mm rainfall	Spotlighting, UAV Drone survey
18 September 2023	8.00 am – 3.00 pm AEST	9.1°C min - 28.5°C max 0mm rainfall	Greater Glider habitat assessment – large tree and hollow identification
20 September 2023	3.00 pm – 11 pm AEST	9.6°C min - 30.8°C max 0mm rainfall	Dusk bird survey, Spotlighting, UAV Drone survey

Source: Bureau of Meteorology – Bellbird Park (040985) for rainfall data and Greenbank defence (140009) for temperature data.

Table A18: Summary of targeted field survey techniques and survey effort

Scientific Name	Common Name	Survey guidelines	Techniques Implemented and survey effort	Field personnel qualifications
Phascolarctos cinereus	Koala	*Survey guidelines for Australia's threatened mammals* Phillips and Callaghan (2011)	• 3 Spot Assessment Technique surveys • 15 hours of spotlighting meanders over 3 days. • Assessment of foraging and breeding values (habitat suitability)	**Senior Ecologist** • 5 years of relevant experience • Bachelor of Science (Ecology and Zoology) **Ecologist** • Three years of relevant experience • Bachelor of Science (Ecology) and Master of Environmental Management
Pteropus poliocephalus	Grey-headed flying-fox	*Survey guidelines for Australia's threatened bats*	• Daytime roost/camp searches (2020, 2023) • 15 hours of spotlighting meanders over 3 days (March 2019 and August 2023) • Assessment of foraging values, stem density assessment plots, and habitat suitability	**Senior Ecologist** • 15+ years of relevant experience • Bachelor of Applied Science (Natural Systems and Wildlife Management) **Senior Ecologist** • 5 years of relevant experience • Bachelor of Science (Ecology and Zoology) **Graduate Ecologist** • Two years of relevant experience • Bachelor of Science (Ecology)
Petauroides volans	Greater glider	*Survey guidelines for Australia's threatened mammals* *Reporting detections of*	• 15 hours of spotlighting meanders over 5 days (September 2023) • Assessment of breeding habitat (hollows) and foraging values (September 2023)	**Senior Ecologist** • 5 years of relevant experience • Bachelor of Science (Ecology and Zoology)

Scientific Name	Common Name	Survey guidelines	Techniques Implemented and survey effort	Field personnel qualifications
		Southern Greater Gliders (Conservation Regulator Victoria) *Approved Survey Standards: Greater Glider Petauroides volans V1.0* (Department of Sustainability and Environment (Victoria, Australia, May 2011)	• GPS location of hollow-bearing trees and significant trees (≥460 mm diameter measured at breast height) within and adjoining project area (September 2023)	**Senior Ecologist** • 5 years of relevant experience • Bachelor of Environmental Management (Natural Systems and Wildlife) **Graduate Ecologist** • Two years of relevant experience • Bachelor of Science (Ecology)
Anthochaera phrygia	Regent honeyeater	*Survey guidelines for Australia's threatened birds*	• Stem density assessment plots – assessment of foraging values (winter flowering eucalypts)	**Senior Ecologist** • 5 years of relevant experience • Bachelor of Science (Ecology and Zoology) **Ecologist** • Three years of relevant experience • Bachelor of Science (Ecology) and Master of Environmental Management
Lathamus discolor	Swift parrot	*Survey guidelines for Australia's threatened birds*	• Stem density assessment plots – assessment of foraging values (winter flowering eucalypts)	**Senior Ecologist** • 5 years of relevant experience • Bachelor of Science (Ecology and Zoology) **Ecologist** • Three years of relevant experience

Scientific Name	Common Name	Survey guidelines	Techniques Implemented and survey effort	Field personnel qualifications
				• Bachelor of Science (Ecology) and Master of Environmental Management
Hirundapus caudacutus	White-throated Needletail	*Survey guidelines for Australia's threatened birds*	• 20 hours of dawn meander surveys over 5 days in January 2021 (summer)	**Principal Ecologist** • 10+ years of relevant experience • Bachelor of Science (Threatened Species Ecology and Zoology) **Ecologist** • Three years of relevant experience • Bachelor of Science (Ecology) and Master of Environmental Management

3.4.3.1 Targeted Bird surveys

Targeted bird surveys were completed in accordance with the *Survey Guidelines for Australia's Threatened Birds* to address survey requirements for identified MNES bird species with consideration to species-specific survey requirements.

This technique is a non-intrusive active area search that provides a direct census of bird species occurrence and abundance. Surveys involved walking slowly through woodland habitat with an emphasis on areas containing flowering eucalypts. Birds were identified either from direct observation or their calls. Inclement weather was avoided as this greatly reduces the detection of bird species.

Targeted dawn surveys for the White-throated Needletail were completed from 6 – 12 January 2021 (inclusive). The five (5) dawn surveys occurred between 06:30 and 09:00. Total survey effort was over 20 hours. In accordance with the *Survey Guidelines for Australia's Threatened Birds* bird surveys were targeted in areas of flowering eucalypt trees due to the large size of the site. Prior to the bird surveys, a survey to scope out and locate areas of flowering eucalypt trees was completed during initial surveys (16 March 2020).

Contemporary dusk bird surveys across the referral area and surrounding bushland were completed between 15:00 and 17:30 on 11 and 20 September 2023. All avian species observed during the targeted survey assessment period were recorded. Furthermore, birds were opportunistically surveyed across the referral area for the duration of the broader site surveys in 2020, 2021 and 2023.

3.4.3.2 Koala habitat and SAT surveys

Tools for determining localised levels of use by *Phascolarctos cinereus* (Koala) included the Spot Assessment Technique (SAT) and opportunistic observations for Koala and Koala activity throughout the field survey effort. The SAT surveys were undertaken in accordance with methodology developed by the Australian Koala Foundation (AKF) and Phillips and Callaghan (2011) and specified in the *EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)*. The guidelines and recommended methodology were used at the time of surveys conducted during 2019 to 2022.

The SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT involves identifying a 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 physical presence, identifiable scratches or scats. The nearest non-juvenile tree is then identified and the same data recorded. The next closest non-juvenile tree to the first tree is then assessed and so on until 30 trees have been surveyed. Assessment of each tree involves a systematic search for Koala scats beneath the tree within a 1 m radius of the trunk. After approximately two minutes of searching for scats, the base of the trunk is observed for scratches and the crown for Koala. 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.

A total of three (3) SAT surveys were completed within the project area across 23 and 24 January 2025.

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

The referral area was walked on multiple occasions over several years 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.

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.

3.4.3.4 Scats, tracks and other traces search

Surveys for scats, tracks and other fauna traces were conducted throughout the survey period during May and June 2021. Both predator and non-predator scats were sought during all searches. Only those samples definitively identified were included in the survey results. 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 notice of potential dens, scats and tracks for invasive species was taken to identify predator-prey interactions and understand existing impacts within the referral area.

3.4.3.5 Flying fox roost searches

Targeted surveys for Grey-headed Flying-fox were conducted on 23 and 24 January 2020 and 7 and 8 September 2023 for flying-fox roost searches. The searches were completed in accordance with the accepted methodologies detailed in the *Survey guidelines for Australia's threatened bats*.

The flying fox roost search was conducted during the day within the survey area, watching for flying-foxes and listening for their distinctive calls. This search is not only for flying-fox camps, but the presence of food plants to assess the potential importance of the survey area to the species. This involved assessing tree canopies whilst completing meanders across the site. The search for flying-fox roosts was justified due to the proximity of the site to an active flying-fox camp located at Camira, Barbara Street (140), approximately 3.6 km north-east of the site.

3.4.3.6 Ground-truthing of vegetation communities

Vegetation was ground-truthed and assessed against current VMA Regional Ecosystem (RE) mapping and pre-clear mapping. This included reviewing the accuracy and extent of mapped RE types in addition to the broad vegetation condition. Particular attention was made in identifying the presence and extents (where applicable) of threatened ecological communities (TECs) listed as having the potential to occur on or proximal to the site.

A comprehensive flora survey was undertaken using a methodology consistent with the established formats used by the Queensland Herbarium (Nelder et al. 2020 and Hnatiuk et al. 2009). Survey methodology comprised an initial visual audit, followed by quantitative assessment of vegetation associations and communities. Distinct vegetation community boundaries were delineated during field survey assessment.

Targeted surveys to assess vegetation communities on-site and on land adjacent to the subject site were completed on 16 March 2020.

3.4.3.7 Large trees and Hollow Habitat Assessment

Greater Glider habitat assessments were conducted over a period of three (3) days in September 2023. All trees containing hollows and all trees with DBH >460 mm were identified and GPS located within the Peninsula project site and surrounding vegetation within the Opossum Creek Corridor. The following data was recorded:

A handheld GPS device (Trimble) is used to record sub-metre accurate locations (in some cases survey accurate locations are used), and the following parameters of each tree specimen 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 is measured using the standard method of Diameter at Breast Height (DBH);
- height of the tree is measured using a laser rangefinder with three-point measurement capability (inclinometer);
- canopy spread;
- health assessment (*i.e.*, canopy, trunk); and
- habitat values (for example, presence and/or number of hollows, nests, termites, scratches and scats).

3.4.3.8 Spotlighting

A combination of high-powered spotlights and head torches were used to detect nocturnal mammals, birds and reptiles within the referral area in accordance with the relevant Commonwealth and State survey guidelines. Spotlighting meander surveys were completed on foot by two observers and involved slowly walking through eucalypt woodland at an average pace of 10 minutes per 100 m. Observers took care to ensure areas already surveyed were not revisited during the same survey transect. It was also ensured that surveys were not completed during inclement weather such as strong winds or rain to limit the potential for reduced detectability.

Spotlighting surveys were completed in accordance with the prescribed spotlighting methodology for arboreal mammals and nocturnal bird species within the relevant survey guidelines including *Survey Guidelines for Australia's Threatened Mammals*. A total of three (3) two-person spotlighting meander surveys have been completed over the project area including 11, 13 and 20 September for a total survey period of 15 hours. Each spotlighting meander transect was completed over a period of approximately three or more hours between 16:00 and 21:30. The spotlighting surveys covered the entire Peninsula project site along with the Opossum Creek corridor north and east of the site.

3.4.3.9 RPA Wildlife Aerial Thermal Surveys

Targeted Wildlife Aerial Thermal drone surveys by qualified mapping personnel. These surveys used RPA (remotely piloted aircraft) equipped with a thermal sensor to detect the presence of arboreal mammals including Koala and Greater Glider.

Targeted Wildlife Aerial Thermal surveys were conducted by two (2) SHG mapping personnel. These surveys involved using RPA (remotely piloted aircraft) equipped with a thermal sensor to detect the presence of Greater Glider within the referral area. The methodology and findings of the wildlife aerial thermal surveys are provided in **Attachment A5**.

The targeted surveys were undertaken during evenings well after dark when temperatures were lower (20:00-2:00) to fully utilise the thermal sensor capabilities. A combination of autonomous flight and manual operation was used to undertake the survey. This method allows for detailed searching of large areas in a single evening. Frequent stops were necessary to observe for suspicious thermal signatures (other than target species) and assess whether closer inspection was necessary (*i.e.,* small heat signatures and animal activities that can be readily classified e.g. Flying-foxes).

When a potential thermal signature was detected, the RPA was put into "hover mode" to maintain position without further outputs from the pilot. Thermal and RGB still images are then captured for further analysis during the desktop processing. After confirming the features of the image to be wildlife, several still images were taken to capture the subject from different angles. Direct overhead still image was also captured to provide GPS location. The georeferenced location is also recorded within Flight Hub 2 to assist with desktop analysis. After performing the image and location capture, the RPA then resumes automated flight along the predetermined flight path until the area search is complete.

3.4.3.10 Modified Habitat Quality Assessment (MHQA)

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** for more detail on methodology. In order to determine the quantum and quality of the habitat suitable for Koala within the referral area, vegetation/habitat quality was derived from the Modified Habitat Quality Assessment tool. A total of two (2) MHQA transects were completed within the referral area.

3.4.3.11 Collared delma microhabitat searches

Microhabitat ground-truthing surveys including potential habitat for the collared delma were completed within the referral area as part of general meander surveys on the 23 and 24 January 2020 with reconfirmation surveys over the following two survey tranches. Microhabitat searched for across the site included exposed embedded rocks, scattered un-embedded surface rocks, presence and density of leaf litter, coarse woody debris, native grasses and sedges, and orientation of the slope. Additionally, the presence and cover of creeping lantana was noted as it can alter the suitability of microhabitat by smothering rocks and other sheltering features. While not a documented threat to microhabitat, *Passiflora suberosa* (corky passion vine) was also noted as these can form dense clumps which may also degrade microhabitat. Broad vegetation attributes including dominant canopy and understorey species were noted due to the known vegetation preferences of the species.

4. Quantification of Impacts

4.1 Intended land uses

Item 4.1 of the PD Request asks for "***a description of the intended land uses proposed as part of the completed development, including any proposed conservation areas or retained movement corridors, and associated ongoing activities, and details of the intended party that would be responsible for future management activities.***"

Springfield City Group is proposing to develop a master planned residential community on this land. The proposed development footprint will necessitate the disturbance of 18.9 ha of land (refer **Plan A31**). The proposed development will include a mixed precinct comprising:

- Town Business;
- Retail;
- Education; and
- Town Residential.

The referral area is zoned as 'Town Centre' with a small area of 'Creek Line Open Space' under the Land Use Concept Master Plan under the SSP (refer **Figure A9**). The site plan of development is considered to align with on-ground values and the planning intent of the area (refer **Plan A1**), with the Creek Line Open Space area to be consolidated and delivered adjoining the referral area to the east and north, providing a future permanent buffer to the adjoining Opossum Creek values (refer **Plan A32**).

The Peninsula Precinct forms part of the Springfield Town Centre North which from a planning perspective is governed by the *Springfield Town Centre North Overarching Master Planning Framework, January 2018* approved by Ipswich City Council on 29 January 2018 (ref: 5593/2017). The Springfield Town Centre North area has an irregular shape and total site area of approximately 80 hectares, which includes three core land use areas being the Peninsula Precinct high-density residential area, district park and open space areas and Town Centre North Core (refer **Insert 1**).

Under the plan, the Peninsula Precinct will be a high-density residential development area which will establish as a series of neighbourhoods, each reflecting a distinct character in response to the local context and amenity of the surrounding environment. The residential community will be positioned between the Brookwater Golf Course and the open space amenity of Opossum and Mountain Creeks. It will benefit from proximity to the Town Centre North Core, Springfield Central railway station and Orion Springfield Central.



Insert 1 – Springfield Town Centre North Area

It is noted that the Precinct Plan to be developed and submitted for approval by ICC is required to be consistent with the zoning under the Land Use Concept Master Plan and must address several environmental matters including identification of site constraints (e.g. gullies, ridgelines, special features), demonstration of how the sustainability and physical integrity of waterways and creek line open space areas will be maintained, stormwater and flood event design, drainage corridors, water quality, and the effect of any proposed land filling.

The adjoining Creek Line Open Space and District Park (Level 2) mapped outside the referral area to the south, east and north of the referral (refer **Plan A32**) is intended to be retained as vegetation and transferred to Ipswich City Council for ownership to form part of the broader open space network that is accessible and responsive to the needs of the local community. Notably, this includes the large area of *Eucalyptus grandis* (flooded gum) plantation.

The District Park / Creek Line Open Space adjoining the referral area is to be embellished to a high quality for the benefit of the community in accordance with the following requirements:

- Retention and enhancement of vegetation values including flooded gums;
- Removal of weed species and revegetation with approved and complementary planting;

- Provision of embellishment generally in accordance with the requirements and values specified by Ipswich City Council Planning Scheme Policy 3;
- Amenities and facilities where required as part of park embellishments shall be selected and positioned with regard to vegetation and topographical and hydrological constraints.

It is noted that under ICC ownership other infrastructure types may be facilitated as part of the broader delivery of the District Park / Creek Line Open Space, however, will be separate to the Peninsula Precinct action.

4.2 Proposed impact and retention areas

Item 4.2 of the PD Request requests "***current maps and coordinates/shapefile of the proposed impact area and areas of habitat for MNES proposed to be retained. Maps must clearly identify development footprints, buffer zones, and any conservation areas where impacts will be avoided, and areas of adjacent habitat that would be subject to indirect impacts, including areas that are to be retained within and adjacent to the site.***"

Item 4.3 of the PD Request asks to "***Confirm the area of habitat that will be directly and indirectly impacted by the proposed action, including areas where:***

a) Connectivity to surrounding habitat will be retained or removed

b) Adjacent habitat will be subject to intensification of ongoing impacts (for example, through increased levels of dust or polluted runoff)."

A total of 18.9 ha of vegetation within the referral area will be impacted to facilitate the construction of a mixed use precinct comprising town business, roads and infrastructure and/or town residential. Impacts will be contained wholly within the referral area with setbacks and buffers achieved to the adjoining waterway corridor associated with Opossum Creek in accordance with ICC specifications under the *Ipswich City Plan 2025*.

At this stage, the action is limited to a master plan development footprint as the project has not progressed to detailed design phase associated with obtaining local government approvals. Detailed design will contemplate topographical constraints, stormwater and dispersive soils requirements, and setbacks to the adjoining waterway corridor as required by ICC. The Opossum Creek corridor is designated as open space in the *Ipswich City Plan 2025* and ICC will require detailed assessment of how the corridor will be retained and protected as part of obtaining ADP and OPW approvals. The general exclusion zone of the development encompassing Opossum Creek is depicted on **Plan A1**. ICC typically require a minimum 40 m setback of development activities from waterway centrelines to protect riparian values and maintain landscape function. Detailed assessment of the adjoining waterway corridor will be required as part of the documentation prepared for the local approval process whereby details of setbacks will be planned and demonstrated.

Presently, the referral area is exposed to constant urban and construction noise sources from major roads, surrounding schools and a combination of government-based projects and private area developments. Project design will facilitate all residential and vehicle access from the south to connect with existing roads. No collector roads are proposed to be constructed in an east-west direction with no transport impacts proposed to the creek corridor or the golf course. The project land holding is centrally located in the town centre and as a result will not disrupt any environmental connectivity to south, east or north.

It is known that Koalas occur within the vegetated areas within and adjoining the referral area and utilise the network of corridors provided via Opossum Creek, Woogaroo Creek and O'Dwyer's Gully. The location of the Peninsula Precinct within the southernmost extremity of the broader patch represents a dead-end for connectivity for fauna including the Koala with major infrastructure located to the south and south-west. The Opossum Creek corridor in particular is identified as a local connectivity route which is limited in certain respects by the location of surrounding infrastructure. This includes the location of Springfield Parkway and Hymba Yumba Independent School to the east and Brookwater Golf Course to the west. The school facilities and sports fields are 80 m from the referral area boundary separated only by plantation timber rows of a former forestry operation.

Opossum Creek environmental corridor includes existing ICC landholdings dedicated by the Springfield City Group as part of the broader environmental network for the city. Under the delivery of the residential areas including the Scenic Precinct and proposed retained Creek Line Open Space Area a minimum 100 m wide retained corridor will be delivered (refer **Plan A32**). Overarching planning for the region by ICC will enable the retention of this corridor in perpetuity allowing for continuous fauna movement and refuge as the region continues to develop. Additionally, this will retain ongoing connection with the proposed environmental retention areas under EPBC 2019/8575 to the north.

Broadly, the Proponent proposes to rehabilitate the adjoining Opossum Creek corridor and will likely be conditioned to do so by ICC as part of ADP and OPW approvals. Proposed rehabilitation works will include at a minimum, weed management, waterway stabilisation and infill planting where required.

While the volume of habitat will decrease as a result of the action, the maintenance and improvement of the Opossum Creek corridor as a 100 m wide corridor with the delivery of the Peninsula and Scenic Precincts will ensure local population connectivity of fauna including the Koala is maintained. This is supported by the population analysis completed by BAAM (refer **Attachment A4**).

Indirect impacts on the adjoining Opossum Creek corridor as a result of the development may include dust deposition during construction (*i.e.,* temporary) and increased light and noise during construction and during operation. These indirect impacts are discussed further in **Section 4.10** with mitigation measures detailed in **Section 5**.

A31. Development Impact



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 Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources

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Legend

- Qld DCDB
- Referral Area [18.9 ha]
- Development Footprint [18.9 ha]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 25 50 75 100 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:3,500 @ A3

saunders havill group

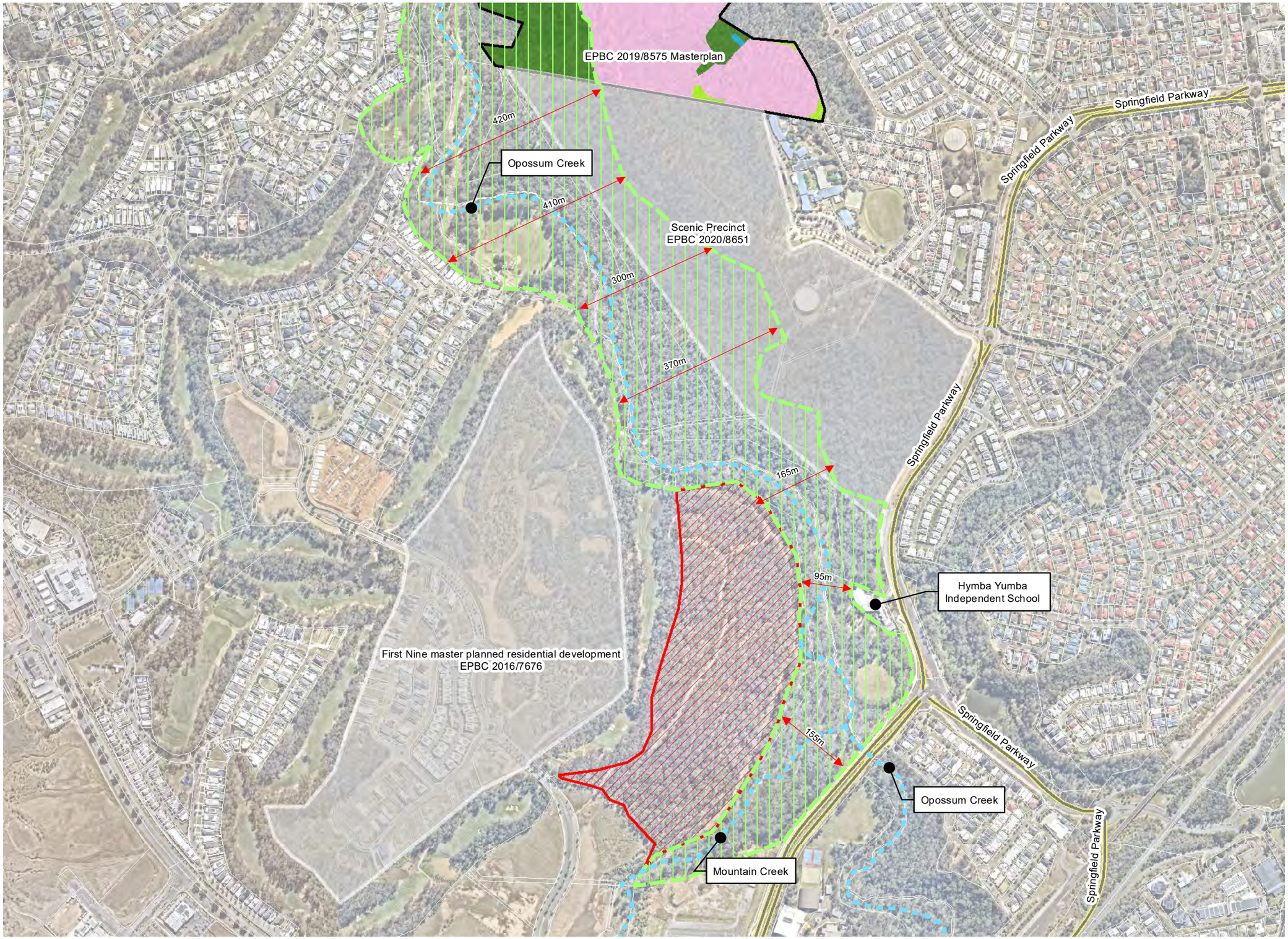
SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A31 Development Impact F

A32. Opossum Creek Environmental Corridor



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 Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

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Legend

- Referral Area (18.9)
- Opossum Creek Environmental Corridor
- Other EPBC projects
- Identified Waterway
- Arterial Roads

Issue	Date	Description	Drawn	Checked
A	18/08/2026	Preliminary	HW	AW

0 50 100 150 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:8,000 @ A3

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SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 51/SP242316

18/08/2026 | 7399 E A32 Opossum Creek Environmental Corridor A

4.3 MNES impact assessment

Item 4.4 of the PD Request asks to *"**Confirm the quantity and quality of suitable habitat to be impacted within the proposed action area.**"*

The following subsections provide detailed information regarding the quantification of impacts for Koala, Grey-headed Flying-fox, Swift Parrot, Regent Honeyeater, Greater Glider and White-throated Needletail.

In addition, an assessment against the Significant Impact Guidelines (SIG 1.1) has been completed for the following MNES to determine whether or not the impact is likely to be significant on the following species:

- Swift parrot (*Lathamus discolor*) – Critically Endangered (**Section 4.4.2**);
- Regent honeyeater (*Anthochaera phrygia*) – Critically Endangered (**Section 4.5.2**);
- Greater glider (*Petauroides volans*) – Vulnerable (**Section 4.6.2**); and
- Collared delma (*Delma torquata*) – Vulnerable (**Section 4.10**).

Specific definitions relating to the significant impact assessment are presented in **Table A19**.

Table A19: Significant Impact Guidelines 1.1 definitions

Term	Species Listing Status applicable	Definition
Important population	Vulnerable species	An **'important population'** is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and / or that are: ▪ key source populations either for breeding or dispersal ▪ populations that are necessary for maintaining genetic diversity, and/or ▪ populations that are near the limit of the species range.
Population of a species	Critically Endangered and Endangered species	A **'population of a species'** is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to: ▪ a geographically distinct regional population, or collection of local populations, or ▪ a population, or collection of local populations, that occurs within a particular bioregion.
Invasive species	Critically Endangered and Endangered species	An **'invasive species'** is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or

Term	Species Listing Status applicable	Definition
		ecological communities by direct competition, modification of habitat or predation.
Habitat critical to the survival of a species of ecological community	Critically Endangered and Endangered 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, or ▪ for the reintroduction of populations or recovery of the species or ecological community. Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.
Significant Impact	Critically Endangered, Endangered and Vulnerable species	A **'significant impact'** is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts. A proponent should consider all of these factors when determining whether an action is likely to have a significant impact on matters of national environmental significance In order to decide whether an action is likely to have a significant impact, it is necessary to take into account the nature and magnitude of potential impacts. In determining the nature and magnitude of an action's impacts, it is important to consider matters such as: • the sensitivity of the environment which will be impacted • the timing, duration and frequency of the proposed development and its impacts • all on-site and off-site impacts • all direct and indirect impacts • the total impact which can be attributed to the proposed development over the entire geographic area affected, and over time • existing levels of impact from other sources, and • the degree of confidence with which the impacts of the proposed development are known and understood.

4.4 Koala

4.4.1 Modified Habitat Quality Assessment

The action proposes to impact **18.90 ha** of vegetation that is identified as providing critical habitat for the Koala. The habitat critical to the survival of the Koala is presented in **Plan A13**.

4.4.2 Assessment Methodology

To determine the quantum impact and quality of the habitat suitable for koala on-site, vegetation / habitat quality was derived from the Modified Habitat Quality Assessment (MHQA) tool. This assessment method utilises the Queensland *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* Version 1.2 April 2017 and the Queensland *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland V2.2 February 2015* (BioCondition 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 Koala. The BioCondition method provides the base methodology for the terrestrial habitat quality and in some cases the scoring and methods from BioCondition have been used within the MHQA Tool. These instances are identified within the methodology.

<u>Assessment Units</u>

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

The vegetation on-site is considered to be consistently representative of Remnant RE12.9-10.2 across the site therefore the site is considered one (1) assessment unit (refer **Plan A3**).

<u>Modified Habitat Quality Assessment</u>

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 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 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 15 condition characteristics. Each condition characteristic and the relevant scoring and benchmark percentage is provided in **Table A20**.

Table A20: Koala site condition scoring attributes (BioCondition Manual)

Site condition attribute	Scoring and benchmark percentage				
(1) Recruitment of woody perennial species in ecologically dominant layer in EDL*	Score	0	3		5
	Benchmark	<20%	≥20-75%		≥75%
(2) Native plant species richness – trees	Score	0	2.5		5
	Benchmark	<25%	≥25-90%		≥90%
(3) Native plant species richness – shrubs	Score	0	2.5		5
	Benchmark	<25%	≥25-90%		≥90%
(4) Native plant species richness – grasses	Score	0	2.5		5
	Benchmark	<25%	≥25-90%		≥90%
(5) Native plant species richness – forbs	Score	0	2.5		5
	Benchmark	<25%	≥25-90%		≥90%
(6) Tree canopy height	Score	0	3		5
	Benchmark	<25%	≥25-70%		≥70%
(7) Tree canopy cover	Score	0	2	3	5
	Benchmark	<10%	≥10%-<50%	≥200%	≥50-200%
(8) Shrub canopy cover	Score	0	3		5
	Benchmark	<10%	≥10%-<50% or ≥200%		≥50-<200%
(9) Native perennial grass cover	Score	0	1	3	5
	Benchmark	<10%	≥10-50%	≥50-90%	≥90%
(10) Organic litter	Score	0	3		5
	Benchmark	<10%	≥10%-50% or ≥200%		≥50-<200%

Site condition attribute	Scoring and benchmark percentage				
(11) Large trees	Score	0	5	10	15
	Benchmark	0%	0-50%	≥50-100%	≥100%
(12) Coarse woody debris	Score	0	2		5
	Benchmark	<10%	<50% or ≥200%		≥50% or <200%
(13) Non-native plant cover	Score	0	3	5	10
	Benchmark	>50%	≥25-50%	≥5-25%	<5%
(14) Quality and availability of food and foraging habitat	Score	1	5		10
	Benchmark	SC1-13 attributes = <27/80 (<33% of benchmark)	SC1-13 attributes = >27/80-<54/80 (33% of benchmark)		SC1-13 attributes = >54/80
(15) Quality and availability of shelter	Score	1	5		10
	Benchmark	SC1-13 attributes = <27/80 (<33% of benchmark)	SC1-13 attributes = >27/80-<54/80 (33% of benchmark)		SC1-13 attributes = >54/80 (≥66% of benchmark)

Assessment methodology of the above condition characteristics mostly do not differ from the traditional terrestrial habitat quality assessment. 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 attributes 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 three (3) MHQA transects were completed across the site on 23 and 24 January 2020. Refer **Plan A3** for the location of MHQA transects.

Site Context (30 %)

The site context assessment considers the landscape characteristics adjoining the site. Site context is measured using a suite of attributes to describe the location of the habitat within the surrounding landscape and the influence of its associated threats. This assessment also considers the influence of adjacent vegetated areas and ecological corridors. Under the MHQA, site context is measured using seven characteristics. In developing the MHQA, three species habitat index characteristics were nominated to form part of the site context characteristics: role of site location to overall species population in the state, threats to the species, and species mobility capacity. The seven characteristics are listed below with details of how each are measured in accordance with the *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* version 1.2.

- Size of patch – Measured as the area of vegetation in which the assessment unit(s) is contained, and add on all other directly connecting areas of koala habitat. The calculation of the area of the patch size uses the method outlined in the BioCondition assessment manual v2.2 that considers the patch to be areas connected by corridors greater than 200 m wide within a 1 km radius of the site. This methodology includes use of a "segmentation" process that removes areas connected to the assessment area by narrow corridors (refer **Plan A33**);
- Connectedness – Relates to the capacity that the species have to disperse through the landscape. This attribute is calculated using GIS by measuring the length koala habitat along the boundary of the site, calculated as a percentage (refer **Plan A33**);
- Context – The context score is calculated by GIS to quantify the amount of vegetation immediately surrounding the assessment site. It is measured as the percentage of koala habitat within a 1 km radius of the site (refer **Plan A33**);
- Ecological corridors – This attribute is as per the methods of the Guide to determining terrestrial habitat quality V1.2 and is used to determine if a site is located within or shares a boundary with an ecological corridor that facilitates long term ecosystem function by connecting large patches of remnant vegetation with sufficient tract size (corridor width in relation to the fragmentation of the landscape) (EHP 2014). These corridors support the habitat of MNES by providing opportunity for long term dispersal of habitat species following landscape level changes in climate. Although the ecological corridors allow for the dispersal of MNES themselves, for example, Koala, this is not their primary function when assessing the attribute. An 'ecological corridor' is represented as any 'Riparian' or 'Terrestrial' feature within the 'CORR_TYPE' attribute table of the 'Queensland biodiversity and vegetation offsets special features' map. The mapping can also be viewed on Queensland Globe in the 'Statewide Biodiversity Corridors' layer (refer **Plan A34**);
- Role of site location to species overall population in the state – This attribute is based on the observed role of the site in relation to the overall population of the species. The scoring table considers the species' use of the site – such as whether it is used for feeding and/or nesting and the effect that damage to or removal of the site would have to the likelihood of the species' overall population survival.
- Threats to the species – This attribute identifies the presence and severity of threatening processes observed at or adjacent to the site which may include clearing associated with development, creation of a barrier to movement, introduction or spread of disease or pathogens, risk of high-intensity fires, degradation of habitat from hydrological change and introducing or increasing mortality attributed to vehicle strike or dog attacks. The highest threat level is given to a site if it isolated from other Koala habitat, or if major roads without exclusion measures, or residential encroachment is within 1500 m of the site boundary.
- Species mobility capacity – Scored based on the presence and severity of factors that would contribute to a reduction in the mobility of the species such as barriers that would result in a long-term reduction in genetic fitness or access to important resources. Examples of mobility limited factors include roads, large, cleared areas and weed infestations. Under the Habitat Quality Guideline, this is measured in terms of a percentage reduction.

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.

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. While remnant eucalypt forest vegetation is critical habitat for Koala, equally Koalas can utilise areas of non-remnant vegetation or high value regrowth vegetation that does not yet achieve remnant status. Therefore, site context under the MHQA accounts for surrounding Koala habitat rather than remnant vegetation.

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

Scoring attributes extracted from the Habitat Quality Guideline are provided in **Table A21**.

Table A21: Koala site context scoring attributes

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

Site context attribute	Scoring and benchmark percentage			
	Severely restricted (76-100% reduction)	High restricted (51-75% reduction)	Moderately restricted (26-50% reduction)	Minor restriction (0-25% reduction)

Species Stocking Rate (40 %)

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

Species stocking rate is calculated using the following parameters:

- Species presence on or adjacent to the site – whether or not evidence of koala has been recorded within or adjoining the site. Evidence may be direct in the form of observation of koalas, or indirect via the presence of scats.
- Species usage of the site (habitat type and evidenced usage) – the type of habitat includes vegetation structure such as whether it contains remnant, regrowth or non-remnant vegetation values, and evidenced usage is the confirmed presence or use of the species within the habitat. Both factors are used to inform the species usage of the site. Depending on the level of variability in vegetation and usage patterns across the site, this characteristic may be scored differently for assessment units.
- Approximate density of the species on the site – measured through the use of Spot Assessment Technique (SAT) (Phillips *et al.* 2011) and targeted searches with a high probability of detection, including UAV drone surveys. The combination of methods produces a higher reliability of data when extrapolating koala density. The SAT method is an industry recognised technique for identifying presence/absence of koala and measuring activity. SAT survey results are interpreted using the broad population categories provided in the Australian Koala Foundation Koala activity level classification table to infer an activity level or approximate density. These categories being 'East Coast (low)', 'East Coast (med-high)' and 'Western (med-high)' are shown in **Table A9**. (refer **Section 3.3.4, f)**). Depending on the population category applied, Koala activity is described as 0%, 'low', 'moderate', or 'high'.
- Role/importance of species population on site – the extent to which the site is considered a key source population for breeding, dispersal, is necessary for maintaining genetic diversity or near the limit of the species' range.

Baseline Koala activity levels were determined through utilising the SAT method (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 *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 3.3.4**. **Table A22** outlines the attributes utilised to assess species stocking rate.

Table A22: Species Stocking Rate Scoring

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

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

Scoring Weight Justification

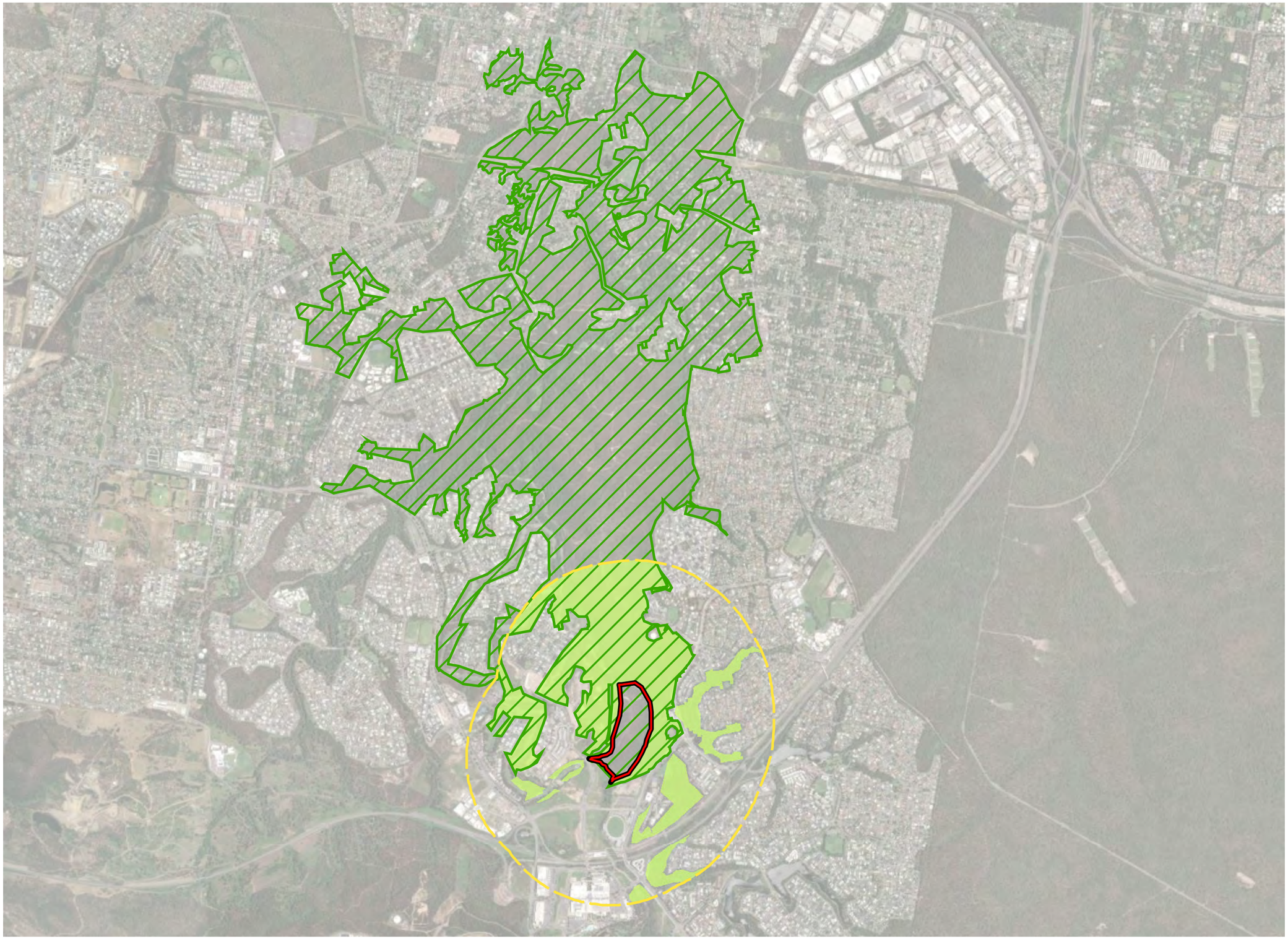
For this project, Site Condition and Site Context were given a weighted score out of three (3), while Species Stocking Rate given a weighted score out of four (4).

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.

A33. Impact Site Koala Context Assessment



Notes:
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Legend

- Referral Area
- 1km Referral Area Buffer
- Size of Koala critical habitat patch adjoining referral area (878.4 ha)
- Percentage of Koala critical habitat within 1km of referral area (34.3%)
- Percentage of referral area boundary length supporting a Koala critical habitat connection off and on site (96.3%)

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

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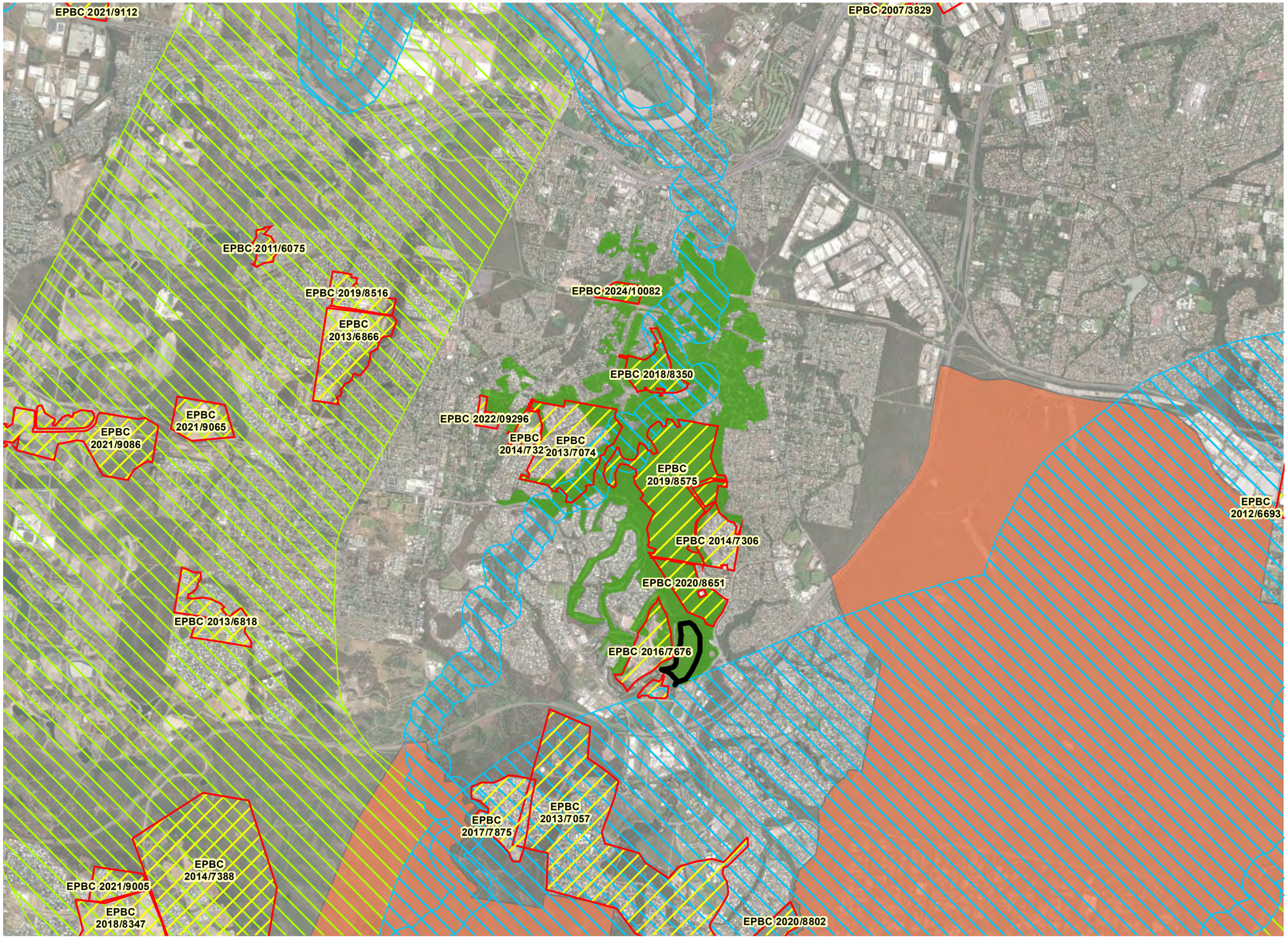
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A34. Ecological Corridors



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Legend

- Referral Area
- Habitat Connectivity
- Surrounding EPBC Referrals
- SEQ Regional Plan 2017 Regional Biodiversity Corridor

Statewide Corridor Buffers

- Regional Significance
- State Significance

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

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4.4.3 Discussion

A total of three (3) MHQA transects were conducted across the vegetation community on-site, described as remnant RE12.9-10.2. The averages of the transects were taken achieve a single site condition score for the site.

The habitat quality scores for each assessment unit, combining Site Condition, Site Context and Species Stocking Rate are reported in **Table A23** and **Table A24.** 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. The site was given an overall weighted habitat quality score of **6.25 out of 10**.

Site Condition (30%)

The vegetation community on-site achieved an average score for Site Condition **1.71 out of 3** (refer **Table A23**). The transects generally scored poorly for large trees per ha, coarse woody debris, native perennial grass cover and non-native plant cover and scored moderately for species richness of shrubs, grasses and forbs. Refer to **Photo sets 3 to 5** for photos facing north, south, east and west captured at the 50 m transect mark. The raw transect data for the impact area is located at **Attachment A8**.

Site Context (30%)

Combining each attribute below, site context scored **2.25 out of 3**.

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 878.4 ha (greater than 200 ha as per the *Queensland BioCondition Assessment* methodology (refer **Plan A33**).

While bushland on-site is presently connected to remnant vegetation north and south of the site, the lots to the north are undergoing EPBC Act assessments (EPBC 2019/8575 and EPBC 2020/8651) (refer **Plan A2**). Following the commencement of clearing of the lots to the north, the site will be further fragmented from potential habitat. Remaining linkages will be limited to Opossum Creek Corridor to the north and north-east which connect through to a State significant ecological corridor (refer **Plan A34**).

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 96.30%, and

consequently this attribute scored a **5 out of 5** as per the *Queensland BioCondition Assessment* methodology (refer **Plan A33**).

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 34.30%, and therefore the context attribute achieved a score of **4 out of 5** as per the *Queensland BioCondition Assessment* methodology (refer **Plan A33**).

Ecological Corridors

GIS mapping was utilised to identify the site's role in any ecological corridors on or adjacent to the site (refer **Plan A34**). The site shares a boundary with a state wide ecological corridor buffer. Therefore, this attribute was scored **4 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**. This score was assigned as the site is considered to contain critical habitat for the Koala (as per the EPBC referral determination).

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 proximity to main roads due to the risk of motor vehicle strike, as well as predation by wild or domestic dogs. This attribute was scored a **7 out of 15** indicating a moderate level of threats.

The risk of motor vehicle strike to Koalas on or adjoining the site would be relatively high as the site is bound by Springfield Parkway to the east 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 (refer **Plan A29**). One (1) is located approximately 900 m south-east of the site and the other approximately 1.5 km south-west, both in proximity to the Centenary Highway.

It is noted that anticipated growth and planned residential development throughout Springfield Central 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 was recorded during field survey. The site is utilised by members of the public to walk their domestic dogs, where the presence of dogs can deter Koala presence (DEHP, ND). Due to the situation of the site abutting extensive residential estates, and with modified bushland to the west associated with industrial and extractive resource uses, access to the site by wild dogs or those off-leash is considered an increased risk to Koala mortality.

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.

Species mobility capacity for the Koala on-site was assigned the moderate score of **7 out of 10**. While bushland on-site is presently connected to bushland north and south of the site, two (2) EPBC Act determinations exist across the bushland adjoining the site to the north and south. In addition, Springfield Anglican College, residential developments and Springfield Parkway disconnect the site to the north, west and south-east. Following the commencement of clearing of these lots to the north 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 Opossum Creek.

Species Stocking Rate (40%)

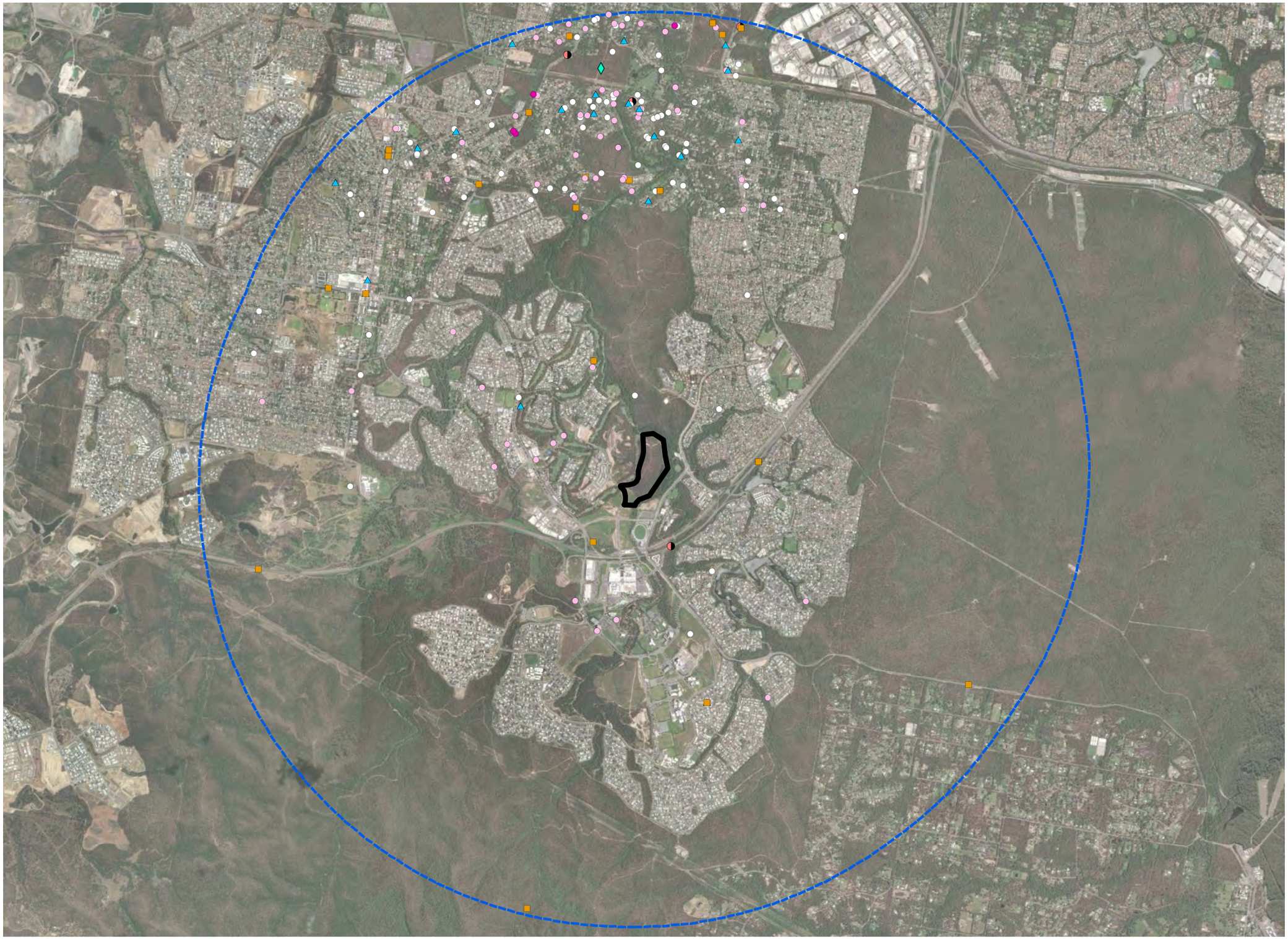
The final component of the MHQA technique is species stocking rate. Species stocking rates are estimates of the Koala carrying capacity of the site at the time of undertaking the survey. A species stocking rate score of **40 out of 70** was attributed to the site for a score of **2.29 out of 3**. This was largely attributed to the fact that that presence was confirmed on-site, the site contains breeding habitat and a low evidence of usage was identified as confirmed through SAT surveys and supported by spotlighting and RPA wildlife aerial thermal surveys (refer **Table A24**).

Results of Koala specific SAT surveys are provided in **Table A10**.

Summary

To summarise, the action is considered to impact on moderate quality Koala habitat, however, not on an important Koala population, having a total impact of **6.25 out of 10** (refer **Table A23**). 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 north-west and southern land parcels. Substantial avoidance, management and mitigation measures are considered to result in a manageable impact on Koala habitat in the context of the Springfield Central 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.

A35. Koala Hospital Records



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Legend

- Referral Area
- 5km Referral Area Buffer
- Major and arterial roads

Qld Koala hospital records

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

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 250 500 750 1,000 m

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North



South



East



West



Photo set 3: AU1 – Transect 1 centre photos

North



South



East



West



Photo set 4: AU1 – Transect 3 centre photos

North



South



East



West



Photo set 5: AU1 – Transect 5 centre photos

Table A23: Koala MHQA Results – Assessment Unit 1

Assessment Unit - Regional Ecosystem	Vegetation Community RE12.9-10.2						
	RE12.9-10.2 Benchmark	Transect 1	Transect 3	Transect 5	Average of Transects	% Benchmark	Score
SITE CONDITION							
Recruitment of woody perennial species in EDL	100	100	50	100	83.33	83.33	5.0
Native plant species richness - trees	6	6	8	7	7.00	116.67	5.0
Native plant species richness - shrubs	7	5	7	5	5.67	80.95	2.5
Native plant species richness - grasses	7	2	2	1	1.67	23.81	0.0
Native plant species richness - forbs	13	5	2	3	3.33	25.64	2.5
Tree canopy height (Canopy)*	21	20	24	26	23.33	111.11	5.0
Tree canopy height (Sub-canopy)*	12	8	12	12	10.67	88.89	5.0
						*Average tree canopy height score	5.0
Tree canopy cover (Canopy)**	64	64	46.2	39.1	49.77	77.76	5.0
Tree canopy cover (Sub-canopy)**	20	33.4	11.6	27.4	24.13	120.67	5.0
						**Average tree canopy cover score	5.0
Shrub canopy cover	6	2.9	5.9	2.8	3.87	64.44	5.0
Native perennial grass cover	21	2.4	1.6	1.4	1.80	8.57	0.0
Organic litter	48	87.96	93.8	93.8	91.85	191.36	5.0
Large trees (euc plus non-euc) (per ha)	38	4	8	0	4.00	10.53	5.0
Coarse woody debris (per ha)	506	219	95	112	142.00	28.06	2.0
Non-native plant cover	0	12	18	9	13.00	13.00	5.0
Quality and availability of food and foraging habitat	NA	5	5	5	5.00	-	5.0
Quality and availability of shelter	NA	5	5	5	5.00	-	5.0
						Transect Site Condition Score (/100)	57
						Overall Site Condition Score - out of 3	1.71
SITE CONTEXT							
Size of patch	10	10	10	10	10		10

Assessment Unit - Regional Ecosystem	Vegetation Community RE12.9-10.2						
	RE12.9-10.2 Benchmark	Transect 1	Transect 3	Transect 5	Average of Transects	% Benchmark	Score
Connectedness	**5**	5	5	5	5		5
Context	**5**	4	4	4	4		4
Ecological Corridors	**6**	4	4	4	4		4
Role of site location to species overall population in the state	**5**	5	5	5	5		5
Threats to the species	**15**	7	7	7	7		7
Species mobility capacity	**10**	7	7	7	7		7
						Site Context Score (/56)	**42**
						Overall Site Context Score - out of 3	**2.25**
SPECIES STOCKING RATE							
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	**40**	40	40	40	40		**40**
						Species Stocking Rate (/70)	**40**
						Overall Species Stocking Rate Score - out of 4	**2.29**
						Overall Assessment Unit Score	**6.25**

Table A24: Koala Species Stocking Rate Results

Species Stocking Rate Table	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10 (detected on-site)
Species usage of the site (habitat type and evidenced usage)	15/15 (breeding habitat)
Approximate density (per ha)	10/30 (low density)
Role / importance of species population on site*	5/15 (precautionary approach – key source population for dispersal)
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

4.5 Grey-headed Flying-fox

4.5.1 Assessment Methodology

The action proposes to impact of **18.90 ha** of vegetation that is identified as critical habitat for the Grey-headed Flying-fox. The impact and the offset sites have 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:

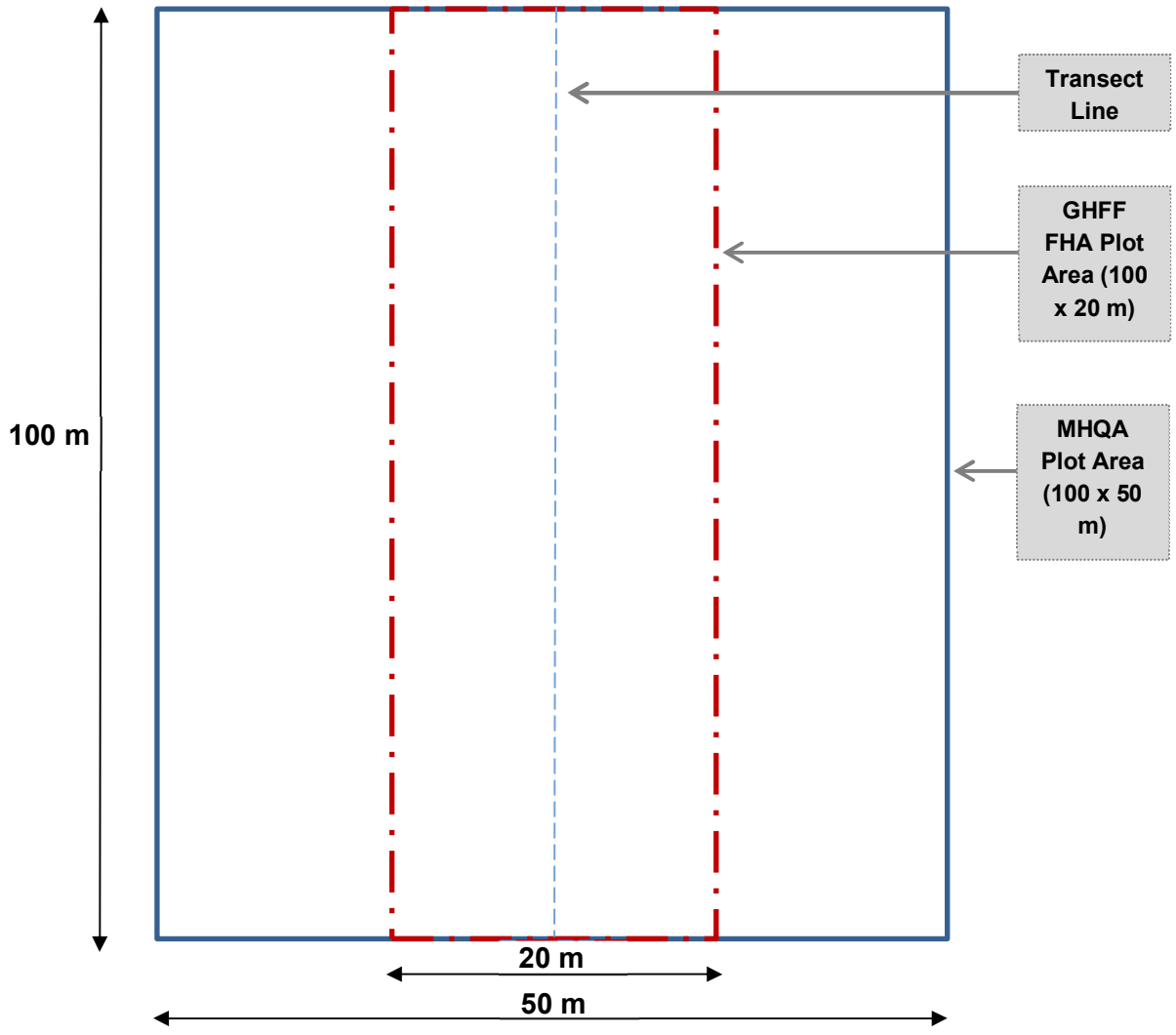
- Vegetation condition;
- Species richness (canopy trees);
- Flower scores (average);
- Timing of biological shortages;
- Quality of foraging habitat (trees >0.65 wt p*r); and
- Non-native plant cover.

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 A25** 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. It should be noted that non-GHFF foraging species are also documented. Refer to **Table A26** 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, 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 flower score of the recorded canopy species. The individual score for each flowering GHFF foraging tree is then divided by the number of species recorded (GHFF foraging and non-GHFF foraging trees) to produce an average. The benchmark values for this condition characteristic have been derived from the findings published by Eby and Law (2008) (*Ranking the feeding habitat of Grey-headed flying foxes for conservation management*). Refer to **Table A27** 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). It should be noted that this condition characteristic is weighted and 'food shortages' has been weighted heavier than the balance of the characteristics which are equal, as 'food shortages' is recognised as a major issue. Refer to **Table A28** for the benchmark scoring values for this condition characteristic.
- *Quality of foraging habitat* – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE, 2017) and determining which canopy species recorded contain a flower score greater than 0.65 wt p*r and is recognised as a significant food plant by Eby and Law (2008). It should be noted that species recorded that are not prescribed a value by Eby and Law (2008) but are recognised as GHFF foraging trees, have been given an average weighted value of related species or, in the case of *Eucalyptus crebra* (Narrow-leaved Ironbark) been prescribed a value of 0.65 and classified as a significant food plant given its importance as a winter flowering species as acknowledged in the *Draft Recovery Plan for the Grey-headed Flying-fox* (DoEE, 2017). Refer to **Table A29** 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 cover of exotic species over the 100 m X 20 m plot. Refer to **Table A30** for the benchmark scoring values for this condition characteristic.

It should be noted that for on-ground assessment purposes, the 100 m X 20 m plot utilised for the GHFF FHA overlaps with the on-ground condition characteristics of the Koala MHQA. Refer to the **Insert 1** below for location of GHFF FHA within the MHQA Plot.



Insert 2: MHQA and GHFF FHA Plot Location Diagram

Site Context (30 %)

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

- Size of patch;
- Connectedness (active GHFF roost camps in a 20 km radius);
- Context (percentage of GHFF foraging habitat in a 20 km radius);
- Ecological corridors;
- Role of site location to species overall population in the state (active GHFF 'level 3' roost camps in a 20 km radius as shown on the national flying-fox monitoring viewer); 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 A29** for the benchmark scoring values for this context characteristic.
- *Connectedness* – This context characteristic is assessed by analysing the number of active GHFF roost camps (over the most recent monitoring period (8/23 – 8/24)) within a 20 km radius of the site. For consistency purposes this assessment is to utilise the data provided on the National Flying-fox Monitoring Viewer (Australian Government). Refer to **Table A32** 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 A33** for the benchmark scoring values for this context characteristic.
- *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 A34** 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. Refer to **Table 34** 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 determining the number of active GHFF roost camps level 3 or greater (over the most recent monitoring period (8/23 – 8/24)) within a 20 km radius of the site. For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government). Refer to **Table A36** 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.

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). It is noted that the methodology detailed in Neldner et al. (2019) uses a plot area of 50 X 10 m. For the purposes of this assessment, the area was modified to 100 X 20 m to align with the MHQA plot, however, the actual count assessment method remains the same.

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 produce a stem density per ha. This number is then compared to the benchmark stem density per ha based on the sum of the T1 and T2 stem densities for RE12.9-10.2 and RE12.9-10.19. Based on the technical descriptions, the average stem density taken as the sum of T1 and T2 is calculated as 240 per ha for RE12.9-10.2 and 340 for RE12.9-10.19. Refer to **Table A37** for benchmark scoring values for species stocking rate.

The species stocking rate scoring was determined by analysing the Technical Descriptions of Regional Ecosystems of Southeast Queensland (Ryan, 2019) and the stem density per hectare associated with the technical description of the regional ecosystem.

Table A25: GHFF FHA Vegetation Condition Scoring

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

Table A26: 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 A27: 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 A28: 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 A29: 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 A30: 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 A31 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 A32: 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 A33: 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 A34: GHFF FHA Ecological Corridors Scoring

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

Table A35: 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 A36: 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	2 – 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius
10	> 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius

Table A37: GHFF Species Stocking Rate Scoring

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

4.5.2 Discussion

Results of the GHFF FHA using methodology detailed in **Section 4.5.1** are shown in **Table A38**. The impact site attained a score of **5.60** (6.0) out of **10**. Refer to **Plan A17** for the Grey-headed Flying-fox context assessment. The raw transect data for the impact area is located at **Attachment A8**.

Table A38: Grey-headed Flying-fox – Foraging Habitat Assessment Tool Results

Site Reference		**Maximum Score**	**AU1 – Remnant (RE12.9-10.2)**	
Site Condition (40%)	Vegetation Condition	**20**	20	This AU is mapped as Category B (remnant).
	Species Richness	**20**	10	*Corymbia citriodora* (T1, T3, T5) *Corymbia tessellaris* (T3) *Eucalyptus crebra* (T1, T3, T5) *Eucalyptus moluccana* (T1, T3) *Eucalyptus tereticornis* (T3, T5) *Eucalyptus fibrosa* (T3) *Lophostemon suaveolens* (T3, T5) *Corymbia intermedia* (T3) Average = 6 GHFF species

Site Reference		Maximum Score	AU1 – Remnant (RE12.9-10.2)	
	Flower Score	**10**	5	*Eucalyptus crebra* - 0.65 *Eucalyptus tereticornis* - 0.625 *Eucalyptus moluccana* - 0.5 *Eucalyptus fibrosa* - 0.54 *Lophostemon suaveolens* - 0.46 *Angophora leiocarpa* - 0.35 *Corymbia tessellaris* - 0.40 *Corymbia intermedia* - 0.86 *Corymbia citriodora* - 0.65 *Acacia disparrima* - 0.0 *Acacia leiocalyx* - 0.0 *Acacia littoralis* - 0.0 *Alphitonia excelsa* - 0.0 Average = 0.39
	Timing of Biological Shortages	**10**	10	The species listed above cover all biological shortages
	Quality of Foraging Habitat	**20**	5	*E. crebra, C. citriodora* and *C. intermedia* are considered significant GHFF foraging species (>0.65 wt p*r)
	Non-native Plant Cover	**20**	10	Transect 1 - 12% Transect 3 - 18% Transect 5 - 9% Average = 13%
	Site Condition Score	**100**	**60**	
	Site Condition Score - out of 4	**4.00**	**2.40**	
Site Context (30%)	Size of patch	**10**	10	The size of patch of the site is greater than 200 ha.
	Connectedness	**10**	10	There are 10 active GHFF camps within a 20km radius of the site: ▪ Nationally Important Mount Ommaney, Westlake Drive (400) ▪ Camira, Barbara Street (140) ▪ Warana Court, Boronia Heights (848) ▪ Bundamba, Paice Street (574) ▪ Parkinson, Avondale Crescent (419)

Site Reference		Maximum Score	AU1 – Remnant (RE12.9-10.2)	
				▪ Goleby Avenue, Queens Park (595) ▪ Yamanto (479) ▪ Woodend (191) ▪ Beryl Roberts Park, Coopers Plains (745) ▪ Sunnybank, Les Atkinson Park (452)
	Context	**10**	3	There is approximately 33.8% GHFF foraging habitat within a 20 km radius of the site.
	Ecological Corridors	**10**	6	The site shares a common boundary with a state wide ecological corridor buffer.
	Role of site location to species overall population in the state	**10**	6	There are three 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 based on the presence of barbed wire fencing.
	Site Context Score	**60**	**40**	
	Site Context Score - out of 3	**3.00**	**2.00**	
Species Stocking Rate (30%)	GHFF Foraging Tree Density		Transect 1 - 550 stems per ha Transect 3 - 285 stems per ha Transect 5 - 225 stems per ha Average = 353 stems per ha	
	Species Stocking Rate Score	**10**	4	
	Species Stocking Rate Score - out of 3	**3.00**	**1.20**	
Total			**5.60**	

4.6 White-throated Needletail

There is no adopted Recovery Plan for this species 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.

With reference to the information provided in **Section 3.3.3**, specifically the abundance, distribution, ecology and habitat preference, the proposed impact area, and off-site retention areas in the adjacent corridor that will remain into perpetuity and managed by Council, a significant residual impact on the White-throated Needletail resulting from this development is considered unlikely.

4.6.1 Significant Impact Assessment

The following provides a significant impact assessment to understand the proposed actions potential impact on the White-throated Needletail. Refer to **Table A39** for assessment against the SIG 1.1.

Table A39: EPBC Act Significant impact criteria for vulnerable species – White-throated Needletail

Significant Impact Criteria	Assessment	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population	Potential foraging habitat for the White-throated Needletail is located on-site in the form of remnant vegetation. White-throated Needletails being highly mobile and being almost exclusively aerial including while foraging, are unlikely to focus solely on one area of habitat. Large areas of potential foraging and roosting habitat are located within the nearby protected areas including White Rock Conservation Area, White Rock-Spring Mountain Conservation Estate and Greenbank Military Training Area. The proposed development is unlikely to have a significant impact on the ability of White-throated Needletails to forage or roost in the landscape and, therefore; is not anticipated to lead to a long-term decrease in the size of an important population.	Significant impact not likely
Reduce the area of occupancy of an important population of the species	White-throated Needletails are predominantly aerial, however, will roost in eucalypt woodland. White-throated needletails are known to occur within the locality with several records within the landscape, however, it is considered that the large areas of available habitat in the locality such as the contiguous, protected areas of vegetation located to the west, south and east of the site would be used preferentially to the vegetation on-site for foraging and roosting. The area of occupancy of the White-throated Needletail is not anticipated to be significantly reduced as a result of the proposal due to the highly mobile nature of the species and location of large areas of contiguous habitat within the locality.	Significant impact not likely
Fragment an existing important population into two or more populations	White-throated Needletails are highly mobile and therefore do not require connected vegetation for dispersal. The proposed development will not fragment an existing population.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
Adversely affect habitat critical to the survival of a species	The proposed development will remove potential foraging habitat for the White-throated Needletail, however, however, given the highly mobile nature of the species and presence of large areas of suitable habitat in the locality such as within White Rock Conservation Area, White Rock-Spring Mountain Conservation Estate and Greenbank Military Training Area, it is not considered that the proposal will adversely affect habitat that is considered critical to the survival of the species.	Significant impact not likely
Disrupt the breeding cycle of an important population	The White-throated Needletail breeds in East Asia. Therefore, the proposed development will not affect the breeding cycle of the White-throated Needletail.	Significant impact not likely
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The White-throated Needletail is highly mobile and is able to forage over large expanses, thus reducing the individual importance of selected habitat fragments. The surrounding locality contains substantial habitat areas within protected estates which would adequately fulfil the foraging requirements of the species. As the proposed development proposes impacts to marginal vegetation that the species may forage over, it is unlikely that the species would decline as a result of the proposed development.	Significant impact not likely
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	It is unlikely the proposed development would introduce an invasive species that would harm or displace the White-throated Needletail.	Significant impact not likely
Introduce disease that may cause the species to decline	It is unlikely the proposed development would introduce disease that would harm the White-throated Needletail.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
	According to the *Hirundapus caudacutus* Conservation Advice (TSSC, 2019), recovery actions within Australia focus on identifying areas of vegetation to protect that may provide important foraging and roosting habitat.	
Interfere substantially with the recovery of the species	The proposed development will remove an area of potential foraging habitat for the White-throated Needletail; however, it is unlikely to form important foraging and roosting habitat given the proximity to development and infrastructure. Due to the highly mobile nature of the species and the presence of large areas of protected and higher quality habitat areas in the locality such, it is not considered that the proposal will interfere substantially with the recovery of the species.	Significant impact not likely

4.7 Swift Parrot

4.7.1 Foraging Habitat Assessment

To quantify habitat value for the Swift Parrot, a feature-based assessment method was utilised. The method involves calculating the number of individual habitat features to be impacted.

A habitat feature for the Swift Parrot is defined as a non-juvenile tree (*i.e.,* ≥100 mm DBH) which is a preferred foraging tree species identified under the *National Recovery Plan for the Swift Parrot* (DCCEEW, 2024). Listed preferred foraging tree species include:

- *Eucalyptus leucoxylon* (yellow gum)
- *Eucalyptus tricarpa* (red ironbark)
- *Eucalyptus sideroxylon* (mugga ironbark)
- *Eucalyptus macrocarpa* (grey box)
- *Eucalyptus albens* (white box)
- *Eucalyptus melliodora* (yellow box)
- *Eucalyptus robusta* (swamp mahogany)
- *Eucalyptus tereticornis* (forest red gum)
- *Eucalyptus pilularis* (blackbutt)
- *Corymbia maculata* (spotted gum). It is noted that in Queensland *Corymbia citriodora* is recognised synonymously with *Corymbia maculata*.

The baseline density of all trees including preferred foraging trees was extrapolated from stem density data collected at two (2) MHQA transects within AU 1 described as Remnant RE12.9-10.2 (refer **Plan A3**).

Stem density data at each MHQA transect was collected in accordance with 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). The methodology detailed in Neldner et al. (2019) uses a plot area of 50 X 10 m. For the purposes of this assessment, the area was modified to 100 X 20 m to align with the MHQA plot, however, the actual count assessment method remains the same (refer plot design in **Insert 1**). This methodology involves counting the number of individual non-juvenile tree specimens within each 100 m X 20 m plot (0.2 ha) including those that are listed as preferred foraging species for the Swift Parrot. A tree that branches into two or more stems 30 cm above the ground is counted as one individual.

For each AU, the number of non-juvenile trees and separately, of non-juvenile preferred foraging trees, was averaged across all habitat quality transects within the corresponding AU to produce the mean number of trees and preferred foraging trees within a 100 X 20 m plot area (0.2 ha), the same as that used for the GHFF FHA (refer plot design in **Insert 1**). The average stem density of non-juvenile trees and non-juvenile preferred foraging trees recorded within the 0.2 ha plot was multiplied by five (5) to produce an estimate of the number of trees and preferred foraging trees per ha. This was then multiplied by the area of the AU to determine an estimate of non-juvenile trees and non-juvenile preferred foraging trees within each AU.

4.7.2 Discussion

The referral area contains two (2) preferred foraging species for the Swift Parrot including *Corymbia citriodora* (Spotted Gum) and *Eucalyptus tereticornis* (Forest Red Gum). The total number of habitat features within the Peninsula Precinct referral area is **3,339**. Refer to **Table A40** for the results of the assessment. The raw transect data for the impact area is located at **Attachment A8**.

Table A40: Swift parrot feature-based assessment results

			Count of preferred foraging trees (100 X 20 m plot)					
AU	AU Area (ha)	Plot #	*Corymbia citriodora*	*Eucalyptus tereticornis*	Total	Mean number per 100 X 20 m plot	Estimate per hectare	Estimate per AU
1	18.9	1	39	8	47	35.33	176.67	3339
1		3	27	5	32			
1		5	20	7	27			
							Total site (18.9 ha)	3,339
							Total impacted (18.9 ha)	3,339

4.7.3 Significant Impact Assessment

An assessment against the Significant Impact Guidelines 1.1 has been completed for the Swift Parrot. Refer to **Table A40** for assessment against the SIG 1.1.

Table A41: EPBC Act Significant impact criteria for critically endangered or endangered species – Swift Parrot

Significant Impact Criteria	Assessment	Impact
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:		
1. Lead to a long-term decrease in the size of a population	The proposed action will result in the removal of potential foraging habitat for the Swift Parrot including winter flowering eucalypt species, namely *Eucalyptus fibrosa, Corymbia citriodora* and *E. tereticornis,* the latter two (2) of which are identified as preferred foraging species for the species. While habitat clearing for development is identified as a threat to the species (DCCEEW, 2024), it is not known the extent to which this process in Queensland contributes to the decline of the species or its relative abundance within the Queensland range. Queensland does not contain any Key Biodiversity Areas for the species, with critical areas for the species located within New South Wales, Victoria and Tasmania. The site also contains only two (2) of the ten (10) preferred foraging species (DCCEEW, 2024), and large areas of potential foraging resources are highly abundant within the landscape including the Greenbank Military Training Area, Flinders-Karawatha Bioregional Corridor and White Rock Conservation Park (refer **Plan A7**), therefore the removal of vegetation on-site is not considered to impede foraging potential at the local or landscape scale. It is considered unlikely that the proposed development will result in a decline of the species.	Significant impact not likely
2. Reduce the area of occupancy of the species	The proposed development will result in the removal of preferred foraging habitat for the species including *Corymbia citriodora* and *E. tereticornis*. While swift parrots were not recorded on-site despite extensive surveys, the presence of foraging habitat and recent evidence of foraging activity in the locality, it is considered that the removal of potential habitat may reduce the area of potential occupancy for the species.	**Potential for significant impact**
3. Fragment an existing population into two or more populations	The swift parrot is highly mobile and foraging habits of the species are difficult to predict. Due to the highly mobile nature of the species, the dispersal capability is unlikely to be impacted by the removal of potential foraging habitat.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
4. Adversely affect habitat critical to the survival of a species	Under to the *National Recovery Plan for the Swift Parrot Lathamus discolor* (DCCEEW, 2024), habitat critical to the survival of a species is defined as 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; or • For the reintroduction of populations or recovery of the species or ecological community. The Recovery Plan identifies that within Queensland this includes "all preferred foraging species within known and likely foraging habitat on the mainland including Yellow Gum (*E. leucoxylon*), Red Ironbark (*E. tricarpa*), Mugga Ironbark (*E. sideroxylon*), Grey Box (*E. macrocarpa*), White Box (*E. albens*), Yellow Box (*E. melliodora*), Swamp Mahogany (*E. robusta*), Forest Red Gum (*E. tereticornis*), Blackbutt (*E. pilularis*), and Spotted Gum (*Corymbia maculata*)." The site contains potential winter foraging resources (*i.e.,* with suitable phenological characteristics) which may potential provide foraging resources during the winter foraging season, however, the site contains only two (2) of the ten (10) preferred foraging species including *E. tereticornis* and *Corymbia citriodora* (northern species of spotted gum).	**Potential for significant impact**
5. Disrupt the breeding cycle of a population	The Swift Parrot breeds exclusively in Tasmania during the Australian summer. Therefore, the proposed development will not affect the breeding cycle of the Swift Parrot.	Significant impact 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	The proposed development will remove potential foraging habitat for the swift parrot in the form of winter flowering eucalypt trees, namely *C. citriodora* and *E. tereticornis*. However, the locality contains larger, more contiguous areas of similar vegetation communities within White Rock Conservation Park and the Flinders-Karawatha Bioregional Corridor that are likely to be used preferentially to the vegetation on-site. Due to the abundance of resources within the broader	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
	landscape and SEQ generally, it is unlikely that the removal of vegetation on-site will contribute to the decline of the Swift Parrot.	
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	There are no known invasive species that are directly harmful to the swift parrot. It is unlikely that the proposed action will introduce invasive species that are harmful to the Swift Parrot.	Significant impact not likely
8. Introduce disease that may cause the species to decline	Psittacine beak and feather disease (PBFD) is an existing disease present among Swift Parrots and parrots generally. Transmission of the disease occurs within wild populations of parrots. The risk of spread of disease may only be tempered by a successful implementation of a Threat Abatement Plan including administering of a vaccine among wild and captive parrots to reduce incidence of the disease in wild populations and captive breeding programs (DCCEEW, 2021). There are no other diseases known to affect the species.	Significant impact not likely
9. Interfere substantially with the recovery of the species	Several threats to the Swift Parrot are identified in the National Recovery Plan which includes habitat loss and alteration in both breeding and foraging ranges (DCCEEW, 2024). In particular, the loss of breeding habitat remains a significant threat to the continued persistence of the species (DCCEEW, 2024). The *National Recovery Plan for the Swift Parrot Lathamus discolor* (DCCEEW, 2024) identifies several actions and performance criteria that work toward the recovery of the species. Key actions include the management and protection of known breeding and foraging habitat at the local, regional and landscape scale, reducing sugar glider predation at breeding sites, understanding population dynamics and monitoring threats and other sources of mortality. While habitat clearing for development is identified as a threat to the species (DCCEEW, 2024), it is not known the extent to which this process in Queensland has or is contributing to the decline of the species or its relative abundance within the Queensland range. The impact of clearing is	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
	disproportionately represented by breeding areas which are identified as "scarce and fragmented" in the Recovery Plan. Additionally, key threats to the species occur only in breeding habitat (*i.e.,* predation by sugar gliders) which is acknowledged to affect breeding success for the species and declines for the species. It is considered that the extent to which clearing for urban development in foraging habitat contributes to declines in the species is reduced compared to the same impacts in areas of key breeding habitat. Additionally, Queensland does not contain any Key Biodiversity Areas for the species, with critical areas for the species located within New South Wales, Victoria and Tasmania. The site also contains only two (2) of the ten (10) preferred foraging species (DCCEEW, 2024), and large areas of potential foraging resources are highly abundant within the landscape including the Greenbank Military Training Area, Flinders-Karawatha Bioregional Corridor and White Rock Conservation Park and SEQ region (refer **Plan A7 and Plan A8**), the volume of clearing on-site is not considered to be of a scale that would impede the capacity for foraging within the locality. The removal of vegetation will reduce the extent of potential foraging resources; however, it is not considered that the development will interfere substantially with the recovery of the species.	
Conclusion	**Potential for significant impact**	

4.8 Regent Honeyeater

4.8.1 Critical Habitat Analysis

To quantify habitat value for the Regent Honeyeater, a feature-based assessment method was utilised. The method involves calculating the number of individual habitat features to be impacted.

A habitat feature for the Regent Honeyeater is defined as a non-juvenile tree (*i.e.,* ≥100 mm DBH) which is a preferred foraging tree species identified under the *National Recovery Plan for the Regent Honeyeater* (DoE, 2016). Listed preferred foraging tree species include:

- *Eucalyptus leucoxylon* (Yellow Gum)
- *Eucalyptus sideroxylon* (Mugga Ironbark)
- *Eucalyptus albens* (White Box/Thin-leaved Stringybark)
- *Eucalyptus melliodora* (Yellow Box)
- *Eucalyptus robusta* (swamp mahogany)
- *Corymbia maculata* (Spotted Gum). It is noted that in Queensland *Corymbia citriodora* is recognised synonymously with *Corymbia maculata*.

In addition, the Recovery Plan identifies tree species with potential to provide important nectar flows at different times of year which specifically lists *Eucalyptus fibrosa* (Broad-leaved Ironbark) and *Eucalyptus eugenioides* (Thin-leaved Stringybark). These species were also considered in the analysis, identified as 'supporting species', however, were weighted at 0.75 in the stem counts noting their reduced importance relative to the listed preferred foraging species.

The baseline density of all trees including preferred foraging trees was extrapolated from stem density data collected at two (2) MHQA transects within AU 1 described as Remnant RE12.9-10.2 (refer **Plan A3**).

Stem density data at each MHQA transect was collected in accordance with 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). The methodology detailed in Neldner et al. (2019) uses a plot area of 50 X 10 m. For the purposes of this assessment, the area was modified to 100 X 20 m to align with the MHQA plot, however, the actual count assessment method remains the same (refer plot design in **Insert 1**). This methodology involves counting the number of individual non-juvenile tree specimens within each 100 m X 20 m plot (0.2 ha) including those that are recognised as preferred or supporting foraging species for the Regent Honeyeater. A tree that branches into two or more stems 30 cm above the ground is counted as one individual.

For each AU, the number of non-juvenile trees and separately, of non-juvenile preferred and supporting foraging trees, was averaged across all habitat quality transects within the corresponding AU to produce the mean number of trees and preferred foraging trees within a 100 X 20 m plot area (0.2 ha), the same as that used for the GHFF FHA (refer plot design in **Insert 1**). The average stem density of non-juvenile trees and non-juvenile preferred foraging trees recorded within the 0.2 ha plot was multiplied by five (5) to

produce an estimate of the number of trees and preferred foraging trees per ha. This was then multiplied by the area of the AU to determine an estimate of non-juvenile trees and non-juvenile preferred and supporting foraging trees within each AU.

4.8.2 Discussion

The referral area contains one (1) preferred foraging species for the Regent Honeyeater being *Corymbia citriodora* (Spotted Gum) with one (1) supporting foraging species *Eucalyptus fibrosa* (Broad-leaved Ironbark) The total number of habitat features within the Peninsula Precinct referral area is **2,756** inclusive of a 0.75 weighting for *Eucalyptus fibrosa*. Refer to **Table A40** for the results of the assessment. The raw transect data for the impact area is located at **Attachment A8**.

Table A42: Regent Honeyeater feature-based assessment results

			Count of preferred foraging trees (100 X 20 m plot)						
AU	AU Area (ha)	Plot #	*Corymbia citriodora*	*Eucalyptus fibrosa*	Eucalyptus fibrosa (0.75 weighting)	Total (0.75 weighting)	Mean number per 100 X 20 m plot	Estimate per hectare	Estimate per AU
1	18.9	1	39	0	0	39	29.17	146	2756
1		3	27	2	1.5	29			
1		5	20	0	0	20			
								Total site (18.9 ha)	2,756
								Total impacted (18.9 ha)	2,756

4.8.3 Significant Impact Assessment

An assessment against the Significant Impact Guidelines 1.1 has been completed for the Regent Honeyeater. Refer to **Table A42** for assessment against the SIG 1.1.

Table A43: EPBC Act Significant impact criteria for critically endangered or endangered species – Regent Honeyeater

Significant Impact Criteria	Assessment	Impact
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:		
1. Lead to a long-term decrease in the size of a population	The proposed development will result in the removal of potential foraging habitat including winter flowering eucalypt species. *National Recovery Plan for the Regent Honeyeater (Anthochaera phrygia)* (DoE 2016) lists key tree species as Mugga Ironbark (*E. sideroxylon*), White Box (*E. albens*), Yellow Box (*E. melliodora*), Yellow Gum (*E. leucoxylon*), Swamp Mahogany (*E. robusta*) and Spotted Gum (*Corymbia maculata*). The site contains one (1) of the six (6) preferred foraging species (Corymbia citriodora/C. maculata). While habitat clearing for development is identified as a threat to the species (DoE 2016), it is not known the extent to which this process in Queensland contributes to the decline of the species or its relative abundance within the Queensland range. Queensland does not contain any key areas for the species with critical areas for the species located within New South Wales and Victoria only. The site also contains only one (1) of the six (6) preferred foraging species (DoE 2016)and large areas of potential foraging resources are highly abundant within the landscape including the Greenbank Military Training Area, Flinders-Karawatha Bioregional Corridor and White Rock Conservation Park (refer **Plan A7**), therefore the removal of vegetation on-site is not considered to impede foraging potential at the local or landscape scale. It is considered unlikely that the proposed development will result in a decline of the species.	Significant impact not likely
2. Reduce the area of occupancy of the species	The proposed development will result in the removal of potential foraging habitat including winter flowering eucalypt species including key species *Corymbia citriodora* and *Eucalyptus fibrosa*. While regent honeyeaters were not recorded on-site despite extensive surveys, the presence of foraging habitat and recent evidence of foraging activity in the locality, it is considered that the removal of potential habitat may reduce the area of potential occupancy for the species.	**Potential for significant impact**

Significant Impact Criteria	Assessment	Impact
3. Fragment an existing population into two or more populations	The Regent Honeyeater is highly mobile and foraging habits of the species are difficult to predict. Due to the highly mobile nature of the species, the dispersal capability and population dynamics are unlikely to be impacted by the removal of potential foraging habitat.	Significant impact not likely
4. Adversely affect habitat critical to the survival of a species	The *National Recovery Plan for the Regent Honeyeater (Anthochaera phrygia)* (DoE, 2016) defines habitat critical to the survival as: • Any breeding or foraging habitat in areas where the species is likely to occur; and • Any newly discovered breeding or foraging locations. The site is located within the defined range of foraging habitat where the species is 'likely to occur' under the Recovery Plan. The site also contains potential foraging resources and foraging activity was recorded within Springfield Lakes in 2019. The removal of habitat is considered to adversely affect habitat critical to the survival of the Regent Honeyeater.	**Potential for significant impact**
5. Disrupt the breeding cycle of a population	The regent honeyeater has a patchy distribution of known breeding areas which are located in New South Wales and Victoria. The proposed development is not located within the breeding range therefore will not an impact on the breeding cycle of the Regent Honeyeater.	Significant impact 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	The proposed development will remove a portion potential foraging habitat for the regent honeyeater in the form of winter flowering eucalypt trees containing preferred foraging species *C. citriodora*. However, the locality contains larger, more contiguous areas of vegetation commnities within White Rock Conservation Park and the Flinders-Karawatha Bioregional Corridor containing vegetation communities more suitable for the species such as RE12.9-10.2 which contains *C. citriodora* as the dominant species that may be used preferentially to the vegetation on-site. Additionally, aggressive native bird species *Manorina melanocephala* (noisy miner) and *Philemon corniculatus* (noisy friarbird) which are known to use the vegetation and are likely to outcompete vagrant regent honeyeater individuals.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
	Due to the abundance of resources within the broader landscape and SEQ generally, it is unlikely that the removal of vegetation on-site will contribute to the decline of the Regent Honeyeater.	
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	Regent honeyeaters are known to experience competition from other nectivorous birds and the feral honeybee (*Apis mellifera*). Native nectivorous bird species including *Manorina melanocephala* (noisy miner), *Philemon corniculatus* (noisy friarbird) and *Anthochaera carunculata* (red wattlebird) are documented to compete with the regent honeyeater. The proposed development is located in an area where these species are common on and surrounding the site in the fragmented urban environment therefore is unlikely to significantly increase as a result of the development as they will continue to occupy the edge affected areas of retained habitat areas.	Significant impact not likely
8. Introduce disease that may cause the species to decline	There are no diseases known to affect the Regent Honeyeater. The proposed development is unlikely to introduce disease to the species.	Significant impact not likely
9. Interfere substantially with the recovery of the species	Long-term declines in the regent honeyeater population is attributed to broad-scale removal of preferred habitats (DoE 2016). As such, recovery objectives for the species have focused on identifying and protecting habitat where the species is known or likely to occur. The Recovery Plan highlights the importance of protecting high quality habitat and rehabilitating degraded habitats where the species is likely to occur. While the site is located within the foraging range for the species, it is also noted that only one (1) preferred foraging species (*Corymbia citriodora*) (DoE 2016) and regent honeyeaters prefer the wettest, most fertile sites within box-ironbark associations such as along creek flats, broad river valleys and foothills. Habitat which potentially meets this description is recorded in association with adjoining gully lines and sloping hillsides. Given the superior mobility capacity of the species and abundance of preferential habitat within close proximity of the referral area (Greenbank Military Training Area and White Rock Conservation Park located within the Flinders-Karawatha Corridor, refer **Plan A7 and Plan A10**), the volume of clearing on-site is not considered of a scale that would impede the capacity for foraging within the locality.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
	The removal of vegetation will reduce the extent of potential foraging resources, however, it is not considered that the development will interfere substantially with the recovery of the species as foraging needs can continue to be supported by the abundant foraging resources available in White Rock Conservation Park and the Flinders-Karawatha Bioregional Corridor.	
Conclusion	**Potential for significant impact**	

4.9 Greater Glider

Potential habitat suitable for the Greater Glider located within the proposed action site considered in terms of the presence of remnant vegetation containing suitable regional ecosystems for the Greater Glider (refer **Plan A23**). However, it is noted that the actual area of potential habitat may be smaller as the structural attributes of the forest overstorey and foraging quality of a given habitat area vary within a given area (Eyre 2002, DCCEEW 2022).

Despite the presence of potentially suitable habitat, the broader vegetation patch where the proposed action site is located is relatively isolated within the landscape considered in terms of functional connectivity to larger, contiguous patches of White Rock Conservation Park, Greenbank Military Training Area and White-Rock Spring Mountain Conservation Estate. Connectivity to these areas is substantially compromised as a result of the conversion of the surrounding suburbs into urban development over the past 20 years and resulting form of the retained vegetation being predominantly narrow and linear with multiple physical barriers. The lack of connection to larger, contiguous patches presents a significant ecological barrier for any form of connectivity or population persistence within and surrounding the patch in which the proposed action site is located. Locally, the vegetation on-site retains a degree of landscape connection as set out in the open space provisions of the Springfield Structure Plan including areas like the Brookwater Golf Course and connecting creek corridors including Opossum Creek and Woogaroo Creek further downstream. The connecting areas are predominantly comprised of lineal strands of retained vegetation, trees in parkland settings, newly rehabilitated vegetation which limit movement and persistence opportunities of the disturbance-sensitive Greater Glider.

Where connected lineal vegetation appears to occur within identified linkages to the proposed action site, area plans in this submission show corridors are a mix of non-remnant, regrowth or remnant vegetation mapped under the *Vegetation Management Act 1999* and vary in width from 15 m at the narrowest points up to 100 m in less disturbed areas (refer **Plan A21**). Corridor linkages are intersected and severed at multiple locations by major infrastructure including the Springfield Line rail corridor and major or minor roads, with the most significant of these being the Centenary Highway (refer **Attachment A6**).

The Conservation Advice for the *Petauroides volans* (greater glider (southern and central) – July 5, 2022, notes that '*Greater gliders disperse poorly across vegetation that is not native forest and so do not readily recolonise isolated sites*.' The land on which the project occurs has been subjected to extensive ecological survey by numerous ecological experts and has not been recorded as supporting the greater glider species. Records of expanding development zones over the past 8 years in Springfield support this finding, with the land providing only marginal aspects of Greater Glider critical habitat definitions based on the premise of one day being considered suitable to support the species. For Greater Gliders to utilise the proposed action site it is considered that recolonisation would need to occur from nearby unconnected Protected Estates and National Parks which would require the species to navigate unconnected fragments of immature vegetation, cross multiple major infrastructure corridors, navigate narrow (15 m) compromised pinch points directly adjacent to housing and roads to ultimately persist in an environment of ever-expanding city infrastructure and housing.

4.9.1 Significant Impact Assessment

The following provides a significant impact assessment to understand the proposed actions potential impact on the Greater Glider. Refer to **Table A44** for assessment against the SIG 1.1.

Table A44: EPBC Act Significant impact criteria for vulnerable species – Greater Glider

Significant Impact Criteria	Assessment	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population	The proposed action site is located on a fragmented patch of remnant eucalypt woodland. An important population is not considered to be present within the proposed action site or broader patch. While historical records are present surrounding the site, these pre-date the significant clearing and subsequent contraction of habitat areas that has occurred surrounding the site within the past 20 years. The nearest verifiable record within the past 20 years is located within the Greenbank Military Training Area vegetation areas 3 km east of the proposed action site (refer **Plan A22**). As a result of these cumulative and sequential impacts, the proposed action site is now located within a well-established residential landscape with compromised landscape-level connectivity to and from the site. This assessment is supported by ecological survey data and historical and contemporary public database records. Targeted ecological surveys completed across and adjoining the proposed action site have not detected the species. These surveys include spotlighting undertaken in accordance with the survey requirements in the *Survey Guidelines for Australia's Threatened Mammals* and *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (2018) and UAV drone surveys. Additionally, fauna spotter catcher records collated from 2017 to 2021 within the suburb Spring Mountain and Brookhaven have not detected Greater Glider (refer **Attachment A7**). While potential habitat attributes to support the Greater Glider are located on-site, it is unlikely that a population is located on or in the vicinity of the site presently or in the future. For the justification provided above, the proposed action is not likely to lead to a long-term decrease in the size of an important population.	Significant impact not likely
Reduce the area of occupancy of an important population of the species	The proposed action site is located over remnant eucalypt woodland which despite containing both potential foraging and breeding resources shares limited landscape connectivity to contiguous habitat areas where Greater Glider are known to occur.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
	As detailed above, a combination of public database records, ecological field surveys and fauna spotter catcher data collected over the past 10 years have been used to support the conclusion that an important population of Greater Glider has not been present within the proposed action site or adjoining areas for the past 20 years. Additionally, there is considered a low prospect of recolonisation of the proposed action site attributed to the compromised landscape-level connectivity. Residential areas and the location of significant infrastructure routes including the Centenary Highway and adjoining rail corridor which are located between the proposed action site and contiguous vegetation areas present a notable barrier for consistent population-level connectivity where gliding distances regularly exceed 100 m. It is unlikely that the proposed development will reduce the area of occupancy of the species.	
Fragment an existing important population into two or more populations	The proposed action site is located over remnant eucalypt woodland which despite containing both potential foraging and breeding resources shares limited landscape connectivity to contiguous habitat areas where Greater Glider are known to occur. As detailed above, a combination of public database records, ecological field surveys and fauna spotter catcher data collected over the past 10 years have been used to support the assessment that an important population of Greater Glider has not been present within the proposed action site or adjoining areas for the past 20 years. Additionally, there is considered a low prospect of recolonisation of the proposed action site attributed to the compromised landscape-level connectivity. Residential areas and the location of significant infrastructure routes including the Centenary Highway and adjoining rail corridor which are located between the proposed action site and contiguous vegetation areas present a notable barrier for consistent population-level connectivity where gliding distances regularly exceed 100 m. As a population of Greater Glider are confirmed within contiguous vegetation areas of Greenbank Military Training Area and White Rock Conservation Park (refer **Plan A7 and Plan A22**), of which the proposed action site does not function as a habitat connection, the impact to vegetation within the proposed action area is not anticipated to cause any level of fragmentation of a Greater Glider population.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
	It is not considered that the development will fragment an existing important population.	
Adversely affect habitat critical to the survival of a species	The *Petauroides volans (greater glider (southern and central) Conservation Advice* (DCCEEW, 2022) defines habitat critical to the survival of the Greater Glider as: • *large contiguous areas of eucalypt forest, which contain mature hollow-bearing trees and a diverse range of the species' preferred food species in a particular region; and* • *smaller or fragmented habitat patches connected to larger patches of habitat, that can facilitate dispersal of the species and/or that enable recolonisation; and* • *cool microclimate forest/woodland areas (e.g. protected gullies, sheltered high elevation areas, coastal lowland areas, southern slopes); and* • *areas identified as refuges under future climate changes scenarios; and* • *short-term or long-term post-fire refuges (i.e. unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonize burnt areas.* The proposed action site contains remnant eucalypt woodland containing a variety of eucalypt species and a reduced density of hollow-bearing trees (<2 per hectare). However, despite the presence of potential habitat, it is located within a fragmented patch with low recolonisation potential. A combination of public database records, ecological field surveys and fauna spotter catcher data collected over the past 10 years have been used to support the assessment that an important population of Greater Glider has not been present within the proposed action site or adjoining areas for the past 20 years. Despite the proximity of the proposed action site to known areas supporting Greater Glider (*i.e.,* White Rock Conservation Park and Greenbank Military Training Area), no records or Greater Glider have been recorded on or adjacent to the site within the past 20 years. It is considered that the capacity of the site to support Greater Glider is presently highly compromised due to the lack of suitable connecting vegetation and presence of substantial barriers and as a result, is unlikely to support a greater glider population in the future particularly as urban infrastructure projects continue to progress.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
Disrupt the breeding cycle of an important population	As detailed above, a combination of public database records, ecological field surveys and fauna spotter catcher data collected over the past 10 years have been used to support the assessment that an important population of Greater Glider has not been present within the proposed action site or adjoining areas for the past 20 years. Additionally, there is considered a low prospect of recolonisation of the proposed action site attributed to the compromised landscape-level connectivity. Residential areas and the location of significant infrastructure routes including the Centenary Highway and adjoining rail corridor which are located between the proposed action site and contiguous vegetation areas present a notable barrier for consistent population-level connectivity where gliding distances regularly exceed 100 m. Breeding individuals are expected to occur within the contiguous vegetation areas of Greenbank Military Training Area and White Rock Conservation Park of which will not be impacted by the proposed action. It is not considered that the proposed action will disrupt the breeding cycle of an important population.	Significant impact not likely
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	As detailed above, a combination of public database records, ecological field surveys and fauna spotter catcher data collected over the past 10 years have been used to support the assessment that an important population of greater glider has not been present within the proposed action site or adjoining areas for the past 20 years. Despite the proximity of the proposed action site to known areas supporting Greater Glider, no records or Greater Glider have been recorded on or adjacent to the site within the past 20 years. It is considered that the capacity of the site to support Greater Glider is presently highly compromised due to the lack of suitable connecting vegetation and presence of substantial barriers and as a result, recolonisation of the patch of a greater glider population in the future particularly is highly unlikely as urban infrastructure projects continue to progress. The vegetation within the proposed action site is functionally isolated from the contiguous vegetation areas where greater glider are known to occur (*i.e.,* White Rock Conservation Park and Greenbank Military Training Area) and as such, it is unlikely that impacts to habitat areas within the proposed action site will result in a decline of the species.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Invasive species such the feral cat (*Felis catus*) and European red fox (*Vulpes vulpes*) are identified as threats to the species. The European red fox is confirmed to occur within the proposed action site. It is considered unlikely that the proposed action will result in the introduction or increased abundance of threatened species that may harm or displace the greater glider.	Significant impact not likely
Introduce disease that may cause the species to decline	It is unlikely that the proposed development will introduce disease that may harm the species.	Significant impact not likely
Interfere substantially with the recovery of the species	There is currently no recovery strategy available 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 wildfire in greater glider habitat. The vegetation within the proposed action site is functionally isolated from the contiguous vegetation areas where greater glider are known to occur (*i.e.,* White Rock Conservation Park and Greenbank Military Training Area) and as such, no evidence of presence within the proposed action or surrounding habitat and urban dominated have been recorded within the past 20 years. It is anticipated that areas where Greater Glider are known to occur and that support a population of Greater Glider including White Rock Conservation Park and Greenbank Military Training Area will provide ongoing support for the greater glider population due to the high level of protection bestowed on these areas and high ecological and cultural value. These broad habitat areas constitute a substantial refuge area to buffer against potential climate change factors that may affect the greater glider population in the future and as a result, a scenario where the habitat on-site becomes critical for the recovery of the species is unlikely. Particularly as access to the site is presently compromised and anticipated to become further reduced as development and infrastructure projects progress within in the surrounding locality.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
	The proposed action is not suitable for the reintroduction of Greater Glider nor will it be able to aid in the recovery of the species.	
Conclusion	**Significant impact not likely** **The removal of vegetation located within the proposed action site is therefore not considered to have a significant residual impact on the Greater Glider, either through direct, indirect, facilitated or cumulative impacts.**	

4.10 Collared delma

The referral area contains macrohabitat in the form of open eucalypt woodland on Land Zones 9 and 10, however, areas of suitable microhabitat are not present within the referral area or immediate surrounding areas.

The referral area and surrounding areas lack rocky sloping terrain that allow the formation of distinct microhabitat attributes that the collared delma requires. Large areas of historical modification including ground layer disturbance are present within the referral area (refer **Plan A30**), creating a whipstick regrowth quality and simplified ground layer structure that contains minimal presence of key microhabitat attributes such as scattered surface rocks. The surrounding areas are notably highly disturbed with Brookwater Golf Course to the west, flooded gum plantation to the east and weed infested areas dominated by *Celtis sinensis* and *Pinus sp.* to the north.

This assessment gives consideration to the definition of "important habitat" for the collared delma, as per Map 6 of the *Draft referral guidelines for the nationally listed Brigalow Belt reptiles* (DCCEEW, 2023b). Important habitat for the collared delma is defined broadly as areas of suitable habitat and adjacent exposed rocky areas in Land Zones 3, 9 and 10 within the "known / likely to occur" distribution of the species on Map 6 of the Draft Referral Guidelines (DCCEEW, 2023b). In the Brisbane-Ipswich region this range is indicatively mapped to encompass the western Brisbane suburbs of Mt Crosby, Karana Downs and surrounds which includes a number of known and well-documented populations. While the extent of "known / likely to occur" extends partially south of the Brisbane River within Ipswich suburbs such as Goodna, Collingwood Park and Riverview, occurrence in this area has not been documented and is considered to instead reflect a coarse buffer from the known western Brisbane populations which has not been refined to acknowledge the location of the Brisbane River as a barrier. Notably, the referral area is located outside of the "known / likely to occur" range therefore per this definition is not by default considered important habitat for the species.

As stated above, the proposed action will not impact on any microhabitat to support the collared delma. With reference to the information provided in **Section 3.3.7**, specifically the abundance, distribution, ecology and habitat preference and historical disturbance, and the proposed retention of potential microhabitat areas as part of the development, a significant residual impact on the collared delma resulting from this development is unlikely.

Table A45 includes a significant impact assessment against the SIG 1.1 to provide further clarity on the proposed action's potential impact on the collared delma.

Table A45: EPBC Act Significant impact criteria for vulnerable species – collared delma

Significant Impact Criteria	Assessment	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Lead to a long-term decrease in the size of an important population / **Reduce the area of occupancy of an important population of the species** / **Fragment an existing important population into two or more populations**	The Commonwealth identifies that an important population is difficult to identify due to low detectability of the species and therefore the definition is extended to include areas of important habitat (DCCEEW, 2026). Important habitat for the collared delma is defined broadly as areas of suitable habitat and adjacent exposed rocky areas in Land Zones 3, 9 and 10 within the "known / likely to occur" distribution of the species on Map 6 of the *Draft referral guidelines for the nationally listed Brigalow Belt reptiles* (DCCEEW, 2023b). In the Brisbane-Ipswich region this range is indicatively mapped to encompass the western Brisbane suburbs of Mt Crosby, Karana Downs and surrounds which includes a number of known and well-documented populations. While the extent of "known / likely to occur" extends partially south of the Brisbane River within Ipswich suburbs such as Goodna, Collingwood Park and Riverview, occurrence in this area has not been documented and is considered to instead reflect a coarse buffer from the known western Brisbane populations which has not been refined to acknowledge the location of the Brisbane River as a barrier. Notably, the referral area is located outside of the "known / likely to occur" range therefore per this definition is not considered important habitat for the species. While the referral area contains macrohabitat values, potential microhabitat is not present. Notably, the site and broader locality has also been affected by historical disturbance including large, unplanned wildfires and fragmentation which degrade habitat and remove prey resources for the species. Additionally, the species has not been documented to occur within the locality despite the completion of targeted surveys within the nearby located EPBC 2019/8575 referral area (Cardo, 2014) and Spring Mountain (Austecology, 2013). The sedentary nature of this species and its sensitivity to disturbance including inappropriate fire regimes suggest a level of confidence that can be applied to these findings combined with the contemporary site surveys. It is considered unlikely that a population of collared delma is present within the referral area due to the historical disturbance and low level of documented occurrence within the locality.	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
	Noting that no areas of microhabitat will be impacted by the action and the presence of surrounding historical disturbance, it is considered unlikely that the action will decrease the size of an important population, reduce the area of occupancy of an important population or fragment an existing important population into two or more populations.	
Adversely affect habitat critical to the survival of a species	The referral area contains macrohabitat values, however, microhabitat is not present. Additionally, there is considered a reduced likelihood it is occupied by the species noting the historical inappropriate fire regimes within the referral area and broader parts of Greater Springfield, surrounding disturbance and fragmentation effects and low incidence of occurrence within the Greater Springfield locality particularly due to the species' reduced capacity for dispersal and recolonisation. As a result of these factors, there is considered a reduced likelihood that the action will adversely affect habitat critical to the survival of the species.	Significant impact not likely
Disrupt the breeding cycle of an important population	While the referral area contains macrohabitat values, potential microhabitat is not present. There is considered a reduced likelihood it is occupied by the species noting the historical inappropriate fire regimes, surrounding disturbance and fragmentation effects and low incidence of occurrence within the Greater Springfield locality, particularly due to the species' reduced capacity for dispersal and recolonisation. As a result of these factors, it is considered unlikely that the action will disrupt the breeding cycle of an important population.	Significant impact not likely
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	Suitable microhabitat to support the collared delma is not present within the referral area. As a result of this, the action is unlikely to result in the decline of the species, particularly as the potential for occurrence on the site is considered low when considering the historic disturbance, surrounding fragmentation and low incidence of records.	Significant impact not likely
Result in invasive species that are harmful to a vulnerable species	*Lantana montevidensis* which is documented to degrade microhabitat is present throughout the referral area at varying densities. Additionally, the areas adjoining he referral area to the north area dominated by heavily modified areas dominated by	Significant impact not likely

Significant Impact Criteria	Assessment	Impact
becoming established in the vulnerable species' habitat	weeds such as *Celtis sinensis*, further degrading any potential habitat. Additionally, the species is known to be vulnerable to predation by European red foxes and feral cats. European red foxes have been confirmed within the referral area through previous surveys and feral cats are likely to be present due to the location in an urban area. While microhabitat is not identified within or adjoining the referral area, weed levels are anticipated to be managed and monitored as part of a council approved Bushland Management Plan as part of approval requirements for the relevant staging phases. It is unlikely that the project will introduce or exacerbate weeds or pest levels beyond existing levels.	
Introduce disease that may cause the species to decline	There are no known diseases affecting the species. The project will follow appropriate biosecurity protocols during both construction and operation. The action is unlikely to introduce disease that may cause the species to decline.	Significant impact not likely
Interfere substantially with the recovery of the species	A recovery plan for the Queensland Brigalow Belt Reptiles, including the collared delma, has been drafted by WWF-Australia in 2006 (Richardson, 2006) as outlined by the SPRAT profile (DCCEEW, 2026). The recovery actions listed on the SPRAT include identification of threats and key habitat, research priorities, conservation and the establishment of reserves, monitoring programs and the development of management guidelines. It is unlikely that the action will impede the implementation of these actions.	Significant impact not likely
Conclusion	**Significant impact not likely**	

4.12 Indirect, facilitated and cumulative impacts

Item 4.5 of the PD Request asks to ***"Provide an assessment of the direct, indirect, consequential and cumulative impacts, including:***

a) The nature of impacts (including direct, indirect and facilitated impacts*), including timing and whether the impact is temporary or permanent.

b) 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.

c) A local and regional scale analysis of likely impacts, with reference to the project's potential contribution to cumulative impacts in the context of development patterns in the locality and region.

d) A risk assessment of potential impacts from the action that are likely to be unpredictable, severe, or irreversible.

****Note: Facilitated impacts may include (but are not limited to) the risk of injury or mortality to MNES as a result of the introduction of domestic dogs in a residential area, vehicle strike as a result of increased residential car use and/or the development of domestic pools."***

The direct, indirect and facilitated impacts have been summarised in **Table A46**. **Section 4** describes the direct impacts in detail.

Table A46: Direct, Indirect and Facilitated Impacts Summary

Construction Phase	Operational Phase (ongoing disturbance)
• Vegetation clearing • Habitat removal • Intensification of effects of fragmentation effects (*i.e.*, edge effect, habitat degradation, barrier effects) • Weed dispersal and establishment • Vehicle movements • Earthworks • Light emissions during construction • Noise and vibration • Waste disposal • Hazardous and dangerous goods • Increased human presence	• Weed incursion • Vehicle strike • Increased predation by domestic animals • Noise and light pollution • Increased human presence

4.12.1 Impacts summary

- Proposed impacts under EPBC 2020/8629 include a maximum of 18.9 ha remnant vegetation recognised as containing critical habitat for the Koala, Grey-headed flying-Fox, Swift Parrot and Regent Honeyeater.
- Remnant vegetation within the Opossum Creek corridor is proposed to be rehabilitated in accordance with council specifications (refer **Plan A1**).

4.12.2 Indirect impact analysis

A detailed description of potential indirect impacts and an analysis of their potential impacts to threatened species are included in **Table A47**.

Table A47: Indirect Impact Analysis – MNES

Indirect Impact	Koala	Grey-headed flying-fox	Swift Parrot and Regent Honeyeater
a. Disturbance from increased noise, artificial light, dust, sediment generation and other relevant stressors during construction and operation of the residential development.	<u>Noise</u> Noise levels greater than existing ambient noise levels are expected during construction within the 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 including the koala in the event they are to occur within the retained vegetation areas. Additionally, noise levels are anticipated to increase once the development is complete as there will be increased vehicular and pedestrian traffic. Road noise will be the primary source of noise impact. However, retained vegetation areas associated with Opossum Creek will be buffered by soft development uses such as street planting lasting impacts of noise on koalas resulting from the development are considered to be mitigated. <u>Artificial Light</u> Artificial light can affect both nocturnal and diurnal animals by disrupting behavioural patterns, with quality of light (e.g. wavelength, colour), intensity and duration potentially evoking different faunal responses. Impacts from increased light levels include disorientation from, or attraction toward, artificial sources of light; mortality from collisions with structures; and effects on light-sensitive cycles of species (e.g. breeding and migration for fauna and flowering in plants). An increase in artificial lighting can also affect abundance of predators. The presence and intensity of artificial light in the project area may temporarily increase during the construction phase; however, construction is anticipated to be restricted to daytime hours. Where needed, 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 the implementation of standard mitigation measures (discussed in **Section 5**), the project is likely to result in a negligible impact to any koalas in the surrounding area due to the use of light pollution during construction. Additionally, light pollution during operation will also be mitigated through design and compliance with general standards in guidelines, particularly for light required within open space areas for safety. Lighting within open space areas is to face towards the urban development and away from conservation areas and vegetation within neighbouring allotments. The implementation of best practice lighting design will ensure that any long-term impacts on impact from development lighting infrastructure will be mitigated. <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:	<u>Noise</u> 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 including the grey-headed flying-fox in the event they were to forage proximal to the project area. Additionally, noise levels are anticipated to increase upon completion of the development due to an increase in vehicular and pedestrian traffic. It is unlikely that the increase will be significant to what the current surrounding developments exude. Further, as the grey-headed flying-fox is a highly mobile species and the closest known active camp is approximately 3.6 km from the project area, the potential for impacts from noise on the species are considered reduced. <u>Artificial Light</u> Artificial light can affect both nocturnal and diurnal animals by disrupting behavioural patterns, with quality of light (e.g. wavelength, colour), intensity and duration potentially evoking different faunal responses. Impacts from increased light levels include disorientation from, or attraction toward, artificial sources of light; mortality from collisions with structures; and effects on light-sensitive cycles of species (e.g. breeding and migration for fauna and flowering in plants). An increase in artificial lighting can also affect abundance of predators. The presence and intensity of artificial light in the project area may temporarily increase during the construction phase; however, construction is anticipated to be restricted to daytime hours. Where needed, 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 the implementation of standard mitigation measures (discussed in **Section 5**), the project is likely to result in a negligible impact to any grey-headed flying-fox in the surrounding area due to the use of light pollution during construction. Additionally, light pollution during operation will also be mitigated through design and compliance with general standards in guidelines, particularly for light required within open space areas for safety. Lighting within open space areas is to face towards the urban development and away from conservation areas and vegetation within neighbouring allotments. The implementation of best practice lighting design will ensure that any long-term impacts on impact from development lighting infrastructure will be mitigated. <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:	<u>Noise</u> 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 which may include swift parrot and regent honeyeater in the event they are to occur within the surrounding retained vegetation areas. Additionally, noise levels are anticipated to increase once the development is complete as there will be increased vehicular and pedestrian traffic. Road noise will be the primary source of noise impact. However, as habitat will be consolidated within the vegetation retention areas and will be buffered by soft development uses such as street planting lasting impacts of noise on swift parrot and regent honeyeater resulting from the development are considered to be mitigated. <u>Artificial Light</u> Artificial light can affect both nocturnal and diurnal animals by disrupting behavioural patterns, with quality of light (e.g. wavelength, colour), intensity and duration potentially evoking different faunal responses. Impacts from increased light levels include disorientation from, or attraction toward, artificial sources of light; mortality from collisions with structures; and effects on light-sensitive cycles of species (e.g. breeding and migration for fauna and flowering in plants). An increase in artificial lighting can also affect abundance of predators. The presence and intensity of artificial light in the project area may temporarily increase during the construction phase; however, construction is anticipated to be restricted to daytime hours. Where needed, 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 the implementation of standard mitigation measures (discussed in **Section 5** and briefly below), the project is likely to result in a negligible impact on regent honeyeater and swift parrot in the surrounding area due to the use of light pollution during construction. Light pollution during operation will be mitigated through design and compliance with general standards in guidelines, particularly for light required within open space areas for safety. Lighting within open space areas is to face towards the urban development and away from conservation areas and vegetation within neighbouring allotments. The implementation of best practice lighting design will ensure that any long-term impacts on impact from development lighting infrastructure will be mitigated.

Indirect Impact	Koala	Grey-headed flying-fox	Swift Parrot and Regent Honeyeater
	• 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. High levels of airborne dust can irritate the respiratory systems of fauna and potentially result in ingestion of dust-coated seeds and other foods. Excessive deposition of dust on open water bodies may also degrade water quality and overall habitat quality for fauna. With the implementation of standard mitigation measures (discussed in **Section 5**), the project is likely to result in a temporary and minor impact to any koalas utilising the local area due to the generation of dust.	• 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. 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.	<u>Dust and Sediment Generation</u> Construction activities have the potential to generate dust emissions. Dust emissions during construction will be temporary. The main sources of dust will be generated via: • wheel-generated dust from the haul roads created for the construction phase; • dust lift-off from exposed surfaces (e.g. construction roads and pads); • earthworks, including construction of the embankments, and moving, dumping and shaping material; and • vegetation and soil clearing of the land. Excessive deposition of dust on leaves of plants can suppress the growth and photosynthesis, resulting in reduced habitat quality for fauna. High levels of airborne dust can irritate the respiratory systems of fauna and potentially result in ingestion of dust-coated seeds and other foods. Excessive deposition of dust on open water bodies may also degrade water quality and overall habitat quality for fauna. With the implementation of standard mitigation measures (discussed in **Section 5**), the project is likely to result in a temporary and minor impact to any swift parrot and regent honeyeaters 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 residential development.	Vehicles will be present during the construction phase and will include a mix of heavy and light vehicles. Temporary koala exclusion fencing will be installed post-clearing adjoining areas of vegetation to be retained (both on and off-site) and prior to construction commencing to prevent koalas from entering the construction site, reducing the potential for vehicle strike. Upon completion of the development, vehicle traffic in the area will increase compared to baseline conditions. A range of mitigation measures (discussed in detail in **Section 5**) including koala sensitive design will be implemented to reduce the likelihood of koala and vehicle interaction within the development. This will primarily be achieved through the installation of koala exclusion fencing along the edge of vegetation retention areas.	Grey-headed flying-foxes are not considered to be at increased risk of vehicular strike as they are not a ground-dwelling species.	Vehicle collision is a potential risk for the swift parrot and regent honeyeater. Swift parrot vehicle collisions are documented to be more frequent in the event where foraging resources are scarce, forcing foraging to occur in urban areas. While increased vehicle traffic is unavoidable as a result of the development, the development design avoids, where practical, roads traversing retained vegetation. This is considered to minimise the potential for vehicle collision with the threatened bird species.
c. Introduction to and /or proliferation of weeds and pathogens, in habitat for threatened species.	The creation of edge effects as a result of vegetation clearing and construction may result in an increase in the presence of weed species within and adjoining the project area. The potential for the spread of weeds will be managed through mitigation measures proposed in **Section 5.** Standard construction practices such as vehicle washdown may be implemented to limit the spread of pathogens in the adjoining environment. It is noted that there are no known pathogens that affect koala that are spread via vehicles or construction. Through the implementation of mitigation measures targeting weeds, the development is unlikely to result in an increase in weeds.	The creation of edge effects as a result of vegetation clearing and construction may result in an increase in the presence of weed species within and adjoining the project area. The potential for the spread of weeds will be managed through mitigation measures proposed in **Section 5**. Standard construction practices such as vehicle washdown may be implemented to limit the spread of pathogens in the adjoining environment. It is noted that there are no known pathogens that affect grey-headed flying-fox that are spread via vehicles or construction. Through the implementation of mitigation measures targeting weeds, the development is unlikely to result in an increase in weeds.	The creation of edge effects as a result of vegetation clearing and construction may result in an increase in the presence of weed species within and adjoining the project area. The potential for the spread of weeds will be managed through mitigation measures proposed in **Section 5.** Standard construction practices such as vehicle washdown may be implemented to limit the spread of pathogens in the adjoining environment. It is noted that there are no known pathogens that affect the swift parrot and regent honeyeater that are spread via vehicles or construction. Through the implementation of mitigation measures targeting weeds, the development is unlikely to result in an increase in weeds.

Indirect Impact	Koala	Grey-headed flying-fox	Swift Parrot and Regent Honeyeater
d. The increased risk of entanglement in wire fencing or other infrastructure within, and adjacent to, the site.	Industry standard fauna friendly site design measures will be implemented across the proposed development to reduce any physical risk posed by an increase in infrastructure in this area.	Industry standard fauna friendly site design measures will be implemented across the proposed development to reduce any physical risk posed by an increase in infrastructure in this area. Existing barbed-wire fencing on-site will be removed as part of the development. Electrocution on powerlines where they occur is a risk, however, entanglement in netting and on barbed-wire is considered highly unlikely and can be managed through the implementation of mitigation measures and procedures outlined within future management documents including the Vegetation Clearing and Fauna Management Plan (VCFMP) which will be prepared and subject to approval by Ipswich City Council.	Industry standard fauna friendly site design measures will be implemented across the proposed development to reduce any physical risk posed by an increase in infrastructure in this area.
e. Reduction in habitat connectivity to surrounding habitats, and any potential edge effects or disturbance to surrounding habitats, including any adjacent conservation areas.	<u>Habitat Connectivity</u> Habitat connectivity is present to the north, south and west of the subject site via retained corridors of vegetation associated with Opossum Creek. Connectivity to the east is already highly limited by existing residential development. In the broader landscape habitat values are fragmented by residential development and major roads including the Centenary Highway to the south. The increasing residential development within the locality means habitat suitable to koala has contracted to primarily sit within retained riparian areas. The proposed development while decreasing the available area of habitat will not reduce connectivity potential for koala and fauna generally within retained riparian corridors. <u>Edge Effects and Disturbance</u> The proposed action area and adjoining areas have been subject to modification due to historical land uses and clearing. As a result, existing edge effects and disturbance in the form of weed invasion are present within gully lines, creeks and isolated areas over the balance of the site. These areas, where to be retained, will be rehabilitated post-construction.	<u>Habitat Connectivity</u> The proposed development is not expected to reduce connectivity of suitable habitat for the grey-headed flying-fox due to the highly mobile nature of the species and abundance of suitable habitat in the surrounding landscape. <u>Edge Effects and Disturbance</u> The proposed development is not anticipated to result in edge effects or disturbance to retained grey-headed flying-foxes habitat. Retained vegetation areas will be rehabilitated to remove weeds and plant with native species where required. Edge effects are unlikely to impact the suitability of retained vegetation for foraging purposes given their ability to utilise highly fragmented areas for incidental foraging. Notably, there are no grey-headed flying-fox roosts located within or adjoining the project area.	<u>Habitat Connectivity</u> Habitat connectivity is present to the north, south and west of the subject site via retained corridors of vegetation associated with Opossum Creek. Connectivity to the east is already highly limited by existing residential development. In the broader landscape habitat values are fragmented by residential development and major roads including the Centenary Highway to the south. The increasing residential development within the locality means habitat potentially suitable for the swift parrot and regent honeyeater has contracted to primarily sit within retained riparian areas. While the proposed development will decrease the available area of habitat it will not reduce connectivity potential for swift parrot and regent honeyeater via retained riparian corridors. <u>Edge Effects and Disturbance</u> The proposed action area and adjoining areas have been subject to modification due to historical land uses and clearing. As a result, existing edge effects and disturbance in the form of weed invasion are present within gully lines, creeks and isolated areas over the balance of the site and adjoining areas. These areas, where to be retained, will be rehabilitated post-construction.
f. Changes to hydrology and water quality within, and around, the site, including increased siltation.	Ephemeral drainage lines are present within and adjoining the site. Opossum Creek (stream order 4 watercourse) is situated south-west of the project area. The upstream portion of a tributary of O'Dwyer's Gully is mapped in the northern extent of the project area. Earthworks and construction disturbances are not proposed to occur within these waterways. Where earthworks are to occur proximal to waterways, the implementation of standard mitigation measures (discussed in **Section 5**) will reduce the potential for development to impact these areas. Standard mitigation measures include but are not limited to waterway setbacks and maintenance of creekline vegetation, implementation of site-based erosion and sediment control plan which will be prepared at operational works, and the location of stormwater detention technologies at various locations across the site to minimise the effects of excess rainwater flowing into catchments caused by the creation of hardstand areas. A Stormwater Management Plan (SMP) will be prepared for the project as part of the ADP approval process. The SMP will provides a strategy to manage stormwater runoff within the development areas using a series of bioretention systems. During clearing and construction, all work is to be undertaken in accordance with appropriate management plans including but not limited to, a Construction Environmental Management Plan (CEMP) and Erosion and Sediment Control Plan	Ephemeral drainage lines are present within and adjoining the site. Opossum Creek (stream order 4 watercourse) is situated south-west of the project area. The upstream portion of a tributary of O'Dwyer's Gully is mapped in the northern extent of the project area. Earthworks and construction disturbances are not proposed to occur within these waterways. Where earthworks are to occur proximal to waterways, the implementation of standard mitigation measures (discussed in **Section 5**) will reduce the potential for development to impact these areas. Standard mitigation measures include but are not limited to waterway setbacks and maintenance of creekline vegetation, implementation of site-based erosion and sediment control plan which will be prepared at operational works, and the location of stormwater detention technologies at various locations across the site to minimise the effects of excess rainwater flowing into catchments caused by the creation of hardstand areas. A Stormwater Management Plan (SMP) will be prepared for the project as part of the ADP approval process. The SMP will provides a strategy to manage stormwater runoff within the development areas using a series of bioretention systems. During clearing and construction, all work is to be undertaken in accordance with appropriate management plans including but not limited to, a Construction Environmental Management Plan (CEMP) and Erosion and Sediment Control Plan	Ephemeral drainage lines are present within and adjoining the site. Opossum Creek (stream order 4 watercourse) is situated south-west of the project area. The upstream portion of a tributary of O'Dwyer's Gully is mapped in the northern extent of the project area. Earthworks and construction disturbances are not proposed to occur within these waterways. Where earthworks are to occur proximal to waterways, the implementation of standard mitigation measures (discussed in **Section 5**) will reduce the potential for development to impact these areas. Standard mitigation measures include but are not limited to waterway setbacks and maintenance of creekline vegetation, implementation of site-based erosion and sediment control plan which will be prepared at operational works, and the location of stormwater detention technologies at various locations across the site to minimise the effects of excess rainwater flowing into catchments caused by the creation of hardstand areas. A Stormwater Management Plan (SMP) will be prepared for the project as part of the ADP approval process. The SMP will provides a strategy to manage stormwater runoff within the development areas using a series of bioretention systems.

Indirect Impact	Koala	Grey-headed flying-fox	Swift Parrot and Regent Honeyeater
	(ESCP) to ensure the hydrological changes across the proposed action area do not impact on surrounding vegetation and waterways. The ESCP and CEMP will be prepared in consultation with the site contractor to suit the staging and construction requirements of the site. With the above mitigation measures, potential indirect impacts resulting from modified hydrological regime are unlikely to impact on surrounding koala habitat.	(ESCP) to ensure the hydrological changes across the proposed action area do not impact on surrounding vegetation and waterways. The ESCP and CEMP will be prepared in consultation with the site contractor to suit the staging and construction requirements of the site. With the above mitigation measures, potential indirect impacts resulting from modified hydrological regime are unlikely to impact on surrounding grey-headed flying-fox habitat.	During clearing and construction, all work is to be undertaken in accordance with appropriate management plans including but not limited to, a Construction Environmental Management Plan (CEMP) and Erosion and Sediment Control Plan (ESCP) to ensure the hydrological changes across the proposed action area do not impact on surrounding vegetation and waterways. The ESCP and CEMP will be prepared in consultation with the site contractor to suit the staging and construction requirements of the site. With the above mitigation measures, potential indirect impacts resulting from modified hydrological regime are unlikely to impact on surrounding potential swift parrot and regent honeyeater foraging habitat.

5. Avoidance and Mitigation

This section responds to Item 5 of the PD request which requests the provision of a consolidated description of all proposed measures to avoid and mitigate impacts, including any additional to those described in the referral. The following subsections provide a response to Item 5.

The following comments are made in relation to the avoid and minimise provisions, noting the *Nature Positive Plan* (December 2022) is considered retrospectively to both the project and information formally requested by the Department on two occasions.

5.1 Description of impact avoidance mitigation measures

Item 5.1(a) of the PD Request asks for ***"Discussion of consideration and assessment of alternative strategies, plans and measures to avoid and mitigate impacts (e.g. alternative project plans, retention of habitat/movement corridors/buffers, and fauna-friendly development and road design)."***.

EPBC 2020/8629 seeking approval for the Peninsula Precinct in the City of Greater Springfield was originally lodged to the Department in March 2020 and continues to work through increasing and inconsistent Department views on matters and impacts. The Peninsula Precinct seeks approval to undertake development in accordance with the longstanding SSP approved in 1997 and the founding document for which all other EPBC approvals in the local area have been approved against.

Further information has been provided to the Department on multiple occasions, with revised iterations of this Preliminary Documentation provided in December 2022, January 2023 and March 2024 following the submission of Version 1 in October 2021. Fragmented feedback has been received from the Department from 2022 to 2025, and an on-site inspection was held at the Peninsula Precinct with 3 Department staff on the 18 May 2023. Like a number or projects spanning this timeframe delays have been primarily caused by the changed view of species impacted based on upgraded 'Conservation Advice.' Significant additional survey has been completed in response to additional Department requests. It is acknowledged the Department has re-structured and now seeks proponent's place and increased emphasis on 'avoiding and minimising' impacts in accordance with the *Nature Positive Plan – December 2022*, however, there requires some level of recognition of the pre-dating decisions and applications for this project.

It is noted that the City of Springfield has a long and established history of approvals and construction. The SSP, approved in 1997, pre-dates the EPBC Act by 2 years and its only as a result of the land partnership model, which has enabled the city area to develop flexible and under multiple fronts that, parts of the project have been belatedly triggered into the EPBC Act process. Refer to **Figure A9** for location of the referral area within the SSP. The specific Town Centre Concept Plan, which includes the Peninsula Precinct, was approved in 2002 and through this land use plan the dedication of 392 ha of land earmarked for development within the South East Queensland being delivered as Conservation. Over the broader Springfield land holdings, the committed conservation land was assessed via an Environmental Impact Study, completed in accordance with the legislation of the day, to retain the highest value areas. These conservation areas were committed because of existing values and geographical location which enabled

connection to an inter government bioregional biodiversity corridor (Flinders – Greenbank – Karawatha Bioregional Corridor). To enable this volume of "Urban Footprint" land to be committed instead to conservation outcomes, significant housing density and investment in infrastructure was required around the town centre area of the City of Springfield (refer **Figure A10**).

The Peninsula Precinct is part of the Town Centre zoning and 2002 Town Centre approved concept plan. This project will be a high-density residential development area which will establish as a series of neighborhoods, each reflecting a distinct character in response to the fringing city local context and amenity of the surrounding environment. Over 5000 dwellings are approved to be located in this precinct at a density exceeding 200 dwellings per hectare, with building heights ranging from 5 – 20 stories. The residential community will be positioned adjacent to the existing Brookwater Golf Course and will connect vehicle access to the south where roads are already present including highly traversed Brookwater Drive. This precinct forms part of the core of the Springfield City Centre which is identified as a principal activity center in the Queensland Government's SEQ Regional Plan. Key infrastructure investments that have occurred that supports this high-density residential precinct including the Springfield Central railway station, Brisbane Lions Brighton Homes Arena, which is a nominated 2032 Olympic venue, and the Orion Springfield Central shopping precinct – all within short walking distance of precinct.

Based on the densities currently required to be achieved in a Priority Development Area, in order to accommodate this density of development in a more traditional greenfield subdivision pattern it would require a significantly greater infrastructure investment and utilise in excess of 350 ha of land. This site is 18.9 ha.

The specific land use rights and context of the Peninsula Precinct cannot be replicated anywhere in Queensland as the land is:

1. Zoned and approved for higher density development; State and Local Government Planning documents direct higher density development at this location to help with South East Queensland housing supply challenges.
2. The City of Greater Springfield has over 29 years where it has continually constructed all aspects of the city from residential, to employment, health and education. The establishment of these uses provide the critical mass for higher density to be desired at this location. This density of development will not occur in other Priority Development Areas for decades as the amenity is not established for the product type to be supported by customers.
3. Provision of residences within walking distance to the town centre, train station, schools, shops and health facilities – No other location in South East Queensland can provide this outcome.
4. Occurs on a major collector road which is part of the city's primary bus route.
5. Includes adjacent and underground infrastructure for water, sewer, power. All recent upgrades by utility providers cater for the large volume of new residents occurring in this location, with these same providers relying on this rate base for return on costs invested.

The allotment on which the Peninsula Precinct is located is consistently vegetated like much of Greater Springfield. At the time of purchase the broader land holding was actively run as an operational native timber harvesting, which has resulted in a few large old growth trees remaining. The land achieves the

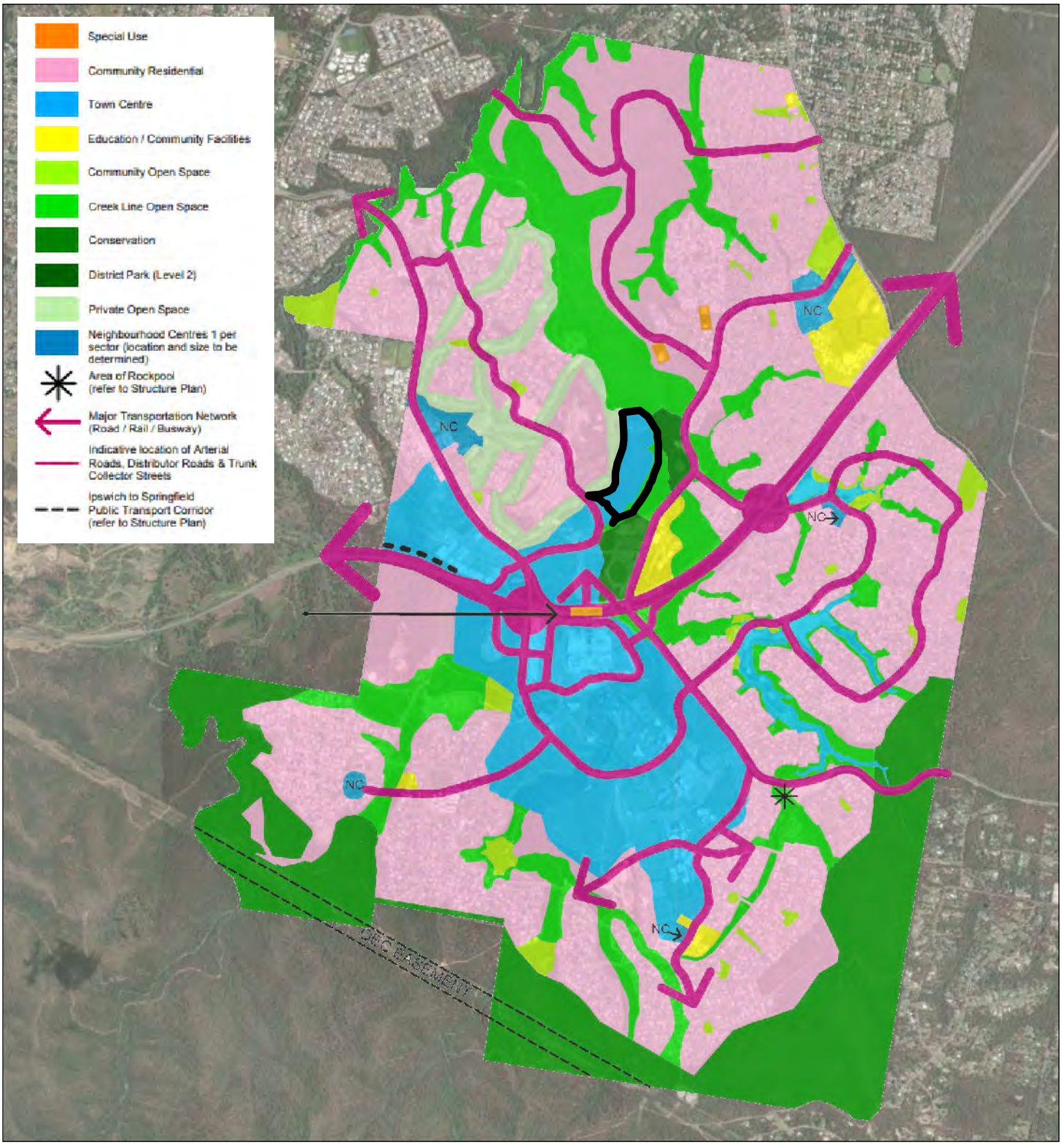
definition of remnant vegetation under the Queensland VMA, however, this is a deliberately low definition designed to capture and assess vegetation clearing rather than reflect old growth mature bushland. The former timber harvesting use is evident by the moderate sized patch of *Eucalyptus grandis*, a native tree that is not endemic to the area, planted in timber rows adjacent to the eastern and northern boundaries of the precinct.

Land access is via Brookwater Drive, which is a collector scale road and sits between the Brookwater Golf Course to the west and the Springfield Greenbank Arterial Road to the east. Directly east is the Hymba Yumba Independent School. The school facilities and sports fields are 80m from the Precinct boundary separated only by the plantation timber rows of the former forestry operation. To the north is the Opossum Creek environmental corridor. This creek occurs in a 100 m wide retained vegetation area on land dedicated by the Springfield City Group as part of the broader environmental network for the city. The context of the Peninsula Precinct area results in the site being exposed to constant urban and construction noise sources from major roads, the surrounding schools and a combination of government-based projects and private area developments. The Springfield Greenbank Arterial was being widened in the direction of the site during site surveys.

Given the volume of density required for the project to be functional and relatively small and linear land holding site, design provides no meaningful additional avoidance opportunities for MNES habitat. The design is considerate in terms of all vehicular access being provided from the south in connection with existing roads and does not propose roads north, east or west over the creek corridors or the golf course. Therefore, safe fauna movement is provided, and fragmentation avoided to the greatest extent possible. The land holding is centrally located in the town centre and is not strategically linked to any environmental connectivity to south, east or north. The higher density unit living proposed at the site will remove impacts associated with private property adjoining the creek corridor, bringing lower levels of dog ownership and greater control over domestic animal management.

The project covers a small footprint in the scheme of the dwellings and housing outcomes provided, however results in very little relevant or meaningful opportunity for further avoiding impacts on MNES habitat beyond those already provided in the broader Springfield Structure Plan. An environmental offset is proposed for impacts incurred and located at a large-scale site with an aggregate of other offset approvals and proposals. Small impacts often result in small, fragmented offsets of limited function and conservation value and Springfield City Group are avoiding this by seeking to aggregate their offset requirement with a provider with a larger land holding and multiple offset outcomes. Refer **Attachment A9** for the Rosevale Offset Management Plan (ROA 3).

A number of specific avoidance and mitigation measures are proposed to reduce identified impacts on the Koala, Grey-headed Flying-fox, Regent Honeyeater and Swift Parrot and their habitat which are outlined in the sub-sections below.



Legend

Referral Area

Figure A9

Springfield Structure Plan

Springfield City Group Pty Ltd

File ref. 7399 E Figure A9 SSP F
Date *18/08/2026*
Project *Peninsula Precinct*

0 500 1,000 1,500 *m*

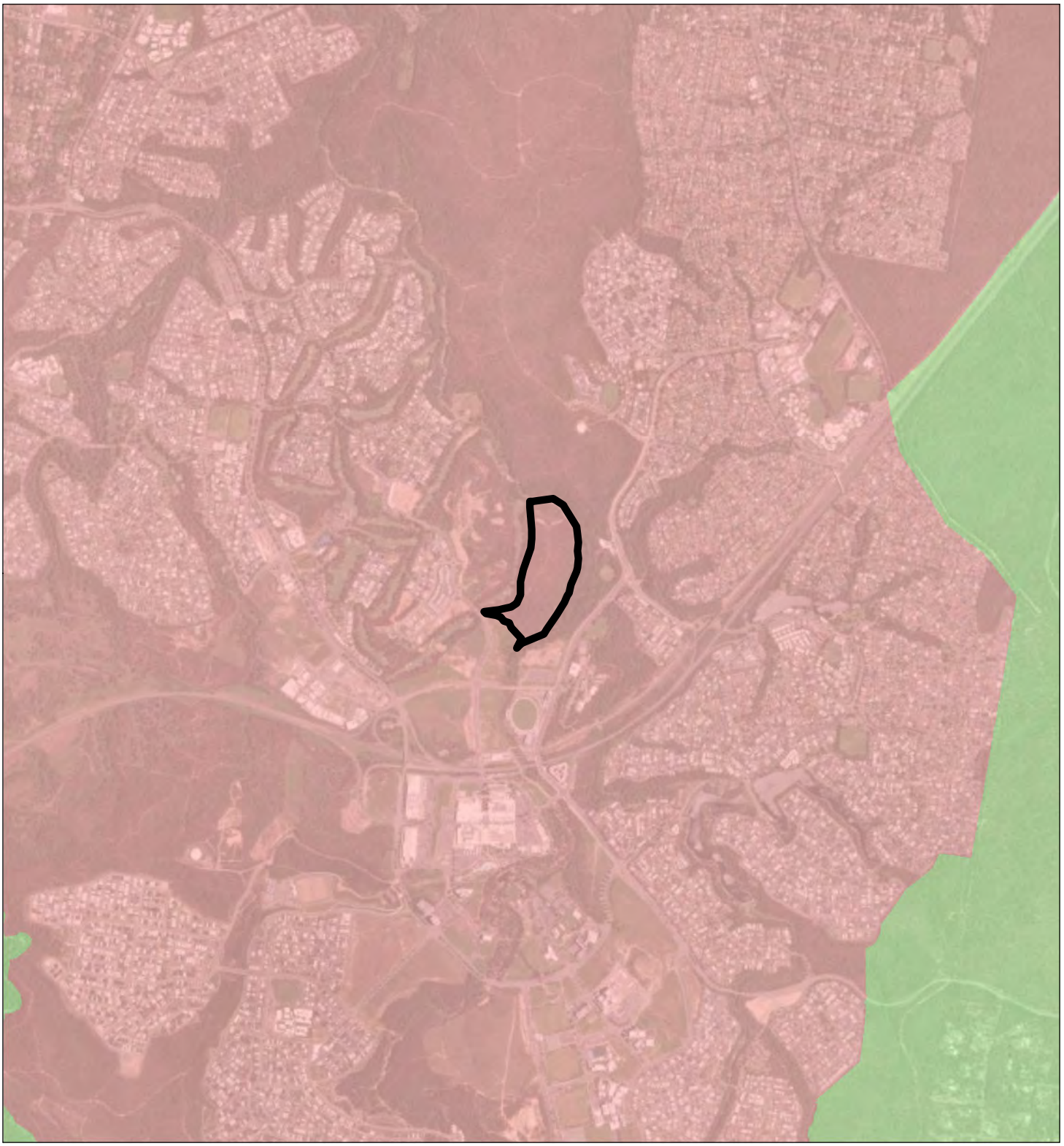
Scale (A4): 1:40,000 [GDA 1994 MGA Z56]

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Layer Source: *© State of Queensland 2021*



Legend

Referral Area

Regional Land Use Categories

Urban Footprint

Rural Living Area

Regional Landscape and Rural Production Area

Figure A10

South East Queensland Regional Plan

Springfield City Group Pty Ltd

File ref. 7399 E Figure A10 SEQ RP F
Date *18/08/2026*
Project *Peninsula Precinct*

0 200 400 600 800 1,000 *m*

Scale (A4): 1:30,000 [GDA 1994 MGA Z56]

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5.1.1 Management Plans

The following management plans will be drafted and scheduled as part of mandatory Council and State Government approval items to be developed as part of operational works applications. Refer to the relevant sections for further details.

- Erosion and Sediment Control Plan (to be drafted in consultation with the engaged site contractor – to be advised).
- Construction and Environmental Management Plan (to be drafted in consultation with the engaged site contractor – to be advised).
- Stormwater Management Plan (to be drafted in consultation with the engaged site contractor – to be advised).
- Site-based Management Plan (refer **Section 5.2.1**).
- Vegetation Clearing and Fauna Management Plan (refer **Section 5.2.3**).
- Rehabilitation Management Plan (refer **Section 5.4.1**).
- Nest Box Management Plan (refer **Section 5.4.2**).

5.2 Description of pre-clearance and clearance procedures

Item 5.1(b) of the PD Request asks for ***"Details about pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease."*** A range of mitigation measures are proposed to reduce identified potential direct and indirect impacts on habitat suitable for the identified MNES during the clearing and construction phases of the project. The mitigation measures are summarised below:

- Implementation of a Site Based Management Plan to form a guide for management measures required to be implemented over the course of the project.
- Preparation of a Vegetation Clearing and Fauna Management Plan (VCFMP) for specific clearing phase.
- Pre-clearance measures including installation of fauna friendly tree protection fencing around vegetation clearing areas.
- Engagement of a Department of Environment, Science, Tourism and Innovation (DETSI) registered fauna spotter catcher and AQF Level 5 Arborist to supervise clearing activities.
- Preparation of Environmental Pre-clearance Prestart Procedure.
    - Preparation of Environmental Pre-clearance Packages.
    - On-site environmental pre-start meeting
- Installation of temporary Koala exclusion fencing around construction areas prior to construction commencing.
- Preparation of a Construction Environmental Management Plan and Erosion and Sediment Control Plan in consultation with the civil contractor.

These management measures are described in further detail in the below sub-sections. The implementation of management measures is proposed to be documented in annual compliance reporting to be conditioned for the project.

5.2.1 Site Based Management Plan (Environment)

In addition to mitigation outcomes incorporated in the design process, a number of management measures are proposed to ensure impacts are avoided and or minimised through the construction and operational phases.

To avoid and mitigate the direct and indirect impact from the project on the Koala, Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater (MNES) a project specific Site Based Management Plan (Environment) (SBMP) will be prepared. The SBMP will act as the overarching Environmental Management Plan for the project.

Key outcomes within the SBMP for Koala, Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater include:

- MNES are protected on-site.
- The abilities for MNES to move into, within and out of the site is maintained.
- Potential risks to MNES (e.g. vehicle strike, entanglement, fragmentation of habitat / becoming stranded, noise/light pollution etc.) are identified and appropriately managed.
- All persons involved in construction and operation of the development are aware of the site values, their potential to impact on MNES and their habitat, and their responsibilities in regard to procedures and strategies with the SBMP.

The SBMP will outline construction measures to manage and mitigate impacts on native flora, and fauna, specifically the Koala, Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater and will include details on:

- Project Description, site design and identification of conservation areas
- Ecological Values of the Project Area, including:
    - Existing flora and fauna values on the subject site and in surrounding areas; and
    - Key results from survey data, including MNES occurrence and the availability and quality of habitat.
- Environmental Management, including:
    - SBMP objectives;
    - Identification of key personnel;
    - Roles and Responsibilities;
    - Environmental awareness and compliance training for all contractors and sub-contractors;

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

    - Reporting and monitoring.
- Education and Awareness, including distribution of Lifestyle Guidelines

5.2.2 Vegetation Clearing and Fauna Management Plan

An overarching Vegetation Clearing and Fauna Management Plan (VCFMP) will be 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. Further, separate fauna management measures will be implemented post-development to mitigate potential ongoing impacts to fauna, with specific measures to manage MNES. The VCFMP and fauna management protocols will be overseen by ICC and are required under State legislation. These documents will underpin operational works approvals sought by ICC.

The following detailed information will be included in the VCFMP:

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

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

- Immediately prior to the commencement of clearing of native vegetation, a daily visual inspection of the area must be carried out;
- In the event of an animal being located, an area of 5 metres radius should be established around the tree, excluding machinery from this area until the animal has relocated (usually overnight); or

- If an animal requires relocating, this must be undertaken by a suitable qualified fauna expert (e.g. fauna spotter-catcher) recognised by the Queensland Parks and Wildlife Service.
- Any native fauna orphaned or injured by the development process must be reported to the Queensland Parks and Wildlife Service.
- The site supervisor is responsible for the safe management of site fauna and implementation of these specific fauna requirements.

Fauna management information will include:

- Species surveyed as using the site with a focus on those most likely impacted by development works.
- A list of relevant State and Commonwealth legislation constraints and controls for the above listed fauna.
- A plan showing existing habitat opportunities and locations.
- Details of the threats to existing fauna species.
- Clearing sequence plan from the VCFMP.
- Management and mitigation measures *i.e.,* temporary use of fauna exclusion fencing.
- Fauna spotter role, contacts and certification.
- Specific fauna management procedures for potential or known habitat trees.

5.2.3 Environmental Pre-Clearance Package

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

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

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 and the Environmental Pre-clearance Package.

All relevant parties (e.g. civil contractor, clearing contractor, fauna spotter, environmental coordinator, superintendent and client) must sign the checklist prior to clearing, acknowledging that they have reviewed all, and will undertake the works in accordance with, approved procedures and reporting.

As way of acknowledgement, the Environmental Pre-Clearance Checklist will be run through at a project pre-start meeting with all personnel and relevant parties required to sign the checklist. No clearing can commence for a specific phase of works until the checklist has been completed and signed off by the Environmental Coordinator.

5.2.4 Fauna Spotter Catcher Roles and Reporting

As required by the SBMP, a DETSI registered Fauna Spotter Catcher must be appointed to ensure fauna management, specifically Koala and Grey-headed Flying-fox management, prior to, during and post clearing. This role is mandated for any clearing of native vegetation in Queensland. The role of the Fauna Spotter Catcher is to complete an assessment of the works area no more than 2 weeks prior to clearing and present a short report to the proponent on the findings and how the proposed clearing is to be managed. The Fauna Spotter Catcher is required at the pre-start meeting and be 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 any Grey-headed Flying-foxes identified on-site in accordance with the protocols discussed in the SBMP;
- 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
    - Ensure old (>12 hours) piles of felled vegetation are treated as potential wildlife habitat and inspected by a wildlife spotter/catcher prior to removal or destruction
- Limiting the felling of habitat and hollow bearing trees to the following methods:
    - Segmental removal of tree, with hollow bearing limbs being checked by the Fauna Spotter Catcher and cleared of fauna using a cherry picker or suitable means determined by the Fauna Spotter Catcher
    - Segmental removal of the tree, with hollow bearing limbs plugged and lowered to the ground for inspection by wildlife spotter
    - Use of an excavator with vertical grab to lower the main trunk (only after the removal of lateral limbs) and
    - A combination of the above methods.

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

The project will adopt 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 DETSI.

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

The WPMP should include the following information:

- Description of the project with reference to impacts on wildlife or wildlife habitat;
- Pre-development plan of the site showing habitat areas, features, corridors, riparian habitats and adjacent areas;
- Results of any fauna surveys including pre-clearance surveys; and
- A wildlife and habitat impact assessment based on the proposed development works.

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

Following completion and of the WPMP the Fauna Spotter Catcher should prepare a more specific 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 should form part of the Wildlife Management Report to be issued under licence requirements to the State Government. The Wildlife Management Report should consist of the following 3 sections:

1. Wildlife Habitat Management Plan – Aspects of the planning, design, construction and ongoing operation of the project in which risks to wildlife have been identified. This plan should also include recommendations and outline the type, frequency and timeframes for monitoring

2. Wildlife Capture and Disposal Plan – Should contain the following details for each captured 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)
   o. For released animals, location relative to point of capture

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

5.3 Description of buffers or proposed exclusion zones

Item 5.1(c) of the PD Request asks for ***"a description (including maps and imagery) of the location, boundaries and size of the buffer areas or proposed exclusion zones, and details on how these areas will be enhanced, protected and maintained. Also include here a description of any fences or barriers which may be installed around areas where impacts will be avoided."***

The proposed action will be contained within the referral area which is the development area nominated on **Plan A1**. The off-site open space provides a setback to the adjacent Opossum Creek. No works are proposed beyond the development area. Fencing between the off-site habitat and the development area is not proposed, and the combination of new uses and landscaping design omitting primary or secondary Koala food trees 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 area within Opossum Creek shown on **Plan A1** does not form part of this project and is therefore an exclusion area.

5.3.1 Fauna friendly tree protection fencing

Clearing and construction works associated with the development impacts will be limited to a maximum of 18.9 ha. Prior to clearing, temporary fauna friendly tree protection fencing and in the form of orange bunting and temporary signage will be installed around each staged clearing impact area (refer **Photo set 6** for example). The presence of tree protection fencing will ensure that no authorised clearing impacts occur outside of the clearing footprint and to allow any fauna present within the clearing footprint to disperse retained habitat areas.





Photo set 6: Fauna friendly tree protection fencing and signage to be installed around tree protection zone during clearing.

5.3.2 Temporary fauna exclusion fencing

Following the completion of vegetation clearing for the relevant phase and prior to construction commencing, temporary Koala exclusion fencing will be installed around the perimeter of the works footprint to prevent fauna from entering the construction footprint. Temporary koala exclusion fencing may different design include chainwire floppy-top fencing or construction fencing fitted with a panel of unclimbable material with the top of the sheeting 1.5 m from the ground as per the *Koala Sensitive Design Guideline* (DES, 2022) and *Fauna Sensitive Transport Infrastructure Delivery manual* (DTMR, 2024). Refer to **Table A48** for temporary fauna exclusion fencing options that may be utilised at the completion of clearing and to enable the construction of permanent fencing where proposed.

Table A48: Temporary exclusion fencing options

Type	Specifications	Image
Chain wire and picket fence with floppy top	• Chain wire • Star pickets • install star pickets on construction area side of fence	
Chain wire panel fencing with exclusion elements	• Chain wire panels • Plastic footings • 600 mm sheet metal/Perspex top	Source: DTMR (2024) *Figure 5.3.3(c) – Plant-hire fencing with panel at top to inhibit climbing by koala* 

5.4 Details on rehabilitation measures

Item 5.1(d) of the PD Request asks for *"**details of any rehabilitation measures to be implemented for disturbed areas, including rehabilitation objectives, target species, timing of rehabilitation stages, methodology, maintenance measures, schedules and monitoring.**"*

Rehabilitation of open space (*i.e.,* creation of an open space park) within the development area will be carried out with the aim of supporting *in situ* habitat and ecological values and reconstructing values where land will be cleared in support of change to ground level engineering requirements. The off-site natural area will serve as a buffer between the development and the adjoining Opossum Creek Corridor to the west.

5.4.1 Rehabilitation Management Plan

A Rehabilitation Management Plan will form part of the broader management document submitted as part of the operational works drawings to council for the project site. The RMP will include, and is not limited to:

- Rehabilitation details of species' specific habitat;
- Details of proposed rehabilitation works including proposed species and planting palette;
- Planting modules to demonstrate planting densities;
- All weeding works required, including a full list of known weeds on-site and how each weed can adequately be managed
- The required ongoing management / maintenance regimes, including:
    - Plans indicating maintenance areas / zones;
    - Schedules of works including frequency and tasks;
    - Allocation of labour and resources to perform tasks;
    - Nomination of key performance indications / criteria for monitoring purposes (e.g. all revegetation areas, minimum 90% weed free etc.);
    - Time allocated to performance various tasks (e.g. top up mulch, pruning, topdressing etc);
    - Defects liability for materials such as replacement of dead plant species of equivalent species and vigour;
    - Coordination of services such as irrigation repair or civil infrastructure maintenance (such as stormwater) that may impact on the landscape establishment and maintenance periods;
    - Management of bushfire hazard (where approved);
    - Management of domestic farm / feral animals (if appropriate);
    - Management of public access and / or restricted access areas;
    - Tree management procedures;
    - Management and maintenance of regimes for sediment and erosion control devices, and irrigation;
    - Proposed future need for infrastructure, including public facilities; and
    - Management and control of declared plants and recognised environmental weeds.

The Rehabilitation Plan will be subject to approval and prepared in accordance with the South East Queensland Ecological Restoration Framework (SEQERF).

This will be subject to on-maintenance and off-maintenance requirements with ICC. Once off-maintenance and ownership of the reconfigured land has been transferred to third parties (e.g. council, private individual, other property owners), this will signal the completion of the action and ongoing mitigation and management measures relating to species management across the project area will reach an end point.

5.4.2 Nest Box Management Plan

A Nest Box Management Plan is proposed to be prepared as part of the overall documentation anticipated to be required for the local approval process to compensate for the removal of hollow-bearing trees within the referral area as required by ICC. Nest boxes are proposed to be installed within the adjoining retention area of Opossum Creek per ICC specifications. The Nest Box Management Plan will generally include:

- Compile Nest Box Strategy in accordance with the Environmental Areas and Corridors Planning Scheme Policy and Conditions Package, including:
- Exact number of habitat trees and number of hollows to be impacted,

- Assessment of replacement hollows required as per 'No Net Loss of Fauna Habitat' condition requirements,
- Assessment of target species,
- Requirements for the target species,
- Nest box types - design and sizes,
- Installation technique,
- Scaled plan showing the proposed location of installed nest box including GPS location and tree details
- Installation timeframes which provide for installation prior to the commencement of clearing wherever possible, otherwise within seven (7) days of clearing; and
- Monitoring and maintenance regime details, including protocols for replacing fallen or broken nest boxes (Nest boxes must be monitored and maintained for a minimum of 12 months post installation)
- Detail location and particulars of Council triggered 'Habitat Trees'

5.5 Details of the proposed ongoing management activity

Item 5.1(e) of the PD Request asks for ***"details of any ongoing mitigation and management measures during the operation of the facility."***

A range of mitigation measures are proposed to be implemented as part of the operational phase of the project including:

- Implementation of fauna friendly road and lighting design and Koala awareness signage along vegetation interface areas.
- Rehabilitation of vegetation retention areas in accordance with an approved Rehabilitation Management Plan to be approved as part of operational works with on-maintenance and off-maintenance requirements (discussed in **Section 5.4.1**).
- Fauna movement infrastructure installed where roads intersect retained habitat areas (if applicable).
- Landscape species selection to include non-foraging tree species to discourage koalas and other native fauna from entering the development area.

The following sub-sections detail the ongoing mitigation and management measures during the operation of the development.

5.5.1 Fauna Friendly Road Design and Crossings

At the detailed design stage, tweaking of road locations, setbacks and earthworks will occur to ensure the environmental values are protected and enhanced. Should fauna crossings be identified as necessary proximal to the retained open space areas, design specifications for the 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 open space area will include fauna friendly crossings designed in accordance with the *Fauna Sensitive Transport Infrastructure Delivery* manual prepared by the Queensland Department of Transport and Main Roads (DTMR, 2024) and the Queensland *Koala Sensitive Design Guidelines* (DES, 2022), or equivalent (refer **Insert 2**). 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 via the use of retained canopy cover, rope bridges, glider poles, Koala poles etc.;
- 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 slow traffic areas and/ or safe fauna crossing areas, including but not limited to, appropriate fauna signage, maximum 50km/hr, speed humps 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. 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. 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 may include:

- Roads slowed to 50 km per hour
- Road thresholds changed 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



Figure 4.3.1. (photo D de Villiers) Winding local roads with slow points helps to reduce vehicle speed and avoid collisions with koalas.



Figure 4.3.2. (photo D de Villiers) Koala crossing zone has a reduced speed limit to slow vehicles and allow the detection of koalas crossing the road between habitat patches.



Figure 4.3.12. (photo D de Villiers) A 3.0 m x 3.0 m box culvert provides maximum light penetration and is large enough for fauna furniture to aid movmement and predator avoidance.



Figure 4.3.13.(photo D de Villiers) Koala exclusion fencing constructed along a rail line. Without barrier fencing, koalas will likely walk across the rail line and avoid the dedicated fauna crossing point/culvert. Fencing completed below.

Insert 2: Examples of Koala-safe transport infrastructure from *Koala Sensitive Design Guideline (2022)* including slow points (left) and fauna furniture (right).

5.5.2 Fauna awareness signage

Where the proposed development includes esplanade roads running adjacent vegetation retention areas, the design will adopt traffic calming and reduced speed signage to control vehicles adjoining sensitive areas.

A combination of Koala awareness signage and reduced speed signage will be installed along esplanade roads located adjacent to the vegetation retention areas. The project will adopt the *Fauna Sensitive Transport Infrastructure Delivery* manual (Chapters 7 and 13) and *Draft Technical Note Wildlife Signage Guidelines* developed by DTMR to ensure best practice fauna management is incorporated into the design of wildlife movement solutions (where considered appropriate) or slow down points). The posted vehicle speed limit will be subject to ICC approval; however, it will not exceed 50 km/h and may be reduced at road crossing areas.

5.5.3 Landscaping

A non-Koala tree landscape mix to be used in estate landscaping. Ensure street and park trees while being planted out with non-invasive native trees do not specifically include any primary or secondary Koala food trees. The goal of this approach is to minimise the attraction for Koalas to enter the development area.

The adjacent open space area (outside the project area) will retain Koala habitat trees thus also providing foraging sources for GHFF, Regent Honeyeater and Swift Parrot.

5.5.4 Lighting

Fauna sensitive lighting design will be utilised along esplanade roads adjoining the vegetation retention areas and natural areas associated with Opossum Creek. This includes installing shielded light fittings to minimise light spill into the natural areas and use of appropriate luminaire type identified as suitable for terrestrial mammal habitat under the Commonwealth *National Light Pollution Guidelines for Wildlife* (DCCEEW, 2023). Fauna sensitive lighting will be installed in accordance with recommendations under the Guideline and in accordance with industry standards *i.e., AS/NZS 1158 Set: 2010: Lighting for roads and public spaces* and *AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting*.

5.5.5 Dog control measures

Restrictions will manage pets throughout the development, through fences around dwellings and mandates on leash when in common areas. No off-leash dog areas are included as part of the proposed action. Dog controls will be enforced and maintained by Council under local regulations.

The proposed vegetation retention area adjoining the referral area will be handed over to Council on completion as per standard practice and Council approval. These areas will become part of their ongoing open space and reserve management areas administered by the dedicated parks management team.

5.5.6 Education and Awareness

<u>Lifestyle Guidelines</u>

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

- Appropriate plant selection on allotments
- Inappropriate planting species (known local or declared weed species)
- Management of house hold scale run off
- Protection of native animals and the types of native animals residents could expect to see
- Understanding storm water devices
- Appropriate management of domestic animals
- Key local and state phone numbers to contact if distressed or orphaned fauna is located.

A copy of the lifestyle guidelines will be issued to new residents upon the purchase of an allotment within the development.

5.6 Further details of measures proposed

Item 5.2 of the PD Request asks ***"For each measure proposed, indicate the:***

a) Responsible party

b) Environmental outcomes to be achieved

c) Milestones / performance / completion criteria

d) Proposed monitoring and evaluation program."

Refer to **Sections 5.2 to 5.5** for further details.

Item 5.3 of the PD Request asks for ***"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 ability of the measure to reduce the risk of a threat. 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."***

An assessment of mitigation measures effectiveness is provided in **Table A47** for Clearing and Construction Impacts and **Table A48** for Operational Impacts.

5.6.1 Clearing and construction impacts

Table A49: Clearing and Construction Impacts

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure item	Timeline for delivery	Risk Assessment	Milestone	Responsible Party	Monitoring Program	Environmental Outcome
Loss of a maximum of 18.9 ha of critical habitat for the koala and grey-headed flying -fox, 3,339 habitat features for the swift parrot and 2,756 habitat features for the regent honeyeater	Habitat to be cleared on site is regrowth and remnant vegetation that has been subjected to historical modification. Regional Ecosystems are proposed to be retained within open space where vegetated buffers between the development and riparian corridor are to be retained, minimising potential impacts to ecosystem function. No more than 18.9 hectares of vegetation will be removed to facilitate the development.	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 not more than 18.9 hectares of vegetation containing critical habitat for the koala, grey-headed flying-fox, swift parrot and regent honeyeater.	Avoiding high value areas at development design	Works complete	The field survey applied has accurately mapped the features that are to be avoided and retained within the vegetation retention area.	The ecological retention area is intact at completion of works, with mitigating factors outlined below effectively applied. The development area is cleared and developed.	Civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional as appointed by the proponent.	Loss of critical habitat for the koala, grey-headed flying-fox, swift parrot and regent honeyeater.
Risk of injury or mortality to koalas, grey-headed flying-fox, swift parrot and regent honeyeater from vegetation clearing and construction	All clearing will be undertaken in accordance with the SBMP. This will include: • Provisions for the proponent to engage a qualified Fauna Spotter Catcher to participate in all 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 ensure that no injury or deaths occur to Koalas or other fauna species. • Vegetation will be cleared sequentially. Clearing will be conducted so that fauna are flushed into safe, vegetated areas and it will avoid pushing fauna into fragmented areas. • Temporary fauna friendly fencing will allow fauna to safely disperse into vegetated areas away from construction, • Temporary fauna exclusion fencing will then be erected to prevent fauna dispersing into construction areas.	The use of a Fauna Spotter Catcher throughout clearing is an effective tool to: Identify they types of species on site prior to clearing; and identify and flag habitat features that require thorough examination before clearing. Fauna Spotter Catchers have a primary role to ensure no fauna are in vegetation before it is cleared. Given the size of koalas and their utilisation of tree branches, they can quite easily be observed from the ground. As such, it is extremely unlikely that a koala will be killed or injured during vegetation clearing, particularly given the onerous and thorough procedures set out The Draft Code. Given grey-headed flying-foxes are nocturnal, there is minimal risk of mortality from vehicle collision. Restricted operation hours (i.e., daylight hours) is considered an effective mitigation measure to minimise this risk. 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,	Fauna Spotter Sequential Clearing Temporary fauna friendly tree protection fencing to allow fauna to escape into refuges during clearing Restricted construction hours	Present at all times during clearing works At all times during clearing At all times during clearing At all times during construction	Fauna Spotter not present and Koala injured or killed Sequential clearing not undertaken and fragmentation induced Temporary fencing not installed and koala or other fauna are injured or killed Works outside of hours	No injury or death to Koalas during clearing Clearing completed as per sequential clearing Temporary fencing utilised at all times during the clearing process Works area completed within mandated hours	Civil contractor as appointed by the proponent and DETSI certified Fauna spotter catcher as appointed by the civil contractor. Civil contractor as appointed by the proponent and DETSI certified Fauna spotter catcher as appointed by the civil contractor. Civil contractor as appointed by the proponent. Civil contractor as appointed by the proponent.	Post-services Wildlife Report completed after each clearing event by the appointed fauna spotter catcher. Post-services Wildlife Report completed after each clearing event by the appointed fauna spotter catcher. Pre-start checklist and inspection, sign-off by environmental coordinator prior to clearing and monthly contractor reports prepared by the civil contractor. Monthly contractor reports prepared by the civil contractor.	The use of a Fauna Spotter is mandated **No residual impact** Sequential clearing is mandated and guided by VCFMP and pre-clearance checklists and pre-starts **No residual impact** Temporary fauna fencing is mandated and guided by the SBMP and pre-clearance checklists and pre-starts **No residual impact** Works hours are mandated and guided by the SBMP. **No residual impact**

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure item	Timeline for delivery	Risk Assessment	Milestone	Responsible Party	Monitoring Program	Environmental Outcome
	• Restricted construction hours (i.e. daylight 6am -6pm) • Prohibition of companion /security animals (e.g. dogs). • Restricted vehicle speeds (e.g. max 40 km) within construction areas. In addition to this, all construction personnel shall attend environmental training as part of the site induction process prior to entering the work site. As part of this training all personnel will be instructed on their obligations in regard to vehicle movement and construction speed limits.	again minimising the risk of injury of death. Each of these measures will ensure that the risk of injury or death to koalas or grey-headed flying-foxes as a result of construction are avoided and mitigated. The aim of these procedures is to support zero injuries or death to identified MNES threatened species as a result of construction.	Dog prohibitions	At all times during construction	No companion and security dogs on-site	Construction completed without dogs on-site	Civil contractor as appointed by the proponent.	Monthly contractor reports prepared by the civil contractor.	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	Civil contractor as appointed by the proponent.	Monthly contractor reports prepared by the civil contractor.	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	Civil contractor as appointed by the proponent.	Monthly contractor reports prepared by the civil contractor.	Inductions are mandated and guided by the SBMP. **No residual impact**
Fragmentation of habitat for koala, grey-headed flying-fox, swift parrot and regent honeyeater during construction	Vegetation clearing has the risk of fragmenting habitat areas during the construction phase. To avoid this impact, vegetation will be undertaken sequentially to allow fauna 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 Cather WHIMPs. Clearing will be undertaken in a way that flushes fauna into connected areas of habitat and will avoid flushing fauna into fragmented or hostile areas. Specifically: • Fauna are not required to cross roads or move through developed or disturbed areas, such as residential areas of areas that require movement greater than 100 m over cleared ground to reach suitable habitat; • Fauna are not left occupying an 'island' of habitat between hostile environments, such as road and cleared areas; • Fauna can safely leave the site of clearing and relocate to adjacent habitat;	Habitat isolation and fragmentation is a primary concern due to its impacts on fauna. Koalas, GHFF, swift parrot and regent honeyeater are able to disperse through a variety of environs, including bushland and cleared areas. 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 Council open space and thus will not be subject to fragmentation in the future. As such. No residual impacts are anticipated.	Fauna not fragmented from adjoining habitat during clearing	Fauna are not fragmented from habitat during clearing. Sequential clearing is undertaken at all times during clearing.	Fauna are fragmented by clearing	Clearing completed without fauna being fragmented	Civil contractor as appointed by the proponent.	Post-services Wildlife Report completed after each clearing event by the appointed fauna spotter catcher.	Sequential clearing is mandated and guided by the SBMP and pre-clearance checklists and pre-starts **No residual impact**
			Temporary fauna exclusion fencing prevent fauna from moving into construction areas	At all times during construction	Temporary fauna exclusion fences are not installed	Temporary fencing utilised at all times during construction	Civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional as appointed by the proponent and monthly contractor reports prepared by the civil contractor.	Temporary fauna fencing is mandated and guided by the SBMP and pre-clearance checklists and pre-starts **No residual impact**
			Stockpiling of cleared vegetation ensures safe fauna movement	At all times during clearing	Stockpiling creates a barrier to fauna	Stockpiling is undertaken as per the VCFMPs and SBMP	Civil contractor as appointed by the proponent.	Monthly contractor reports prepared by the civil contractor.	Safe stockpiling is mandated and guided by the 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	Civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably	Fauna go-slow and fencing measures are applied at corridor

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure item	Timeline for delivery	Risk Assessment	Milestone	Responsible Party	Monitoring Program	Environmental Outcome
	• Demarcation fencing will be fauna friendly to ensure fauna are not trapped within the proposed cleared extent; and • Cleared vegetation is to be stockpiled as to not impede fauna movement.							qualified professional as appointed by the proponent and monthly contractor reports prepared by the civil contractor.	crossings as per the SBMP and pre-clearance checklists and pre-starts **No residual impact**
	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.		Low vehicle speeds	At all times during construction	Speed limits are breached resulting in fauna strike	No speed limit breaches during construction	Civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional as appointed by the proponent and monthly contractor reports prepared by the civil contractor.	Speed limits are mandated and guided by the SBMP **No residual impact**
Disturbance to koala, grey-headed flying-fox, swift parrot and regent honeyeater during construction	The SBMP will include controls to avoid, minimise and mitigate risk of disturbance to MNES habitat during construction, specifically: <u>Light and noise disturbance</u> Construction of the project will result in increased noise and light disturbance. These impacts may disturb fauna and disrupt foraging, reproduction or movement behaviours. Restricted construction hours (e.g. 6am-6pm) will limit disruption from light and noise impacts, as well as allow a 12 hour period for fauna to disperse and forage.	Construction management and clearing controls implemented by the SBMP are considered to be able to effectively avoid, minimise and mitigate risk of disturbance to koala and other MNES species 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.	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	Civil contractor as appointed by the proponent.	Monthly contractor reports prepared by the civil contractor.	Light and noise restrictions mandate works between 6 am and 6 pm in the SBMP. **No residual impact**
			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	Civil contractor as appointed by the proponent.	Monthly contractor reports prepared by the civil contractor.	The SBMP and VCFMP will mitigate the risk of contamination and weed and pathogen incursion **No residual impact**
	<u>Contamination, weeds and pathogens</u> 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 minimised- reduce number of access tracks and/or haul roads	At all times during construction	As Fauna disturbance, Injury or mortality from vehicles	Fauna disturbance, Injury or mortality from vehicles does not occur	Civil contractor as appointed by the proponent.	Monthly contractor reports prepared by the civil contractor.	As above **No residual impact**
			Barriers to dispersal are not created	At all times during construction	Vegetation clearing and stockpiling creates a barrier to fauna	Vegetation clearing and stockpiling is undertaken as guided by the VCFMP	Civil contractor as appointed by the proponent and DETSI certified Fauna spotter catcher as appointed by the civil contractor.	Monthly contractor reports prepared by the civil contractor.	As above **No residual impact**
								Monthly contractor reports prepared by the civil contractor.	Site induction mandatory **No residual impact**

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure item	Timeline for delivery	Risk Assessment	Milestone	Responsible Party	Monitoring Program	Environmental Outcome
	<u>Vehicle disturbance</u> 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. <u>Barriers to dispersal</u> 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. <u>Contractor management</u> 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 koala and grey-headed flying-fox will be presented in a toolbox talk.		Inductions and training Adaptive management	At all times during construction At all times during construction	Inductions avoided Adaptive management not applied	All inductions are completed and records maintained Adaptive management utilised if required	Civil contractor as appointed by the proponent. Civil contractor as appointed by the proponent.	Monthly contractor reports prepared by the civil contractor.	The SBMP will include adaptive management strategies to avoid recurrence of adverse incidents should they occur. **No residual impact**
Hydrological changes	Stormwater detention technologies will be utilised to minimise the effects of excess rainwater flowing into catchments caused by the creation of hardstand areas. All work will be undertaken in accordance with appropriate management plans to ensure the hydrological changes across the site do not impact on surrounding vegetation.	The implementation of a project wide Stormwater Management Plan as designed by certified engineers ensures that hydrological change area appropriately accounted for and managed. These management measures will reduce impacts from higher levels of surface water flow caused by hardstand areas and ensures natural drainage lines continue to function as they naturally would have. Stormwater detention basins prevent localised flooding of drainage lines and waterways caused by increased runoff over hardstand areas	Hydraulic and Stormwater Management Plan	To be approved prior to works	Unforeseen hydrological changes	No worsening of hydrological impacts as a result of the development	Hydraulic engineer as appointed by the proponent.	Monthly contractor reports prepared by the civil contractor.	Stormwater Management Plans to be prepared where required as part of OPW approvals which will be prepared by the engaged hydraulic engineers for operational works phases of the project. **No residual impact**

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure item	Timeline for delivery	Risk Assessment	Milestone	Responsible Party	Monitoring Program	Environmental Outcome
		and also contribute to maintaining water quality levels.							

5.6.2 Operational impacts

Table A50: Operational Impacts

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure item	Timeline for delivery	Risk Assessment	Milestone	Responsible Party	Monitoring Program	Environmental Outcome
Risk of injury of death to MNES from vehicle strike	A number of measures will be imposed to avoid and mitigate the risk of koalas being hit by vehicles. Although the risk to vehicle strike is low, these measures will be concurrent for grey-headed flying-fox, swift parrot and regent honeyeater. These measures include: • MNES food trees will not form part of the primary landscaping of the development footprint so that koalas, grey-headed flying-fox, swift parrot and regent honeyeater are not enticed to enter residential areas. • Imposition of low vehicle speeds to reduce the risk of collisions. Vehicle speed limits are restricted to 50km/h on built up residential roads. • Installation of traffic calming devices, fauna movement infrastructure and wildlife crossing awareness signage (where required). • Installation of koala awareness signage along esplanade roads to raise awareness of the species' presence in the area.	The purpose of these avoidance and mitigation measures is to minimise the risk of injury or death to koalas from vehicle strike. These measures will also mitigate risks for grey-headed flying-fox, swift parrot and regent honeyeater. It will be important to minimise the incentive for these species to enter residential areas by restricting the availability of habitat in these areas. As such, street scaping will not be planted with suitable habitat, which will in turn encourage koalas to stay away from the development area. Importantly, low vehicle speeds will be imposed along residential roads, minimising the risk of high-speed vehicle strikes which were identified in the literature review as accounting for a large proportion of vehicle related deaths. In addition, awareness signage will ensure motorists are aware that koalas have potential to occur in the area, making them more conscious of potentially dispersing koalas and encouraging them to maintain a low vehicle speed. The purpose of these measures is to enable the objective of no injury or death to koalas as a result of vehicle strike. No residual impacts can be identified.	Provision of open space buffer adjoining vegetation retention area	To be delivered with adjoining urban development	Open space buffer not delivered	Open space buffer delivered	Urban designer and landscape contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	**No residual impact**
			Permanent speed limit signage and reduced speeds	During construction of roads	Vehicles speeding	No koala deaths from vehicle strike	Landscape architect and civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	Low vehicle speeds will be signed and enforced as for public roads **No residual impact**
			Koala awareness signage installed along roads adjoining vegetation retentions areas	At construction of roads and Council on-maintenance phase	Signs not installed	Signs installed progressively with construction of development	Landscape architect and civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	Koala awareness signage will be delivered where appropriate under the SBMP. **No residual impact**
			Fauna crossing infrastructure installed where roads intersect retained vegetation	At construction of roads prior to opening to the public	Crossing not operation prior to public use of the road	Design of crossing completed and crossing installed, on-maintenance certification provided by Ipswich City Council	Engineer as appointed by the proponent responsible for design. Civil contractor responsible for installation.	Annual Compliance Report completed by an engaged suitably qualified professional, on-maintenance certification by Ipswich City Council.	**No residual impact**
			Fauna awareness road markings along esplanade roads and crossings	At construction of Mur Boulevard prior to opening of the road to the public	Markings not installed prior to public use of the road	Design of crossing completed and crossing installed	Engineer as appointed by the proponent responsible for design. Civil contractor responsible for installation.	Annual Compliance Report completed by an engaged suitably qualified professional.	**No residual impact**
			Urban landscaping avoids use of MNES species foraging trees	Landscape design phase and planting during construction	Koala trees inadvertently utilised in urban areas	Urban landscape planting palette designed during operational works phase. Planting delivered with non-	Landscape architect and landscape contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	**No residual impact**

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure item	Timeline for delivery	Risk Assessment	Milestone	Responsible Party	Monitoring Program	Environmental Outcome
						Koala native species during construction.			
Risk of injury or death from dog attack	Dogs will be restricted from entering the vegetation retention area. Fauna awareness will be promoted through the installation of fauna awareness signage.	While dogs already occur within the local area, and wild dogs are known to occur on the site, the project will result in an increase in dog ownership numbers in the area. As such, the education of residents has been identified as a key management tool in reducing the risk or injury of dog attacks on koalas. Again, while the risk to grey-headed flying-fox is low, these measures will also be effective to reduce risk of dog attack on the species.	Dog restrictions including appropriate signage to promote responsible pet ownership including "dogs on leads at all times" and "dogs prohibited in vegetation areas."	At delivery of open space buffer areas during construction	Dogs are let off their leads by residents and access vegetation retention areas	Dog signage is designed and delivered. Council controls on dog ownership imposed.	Landscape architect and civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	Dogs will be managed to Council specifications and prohibited from entering the vegetation retention areas **No residual impact**
			Installation of outlook fencing and retaining walls along vegetation retention areas.	At delivery of open space buffer areas during construction.	Fencing does not prevent easy access of residents and dogs into vegetation areas.	Fencing is installed progressively with construction phasing of residential areas and adequately prevents access into vegetation retention areas.	Landscape architect and civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	**No residual impact**
Creation of barriers to dispersal / fragmentation of habitat	To mitigate these associated with the development, the Opossum Creek exclusion area will retain existing vegetation for koala, grey-headed flying-fox, swift parrot and regent honeyeater. Native fauna will largely be excluded from the proposed development and associated threats. Highly mobile fauna are not considered to be impacted by the creation of physical barriers created through the development of the referral area. Fauna movement infrastructure will be installed where roads intersect retained habitat. Crossings will include appropriate structures to enable movement such as fauna log rails, glider poles and koala exclusion fencing to funnel koalas and other fauna toward the crossing.	The development of residential areas across the estate will create barriers to movement in the form of houses, roads, fences and other infrastructure. However, as mentioned, the surrounding area is subject to ongoing development. While the expanse of areas suited for movement are to be reduced through residential development they are to be substantially improved in functionality through weed removal, replanting, fencing, signage and land tenure changes.	Provision of exclusion area within Opossum Creek to allow continue dispersal within the landscape.	During clearing and construction no impacts are to occur within exclusion area. Edge of vegetation area to be delineated by the location of outlook fencing installed during construction.	Construction mitigation measures (*i.e.,* fauna spotter catcher, sequential clearing, tree protection fencing) not implemented. Development timeline and sequence not followed.	No koalas within the impact area at construction completion.	Landscape architect and civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	Fauna usage occurs within the vegetation retention areas and facilitates landscape connectivity. **No residual impact**
			Fauna crossing infrastructure to allow unimpeded movement within vegetation retention areas.	At construction of roads intersecting vegetation and prior to opening of the road to the public.	Crossing not operation prior to public use of the road	Design of crossing completed and crossing installed, on-maintenance certification provided by Ipswich City Council	Engineer as appointed by the proponent responsible for design of the culvert. Civil contractor responsible for installation.	Camera monitoring at fauna culvert completed upon it becoming operational to be completed by suitably qualified ecologist. Findings to be documented in an Annual Compliance Report completed by an engaged suitably qualified professional.	Fauna movement is facilitated by the road crossing infrastructure. **No residual impact**

Impact	Avoidance and Mitigation Measures	Evaluation of the Effectiveness of Measures	Mitigation measure item	Timeline for delivery	Risk Assessment	Milestone	Responsible Party	Monitoring Program	Environmental Outcome
Indirect impacts on adjoining habitat including edge effects and weed invasion	The retained vegetation areas will be managed for MNES habitat value. Active management will occur in these areas including rehabilitation and weed management to be carried out in accordance with an approved RMP. Management will aim to ensure these areas of habitat are retained and continue to support the species and habitat quality is not degraded over time.	Active management will ensure no reduction in habitat quality within retained vegetation areas as a result of the project.	Weed management and infill planting.	Post-construction and during the operational phase.	Weeds increase in cover and infill planting not completed leading to same or reduced habitat quality.	Establishment and on-maintenance achieved with ICC.	Landscape architect and landscape contractor as appointed by the proponent.	Baseline weed cover and photo monitoring.	Management of edge effects and improvement to natural areas. **No residual impact**
Light spill into adjacent habitat	<u>Installation of fauna sensitive light design</u> Fauna sensitive lighting design will be utilised along esplanade roads adjoining the vegetation retention areas and natural areas associated with Opossum Creek. This includes installing shielded light fittings to minimise light spill into the natural areas and use of appropriate luminaire type identified as suitable for terrestrial mammal habitat under the *Commonwealth National Light Pollution Guidelines for Wildlife* (DCCEEW, 2023). Fauna sensitive lighting will be installed in accordance with recommendations under the Guideline and in accordance with industry standards *i.e., AS/NZS 1158 Set: 2010: Lighting for roads and public spaces* and *AS/NZS 4282:2019 Control of the obtrusive effects of outdoor lighting.*	Shielded light fittings and luminaire types that comply with AS/NZS 1158 and AS/NZS 4282:2019 – Control of the obtrusive effects of outdoor lighting is likely to be effective in limiting disturbance to MNES.	Installation of shielded light fittings and appropriate luminaire type.	During construction of roads / infrastructure.	Obtrusive lighting design is implemented, causing detrimental effects to native wildlife.	N/A	Landscape architect and civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	Effects to MNES and native fauna through light pollution are mitigated through successful implementation of fauna sensitive light design **No residual impact**
Soil and water runoff into retained vegetation	The stormwater management strategy will involve treating stormwater runoff from the development areas via a series of sediment basins and bioretention systems located around the edge of the development.	The stormwater management system has been designed using hydraulic modelling to ensure stormwater treatment and flows are effectively manage during the operation of the development.	Install bioretention system and sediment basins in accordance with an approved SMP.	Progressive – during construction of relevant development phase.	Sedimentation and untreated water flow into adjoining creekline areas.	N/A	Hydraulic engineer and civil contractor as appointed by the proponent.	Annual Compliance Report completed by an engaged suitably qualified professional.	Stormwater management occurs in accordance with the site-specific Stormwater Management Plan **No residual impact**

6. Proposed Offsets

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

This section responds to Item 6 of the PD request which states the preliminary documentation must ***"Demonstrate how the offset proposal:***

a) Meets the principles outlined in the EPBC Offsets Policy.

b) Address the considerations and requirements outlined in the EPBC Offsets Policy, including but not limited to sections 6 and 7 of the EPBC Offsets Policy.

c) Directly contributes to the ongoing viability of the EPBC listed species or ecological community or migratory species and will deliver an overall conservation outcome that improves or maintains the viability of the protected matter, as compared to what is likely to have occurred under the status quo, i.e. if neither the action nor the offset had taken place.

d) Compensates for the impact over the entire duration of the impact (i.e. should impacts be in perpetuity, the offsets must also be delivered in perpetuity).

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

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

Overall, the proposed residential development will see the direct removal of critical habitat for the Koala, Grey-headed Flying-fox, Regent Honeyeater and Swift Parrot. The residual impacts are summarised below.

6.1 Significant Residual Impact Summary

The assessment of construction and operational impacts in **Section 5** shows that there will be a residual impact from the unavoidable loss of **18.90 hectares** containing critical habitat for the Koala, GHFF, Swift Parrot and Regent Honeyeater. The management measures described throughout this Preliminary Documentation submission detail the proposed mitigation measures to reduce the risk of injury or mortality to the above MNES as a result of the action.

The following significant residual impacts for the above MNES are proposed:

Koala:	**Removal and 'functional loss' of 18.90 hectares of critical habitat at a MHQA score of 6.25 (rounded to 6.00)**
GHFF:	**Removal and 'functional loss' of 18.90 hectares of critical habitat at a score of score of 5.60 (rounded to 6.00)**
Swift Parrot:	**Removal of 3,339 habitat features**
Regent Honeyeater:	**Removal of 2,756 habitat features.**

6.2 Offset Proposal

A land-based offset is proposed to compensate for the habitat impacts associated with the proposed action.

The proposed offset area is located within the Rosevale Offset Property, located at Tarome Road, Tarome. The Rosevale Offset Property is >800 ha in size and is comprised of several allotments containing a combination of approved (EPBC 2021/9005) and proposed offset projects. The property is located approximately 9.5 km north-west of Aratula and located in the Scenic Rim Regional Council (SRRC) Local Government and is owned and managed by third-party offset provider Montauban Environmental Offsets (MEO).

The specific offset area proposed to compensate for impacts for EPBC 2020/8629 is the Rosevale Offset Area 3 (referred to as the 'ROA 3'). The ROA 3 is 41.3 ha in size and is located approximately 51 km south-west of the Peninsula Precinct impact area (refer **Plan A36** for offset property context). The site context and site aerial of the offset site are provided in **Figure A11** and **Figure A12**, respectively.

Rosevale Offset Property is contained on the following allotments:

- Part of Lot 1/CC3571
- Lot 103/CH311061
- Lot 115/SP167206
- Lot 116/SP167206
- Lot 211/CH311636

- Lot 229/CH312601
- Lot 24/CH312265
- Lot 230/CH312495
- Lot 4/RP31137
- Lot 71/CH311061
- Lot 72/CH311061
- Lot 77/CH311086
- Lot 9/CH311910
- Lot 86/RP234513
- Lot 68/CH311061

The proposed offset area (ROA 3) is contained on part of Lot 1/CC3571.

The land tenure of Rosevale is freehold, where it retains a rural land use zoning under the *Scenic Rim Planning Scheme 2020*. The offset property can be accessed via Moorang Lane off Tarome Road – both of which are rural roads. From the northern to the southern boundary the offset site spans 3.5 km and west to west covers 3.6 km. The offset site is currently zoned as Rural and is located adjacent to a core Biodiversity Corridor under the local government planning scheme, discussed in the following sections. Key site details for the offset area are provided in **Table A51**.

Although located within reasonable proximity of a number of MNES impact areas occurring in South East Queensland the broad conservation benefits of the Rosevale offset property are realised through its achievement of multi-jurisdictional biodiversity outcomes. The major offset property is located within the same bioregional and sub-bioregional as three of the largest housing supply areas in South East Queensland, including the City of Greater Springfield and the Greater Ripley, Greater Flagstone and Yarrabilba Priority Development Areas. To implement long planned infrastructure outcomes and housing targets these major development areas will continue to see reductions in MNES habitat through both direct and indirect impacts. The Rosevale Offset Project will protect and improve existing values and significantly reinstate and create new habitat strategically located within the same sub bio-regional ecological context where MNES habitat is being reduced (refer **Figure A13 and Figure A14**).

Table A51: Rosevale Offset Area 3 (ROA 3) Summary

Offset Site Address	**1 Moorang Lane, Moorang, Queensland, 4340**
Lot / Plan	Part of Lot 1 on CC3571
Area	41.3 ha of a 121.4 ha lot
Tenure	Freehold
Current Land Use	Cattle grazing and cropping
Local Government Area	Scenic Rim Regional Council

A36. Offset Property Context



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 Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

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Legend

- Referral Area
- Offset Area

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 1 2 3 4 5 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:145,000 @ A3

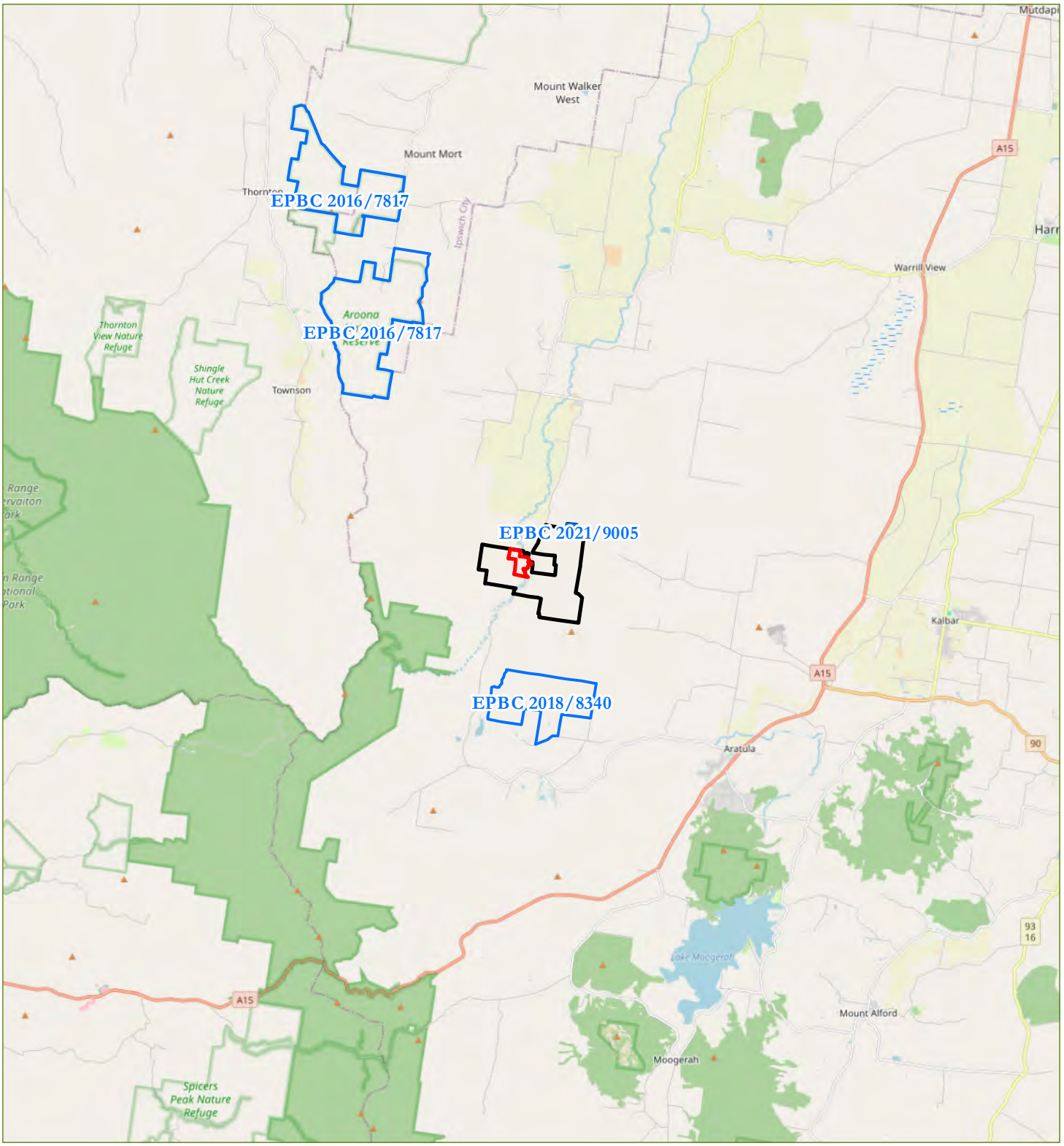
saunders havill group

SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A36 Offset Property Context F



Legend

- Offset Properties
- Offset Area
- Existing Approved Offset

Figure A11

Offset Area Context

Springfield City Group Pty Ltd

File ref. 7399 E Figure A11 Offset Context F
Date 18/08/2026
Project Peninsula Precinct

0 1 2 3 4 5 km

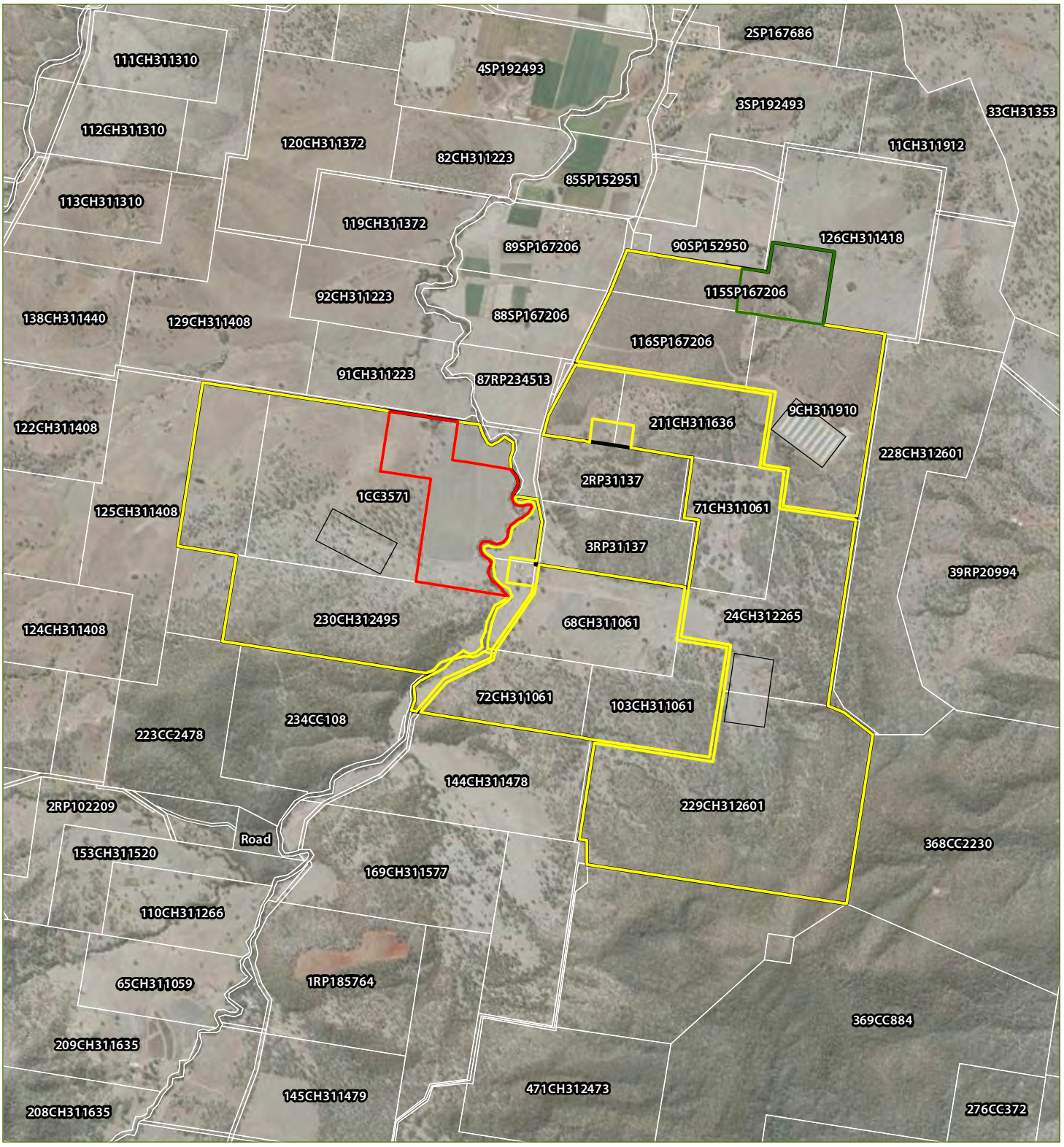
N

Scale (A4): 1:200,000 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland 2021



Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Poultry Sheds
- Offset Properties

Figure A12

Offset Area Aerial

Springfield City Group Pty Ltd

File ref. 7399 E Figure A12 Offset Aerial F
Date *18/08/2026*
Project *Peninsula Precinct*

0 200 400 600 800 1,000 *m*

Scale (A4): 1:30,000 [GDA 1994 MGA Z56]

N

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Legend

- IBRA - Subregions
- Offset Properties
- Impact site

Figure A13

Interim Biographical Regionalisation of Australia - Moreton Basin Sub-Region

Springfield City Group Pty Ltd

File ref. 7399 E Figure A13 Offset IBRA F
Date *18/08/2026*
Project *Peninsula Precinct*

0 2 4 6 8 10 *km*

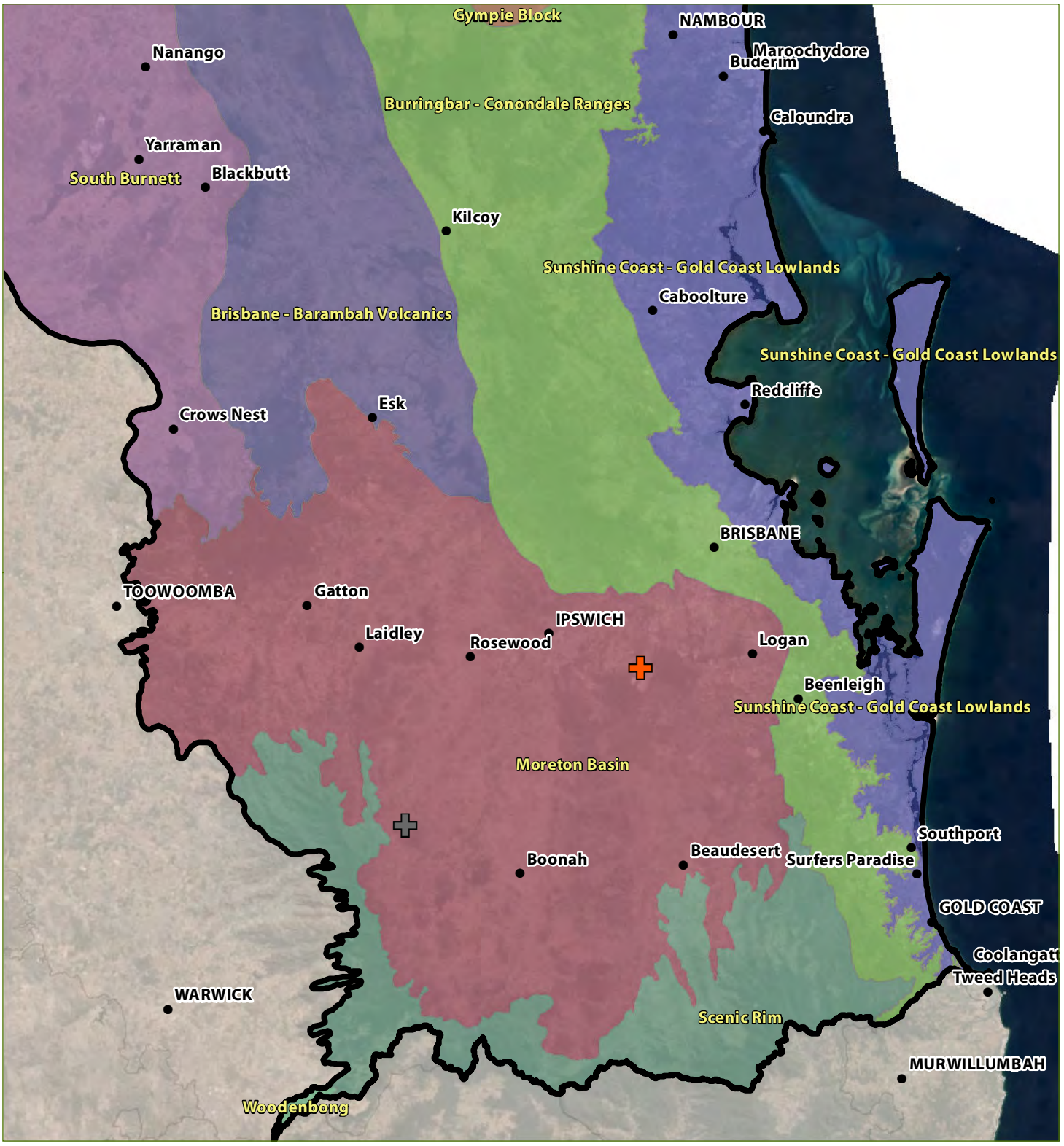
Scale (A4): 1:350,000 [GDA 1994 MGA Z56]

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Legend

- South East Queensland Bioregion
- Offset Properties location
- Impact site location

Figure A14

South East Queensland - Bioregion 12 Biographical Subregions

Springfield City Group Pty Ltd

File ref. 7399 E Figure A14 Bioregion 12 F
Date *18/08/2026*
Project *Peninsula Precinct*

0 5 10 15 20 25 *km*

Scale (A4): 1:1,000,000 [GDA 1994 MGA Z56]

N

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6.2.1 Offset Management Plan

To support the response to Item 6 of the PD Request, an Offset Management Plan has been prepared and is provided at **Attachment A9** of this submission package.

The OMP is proposed to function as a standalone document which includes the following details:

- Offset suitability analysis for each MNES and assessment against the Environmental Offsets Policy (EOP).
- Baseline survey methodologies and results including habitat quality for each MNES and threats being feral animal abundance and weeds (particularly Weeds of National Significance).
- Detailed management actions and justification for each management action designed to achieve the targets stipulated. Includes maps and plans where applicable demonstrate implementation of management actions.
- Completion criteria and interim milestone targets to achieve the impact compensation.
- Rehabilitation Management Plan including monitoring and reporting mechanisms to track against the interim milestone targets and completion criteria.
- Adaptive management framework.

Upon EPBC Act Approval, the offset area will be legally secured by a Voluntary Declaration (VDEC) under the Queensland *Vegetation Management Act 1999*.

The OMP identifies outcomes focused on management actions pursuant the EPBC Act, for the provision of Koala (*Phascolarctos cinereus*), Grey-headed Flying Fox (*Pteropus poliocephalus*), Regent Honeyeater (*Anthochaera phrygia*) and Swift Parrot (*Lathamus discolor*) habitat offset. The management objections for the offset, in alignment with EOP will:

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

6.2.2 Offset approach for Swift Parrot and Regent Honeyeater

The Swift Parrot and Regent Honeyeater offsets utilise a feature-based offset method which measures the offset as the reinstatement of habitat features within the offset area. A certain number are required to be reinstated to achieve the offset outcomes for either species.

Due to the specific habitat requirements and relatively narrow definition of a habitat feature, being a preferred foraging species as defined under the *National Recovery Plan for the Swift Parrot* (DCCEEW, 2024) and *National Recovery Plan for the Regent Honeyeater* (DoE, 2016), the offset delivery has been coordinated over a larger area, extending beyond the ROA 3. This has been done in order to include vegetation types which cover the habitat planting requirements for both species.

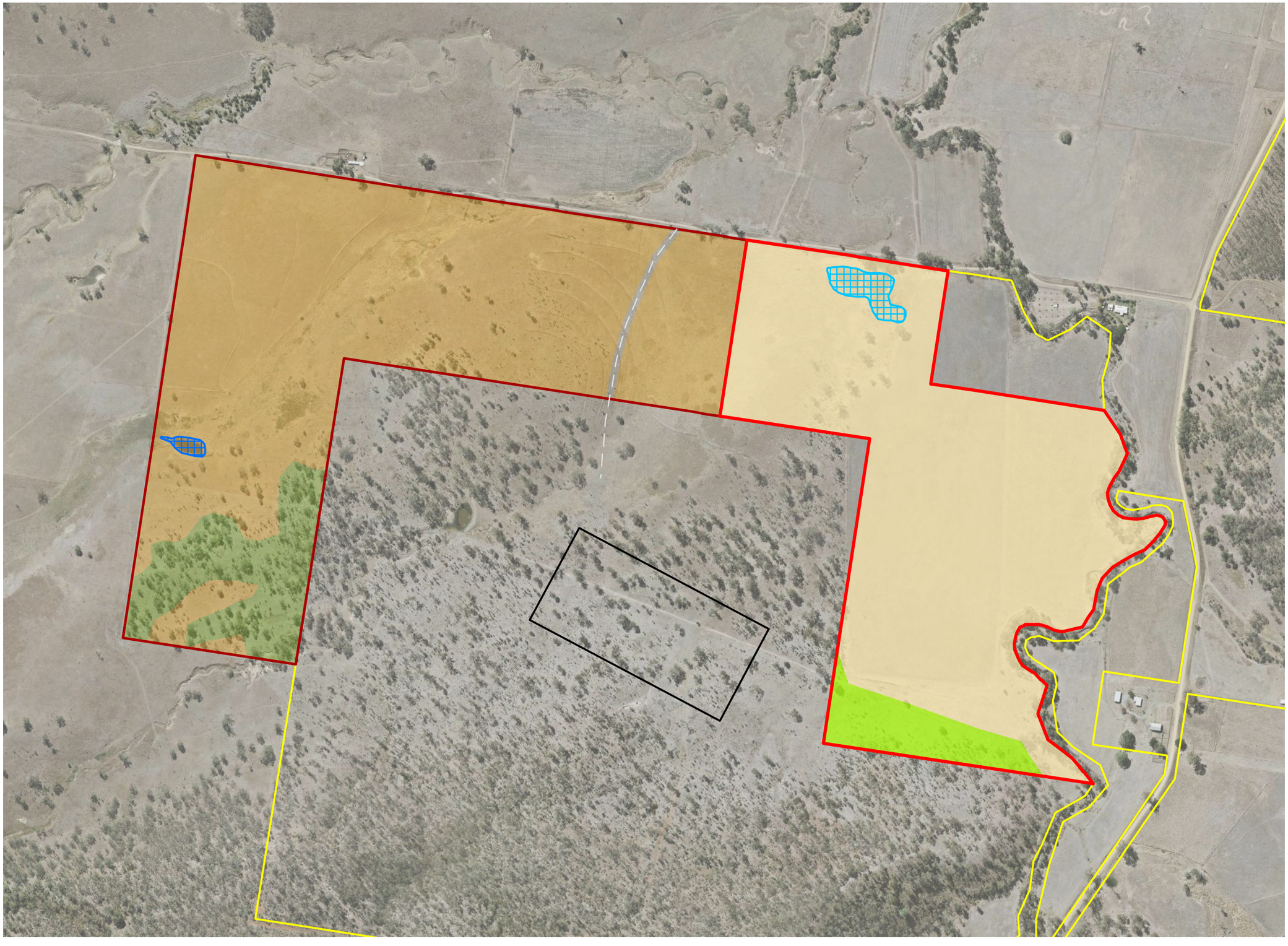
The adjoining offset area included in the offset planting outcomes for the Swift Parrot and Regent Honeyeater is referred to as the Rosevale Offset Area 4 (ROA 4) and is located within the same property as ROA 3. The ROA 4 includes a land-based offset for impacts for the Scenic Precinct (EPBC 2020/8651) of which the impact area adjoins the Peninsula Precinct impact area and is driven by the same proponent (Springfield City Group) and the offsetting impacts for the same matters.

As such a combined impact and offset assessment for EPBC 2020/8629 (Peninsula Precinct) and EPBC 2020/8651 (Scenic Precinct) has been completed for the Swift Parrot and Regent Honeyeater to coordinate planting obligations across the ROA 3 offset area (Peninsula Precinct) and adjoining ROA 4 offset area (Scenic Precinct).

Rehabilitation approaches have been designed with respect to both project areas. Rehabilitation will be implemented concurrently for both projects to ensure offset outcomes for the Swift Parrot and Regent Honeyeater are not subject to timeframes associated with the development implementation.

Refer to **Plan A37** for the location of planting areas for the Swift Parrot and Regent Honeyeater.

A37. Offset Planting Areas



Notes:
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Legend

- Future Offset Boundary
- Proposed Chicken sheds
- Poultry shed access track
- ROA 3 Offset Area
- ROA 3 Waterbodies [0.8 ha] - No Planting
- ROA 4 Offset Area
- ROA 4 Waterbodies [0.2 ha] - No Planting

Offset Planting Area – ROA 3

- ROA 3 Assessment Unit 1: Non-remnant RE 12.3.3 [37.1 ha]
- ROA 3 Assessment Unit 2: Regrowth RE 12.8.17/12.8.14 [3.4 ha]

Offset Planting Area – ROA 4

- ROA 4 Assessment Unit 1: Non-remnant RE 12.8.17/12.8.14 [44.9 ha]
- ROA 4 Assessment Unit 2: Regrowth RE 12.8.17/12.8.14 [6.7 ha]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 50 100 150 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:7,000 @ A3

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Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A37 Offset Planting Areas F

6.2.3 Offset Assessment Guide – Summary of MNES Impact Compensation

6.2.3.1 OAG Parameters

The habitat scores derived for the offset area have been used to assess whether the proposed offset property could be viewed as suitable in respect to meeting the offset obligation for the proposed action, using the Commonwealth's Offset Assessment Guide (OAG) calculator. Values for the other parameters used in the calculator for Koala and Grey-headed Flying-fox are summarised in **Table A52** and in **Table A53** for the Swift Parrot and Regent Honeyeater.

Table A52: Offset Assessment Guide Parameters – Koala and Grey-headed Flying-fox

Parameter	Rationale
Quantum of Impact (Area)	11.34 ha for Koala and 11.34 ha for Grey-headed Flying-Fox.
Quantum of Impact (Quality)	A score of 6 for Koala and 6 for Grey-headed Flying-fox.
Risk Related Time Horizon	The proposed offset area will be legally secured via the VDEC mechanism; hence, the maximum score of 20 years.
Time Until Ecological Benefit	Measures prescribed in this Offset Management Plan are expected to achieve the predicted increase in habitat quality over a period of 20 years.
Start Area	41.3 ha
Start Quality	Refer **Table A54** and **Table A55**.
Risk of Loss without Offset	It is understood risk of loss is to be set at 0% without any comprehensive evidence to the contrary.
Risk of Loss with Offset	It is understood risk of loss is to be set at 0% without any comprehensive evidence to the contrary.
Confidence in Result (Risk of Loss)	As risk of loss is set at 0%, a high score of 90% is used for confidence in result.
Future Quality without Offset	Existing habitat quality is expected to be maintained if the current land use / management regime is continued, Under management for grazing over 20 years and without the offset, current habitat quality for Koala and Grey-headed Flying-fox is unlikely to improve, and some attributes may deteriorate where regrowth is subject to periodic clearing for cattle grazing and/or maintenance/fire regimes that are not compatible with

Parameter	Rationale
	ecosystem improvement are employed. Refer **Table A54** and **Table A55**.
Future Quality with Offset	Refer **Table A54** and **Table A55**.
Confidence in Result (Future Quality)	85% for all Assessment Units. This high level of confidence is supported by a detailed Rehabilitation Management Plan developed for the offset area. This is described in **Attachment A9 OMP – Section 7** and provided at **Attachment A9 OMP – Appendix F**.

Table A53: Offset Assessment Guide Parameters (Feature-based) – Swift Parrot and Regent Honeyeater

Parameter	Rationale
Quantum of Impact	Swift Parrot – 1755 features at Scenic impact site and 3339 features at Peninsula impact site for a combined impact of 5094. Regent Honeyeater – 1891 features at Scenic impact site and 2756 at Peninsula impact site for a combined impact of 4647.
Risk Related Time Horizon	The proposed offset area will be legally secured via the VDEC mechanism; hence, the maximum score of 20 years.
Start Value	Refer **Table A56** and **Table A55**.
Future Value Without Offset	Existing habitat quality is expected to be maintained if the current land use / management regime is continued. Under management for grazing over 20 years and without the offset, current habitat quality for Swift Parrot and Regent Honeyeater is unlikely to improve, and some attributes may deteriorate where regrowth is subject to periodic clearing for cattle grazing and/or maintenance/fire regimes that are not compatible with ecosystem improvement are employed. Refer **Table A56** and **Table A55**.
Future Value With Offset	Refer **Table A56** and **Table A55**.
Confidence in Result (Future Quality)	85% for all Assessment Units. This high level of confidence is supported by a detailed Rehabilitation Management Plan developed for the offset area. This is described in **Attachment A9 OMP – Section 7** and provided at **Attachment A9 OMP – Appendix F**.

6.2.3.2 Impact Compensation and Scoring Uplift

A summary of proposed habitat quality uplift and the EPBC Act offset assessment guide impact compensation are included in **Table A54 to Table A57**, below. The completed EPBC Act offset assessment guide calculator sheets are included at **Attachment A9 OMP – Appendix B**.

Table A54: Koala impact compensation and scoring uplift (ROA 3)

Assessment Unit	Area (ha)	Habitat Quality Score		Offset Acquittal
		Baseline	Future	
AU1	37.9	3	7	109.18%
AU2	3.4	6	7	2.45%
Total	**41.3**			**111.63%**

Table A55: Grey-headed Flying-fox impact compensation and scoring uplift (ROA 3)

Assessment Unit	Area (ha)	Habitat Quality Score		Offset Acquittal
		Baseline (rounded score)	Future	
AU1	37.9	3	8	136.48%
AU2	3.4	3	8	12.24%
Total	**41.3**			**148.72%**

Table A56: Swift Parrot impact compensation (ROA 3 and ROA 4)

Assessment Unit	Start value	Future value without offset	Future value with offset (inclusive of 90% survival rate)	Impact compensation
SCENIC – AU1	0	0	20,205	90.45%
SCENIC – AU2	0	0	603	2.70%
PENINSULA – AU1	1113	1113	14,469	59.79
PENINSULA – AU2	434	434	740	1.36
Total	**1547**	**1547**	**36,017**	**154.30%**

Note:
Start value inputted as the existing number of non-juvenile preferred foraging trees
Future value without offset inputted as the existing number of non-juvenile preferred foraging trees
Future value with offset inputted as net total of preferred foraging trees (*i.e.,* number to be planted inclusive of a 90% survival rate + number of existing)

Table A57: Regent Honeyeater impact compensation (ROA 3 and ROA 4)

Assessment Unit	Start value	Future value without offset	Future value with offset (inclusive of 90% survival rate)	Impact compensation
SCENIC – AU1	0	0	19,801	97.16%
SCENIC – AU2	0	0	591	2.90%
PENINSULA – AU1	0	0	0	0%
PENINSULA – AU2	0	0	300	1.47%
Total	**0**	**0**	**20,692**	**101.54%**

Note:
Start value inputted as the existing number of non-juvenile preferred foraging trees
Future value without offset inputted as the existing number of non-juvenile preferred foraging trees
Future value with offset inputted as net total of preferred foraging trees (*i.e.,* number to be planted inclusive of 0.75 adjusted weighting for the count of supporting species and 90% survival rate + number of existing)

6.3 Offset Area Values

6.3.1 Assessment Units

The ROA 3 contains is predominantly comprised of degraded landscape, previously used for cattle grazing and cropping with scattered large trees and patches of regrowth vegetation in the southern portion of the area. The majority of the site is designated as Category X (non-remnant) vegetation under the Queensland VMA described as RE12.3.3 with a small patch of Category C (regrowth) vegetation described as composite RE12.8.17/12.8.14.

The ROA 3 is delineated into two Assessment Units being Assessment Unit 1 (Non-remnant Paddock RE 12.3.3) and Assessment Unit 2 (Sparse Regrowth RE 12.8.17/12.8.14). Refer to **Plan A38** for the ROA 3 Assessment Units.

Assessment Unit 1 – Non-remnant Paddock RE12.8.17/12.8.14

AU 1 consists of historically cleared open paddocks. This AU is characterised by its lack of structural complexity with a generally absent native tree, shrub and forb species presence and is dominated by native grass species such as, *Heteropogon refractus*, *Imperata cylindrica* and *Themeda triandra* (refer **Photo set 7**). This AU contains sporadic weed infestations with Lantana camara infestations observed throughout the area. AU 1 contains limited habitat values for MNES.

Assessment Unit 2 – Sparse Regrowth RE12.8.17/12.8.14

AU 2 consists of sparse regrowth dominated by RE12.8.17. The area contains a characteristic of regrowth vegetation including small-stemmed eucalypt trees with a sparse overstorey (refer **Photo set 8**). The vegetation is dominated by *Eucalyptus crebra* with E. *melanophloia, Corymbia tessellaris, C. intermedia* and *Acacia leiocalyx*.

6.3.2 Water Resources

The Rosevale offset property contains numerous man-made farm dams which have been utilised for historic cropping and agricultural purposes. Natural water resources on-site are defined by the Bremer River which straddles the eastern boundary of the western parcels of the Rosevale offset property (Lot 230/CH312495 and Lot 1/CC3571). Additional to this major waterway, a network of mapped watercourses and drainage features as defined under the VMA are observed throughout much of the Rosevale Offset Property. In regard to water resources in the ROA 3 offset, a mapped low-risk DPI waterway traverses through the centre of the lot which flows into the Bremer River to the north, a reservoir is present along the western boundary connecting to this drainage feature and two constructed dams are present at the northern extent. Refer to **Plan A39** for the identification of the water resources on the offset property.

The Rosevale offset property encompasses up to the low bank of the Bremer River with the low-bank un-allocated state land which is not within the proposed offset area. In its current state much of the Bremer River's vegetation is in a modified state due to cattle grazing activities. In the broader Rosevale Offset site holdings, offset management actions adjacent to the waterway will include weed management and rehabilitation plantings.

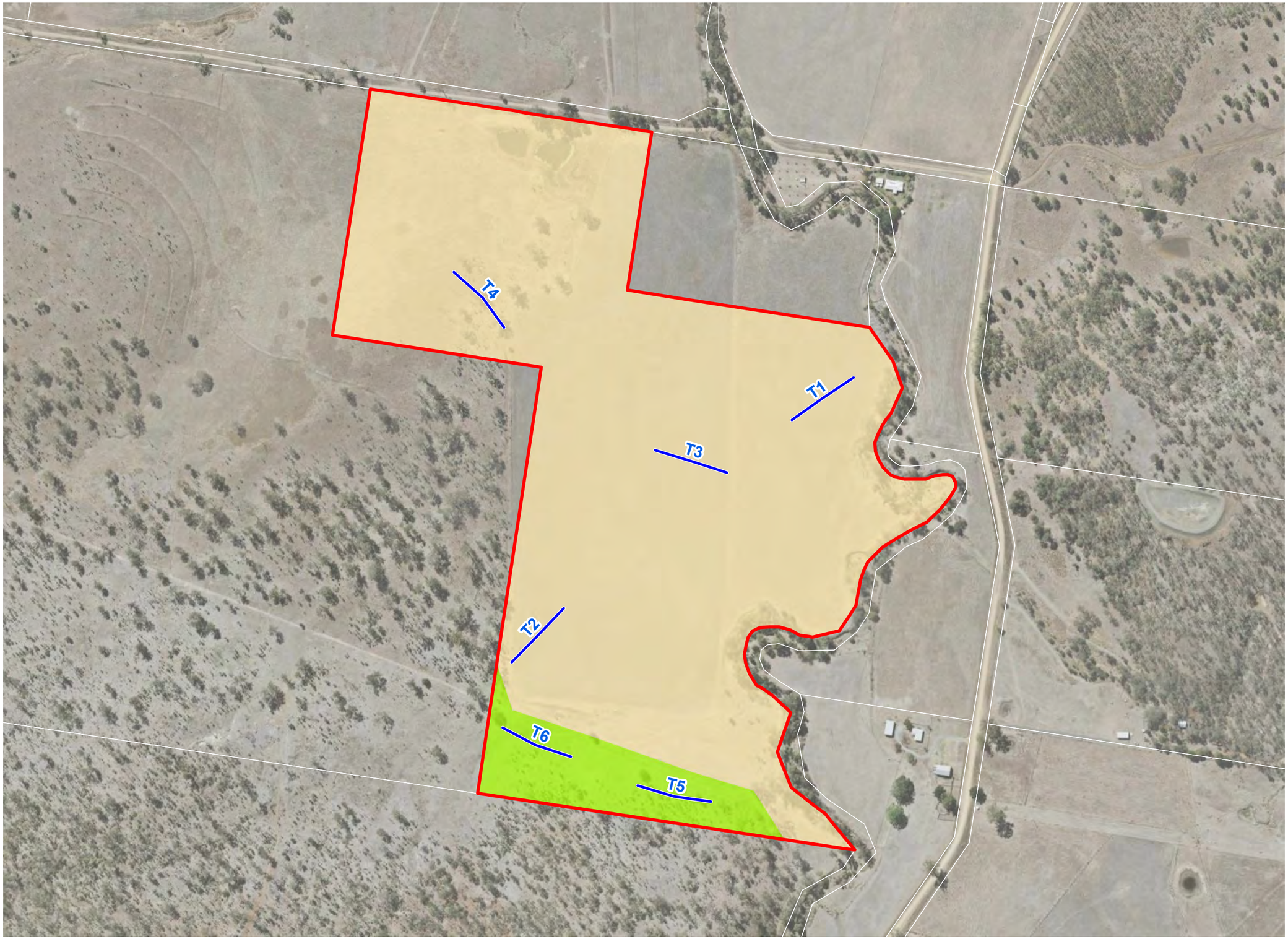


Photo set 7: AU1 – Non-remnant Paddock Vegetation



Photo set 8: AU2 – Sparse Regrowth Vegetation

A38. Offset Area Assessment Units



Notes:
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Legend

- Qld DCDB
- Offset Area
- MHQA Transects

Assessment Units

- Assessment Unit 1: Non-Remnant RE 12.3.3 [37.9 ha]
- Assessment Unit 2: Regrowth RE 12.8.17/12.8.14 [3.4 ha]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 50 100 150 200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:5,000 @ A3

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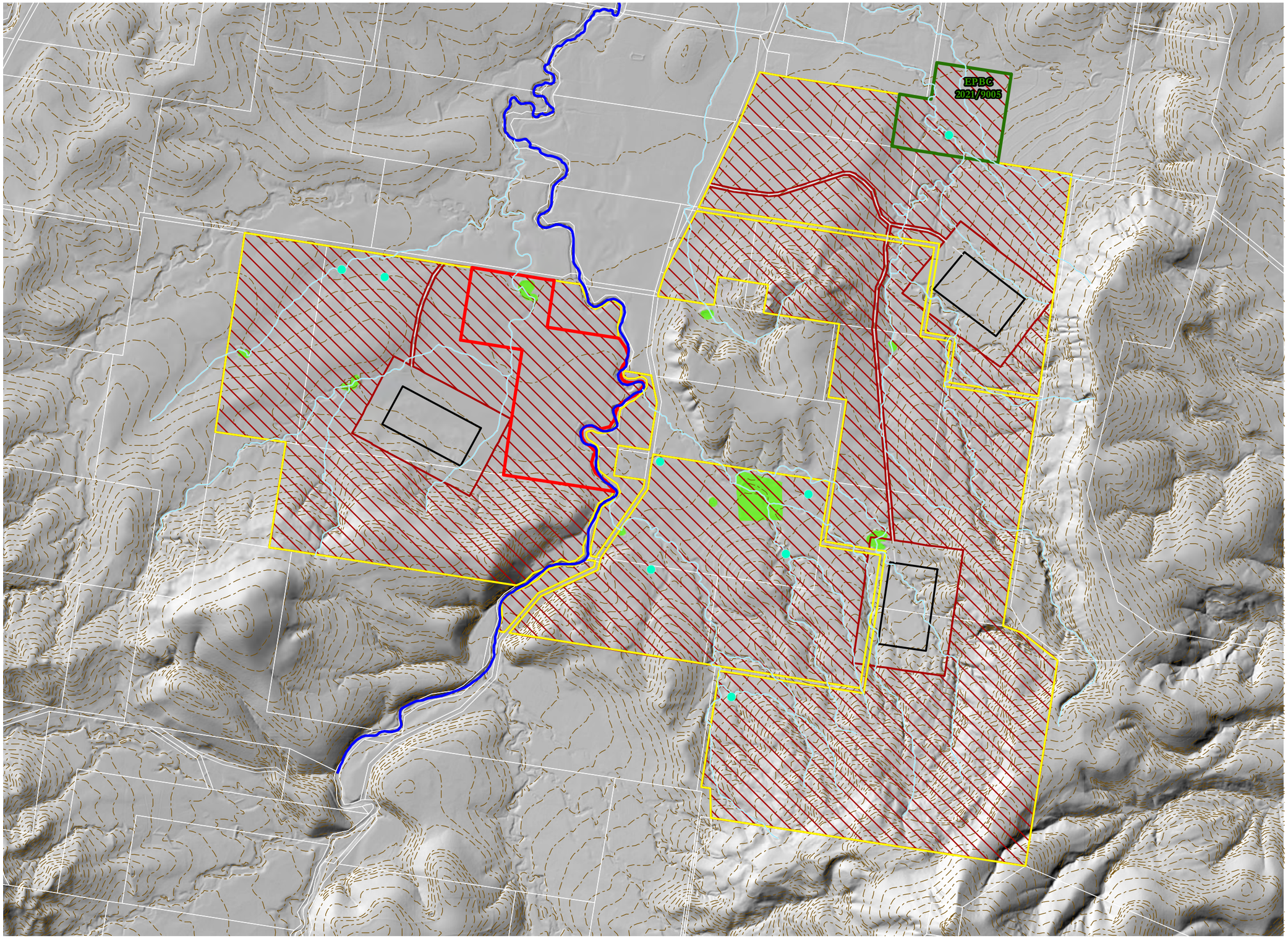
SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A38 Offset Area Assessment Units F

A39. Offset Property Topography and Water Resources



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Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Chicken sheds
- Poultry shed access track
- Offset Areas
- Contours (5m)

Water Resources

- Major Watercourse
- Creeks and Drainage Features
- Dams
- Reservoirs

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 100 200 300 400 500 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:17,000 @ A3

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SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A39 Offset Topography Water F

6.4 MNES Habitat Suitability

Analysis of threatened species records and regional ecosystem mapping across the offset site and surrounding area presents positive data on the potential for the region to provide significant conservation benefit to MNES listed species.

6.4.1 Koala

Within the offset property, vegetated areas contain a dominant mix of locally important koala tree species as listed in Table 35 of the ANU A review of Koala Habitat Assessment Criteria and Methods (8.17 South East QLD, Table 35, Page 58). The ROA 3 is mostly devoid of vegetation with the exception of scattered large trees within the north-eastern extent and a patch of regrowth vegetation within the southern extent. A combination of existing Koala records from ALA database (refer **Plan A40**), evidence of Koala usage via SAT surveys and recorded presence of the species utilising vegetation within the offset property provide strong confidence in the value of the proposed restoration of ROA 3 for the Koala. Although the offset area itself contains limited vegetation and therefore limited Koala habitat, there is State KHA mapped directly south of ROA 3 (refer **Figure A15**). Both of these vegetation patches are contained within a proposed offset area for a separate EPBC project. Ultimately, improving vegetation coverage and species diversity, and reducing potential threats within ROA 3 as a part of this project is highly conducive to improving habitat for Koala within the region. Restoring vegetation within this area improve Koala movement opportunities and provide a wider area of foraging and breeding habitat.

Further supporting evidence for the site to contain a high potential to support this species is pre-clear mapping (refer **Figure A16**) and actual on-site vegetation communities surrounding ROA 3. The Rosevale Offset Property contains a broad distribution of the following regional ecosystem types (code plus dominant Species), which are dominated by Koala habitat and foraging trees:

12.3.3 – *Eucalyptus tereticornis, Eucalyptus crebra, Eucalyptus moluccana*
12.8.17 – *Eucalyptus melanophloia, Eucalyptus crebra, Eucalyptus tereticornis, Corymbia intermedia*
12.8.16 – *Eucalyptus melliodora, Eucalyptus crebra, Eucalyptus tereticornis*
12.8.14 – *Eucalyptus eugenioides, Eucalyptus biturbinata, Eucalyptus melliodora*

The majority of ROA 3 contains Category X (non-remnant) vegetation due to the historical and current land use for cropping and grazing activities. However, pre-clear mapping indicates that Endangered RE 12.3.3 and Least Concern RE 12.8.17 were previously mapped across the area (refer **Figure A16**). In addition, a small patch of Category C (regrowth) vegetation described as least concern RE 12.8.17/12.8.14 is located within the south-eastern corner of the ROA 3 site. The rehabilitation and restoration activities proposed with this project will implement vegetation from these regional ecosystems.

6.4.2 Grey-headed Flying-fox

Underlined flora species in the above regional ecosystems are additionally listed as significant food plants for the Grey-headed Flying-fox (Eby & Law 2008). Although ROA 3 contains limited vegetation with exception to some scattered trees in the north-eastern extent and a patch of regrowth in the southern extent, the surrounding landscape contains over 500 ha of foraging vegetation for the species. Therefore, improvement

of ROA 3 via management measures proposed with this project, re-planting, stock management, pest control and removal of internal barbwire fences where stock has been removed, has the potential to increase safe foraging habitat for Grey-headed Flying Fox (GHFF) and protect it in perpetuity. This species is known to the region, with GHFF recorded foraging within vegetation associated with the approved Aroona Offset Site (EPBC 2016/7817), which is 5 km north of ROA 3. Furthermore, the Rosevale offset property is located approximately 14 km from the Mount French GHFF roosting camp [288], 31 km from the Laidley Plainlands Roost [372] and 36km from the Kooralbyn roost [551] (refer **Plan A41**).

Records under the National Flying Fox web viewer vary with the most recent surveys confirmed at the Kooralbyn and Laidley site. All the sites, excluding Laidley, which is under Ipswich City Council jurisdiction, are listed as active under the Scenic Rim Regional Council Flying-Fox Management Strategy 2023-2028 (SRRC, 2023a). The DCCEEW species profile and threats database for GHFF indicates that this species is capable of nightly flights of up to 50 km from their roost to forage in a variety of different feeding areas. Therefore, the surrounding roosts are all within a reasonable distance from the offset area that it is likely GHFF would forage within the current foraging habitat present surrounding ROA 3.

6.4.3 Swift Parrot

Swift Parrots are usually seen in small parties of up to 30 birds, or occasionally in flagger flocks (of several hundred birds) around sources of abundant food. Swift Parrots breed in Tasmania and then move to mainland Australia in Autumn for the non-breeding season. They feed preferentially in the largest trees available (Kennedy and Overs, 2001) and on psyllid lerps, seeds and fruit (Kennedy and Tzaros, 2005). Commonly used lerp infested trees include Inland Grey Box (*E. macrocarpa*), Grey Box (*E. moluccana*), Blackbutt (*E. pilularis*), and Yellow Box (*E. melliodora*). Preferred foraging tree species include winter flowering species such as Swamp Mahogany (Eucalyptus robusta), Spotted Gum (*Corymbia maculata* or *C.* citriodora), Red Bloodwood (*C. gummifera*), Forest Red Gum (*E. tereticornis*), Mugga Ironbark (*E. sideroxylon*), and White Box (*E. albens*) (DCCEEW, 2024).

A review of State vegetation mapping indicates that the pre-clear Regional Ecosystems mapped for the Offset Area include commonly used foraging species for the Swift Parrot, including *Eucalyptus tereticornis* and *E. melliodora*. Due to historical clearing for agriculture activities, mature eucalypts are currently sparse within the Category X (non-remnant) vegetation areas located within the offset area.

No Swift Parrot populations or individuals have been recorded within 10 km of the offset area. A search of ALA database using a 10 km search radius from the offset area returned no records for the species, however, there are several records for the species within 40 km buffer. A regional habitat analysis combining potential habitat and records of this species is shown on **Plan A42**.

Field surveys identified one preferred foraging species, *Eucalyptus tereticornis* (Forest Red Gum) scattered within the current open paddock offset area. Given the proposed reconstruction of Regional Ecosystems that support foraging species, and the highly mobile nature of the winter foraging Swift Parrot with records in the vicinity, the proposed offset is considered suitable to support the matter.

6.4.4 Regent Honeyeater

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 and the Australian Capital Territory, to central Victoria. Records are widely distributed across its range, however, is only found regularly at a few localities in NSW and Victoria where most of the sightings have been recorded. There are four known key breeding areas, three in New South Wales and one in Victoria.

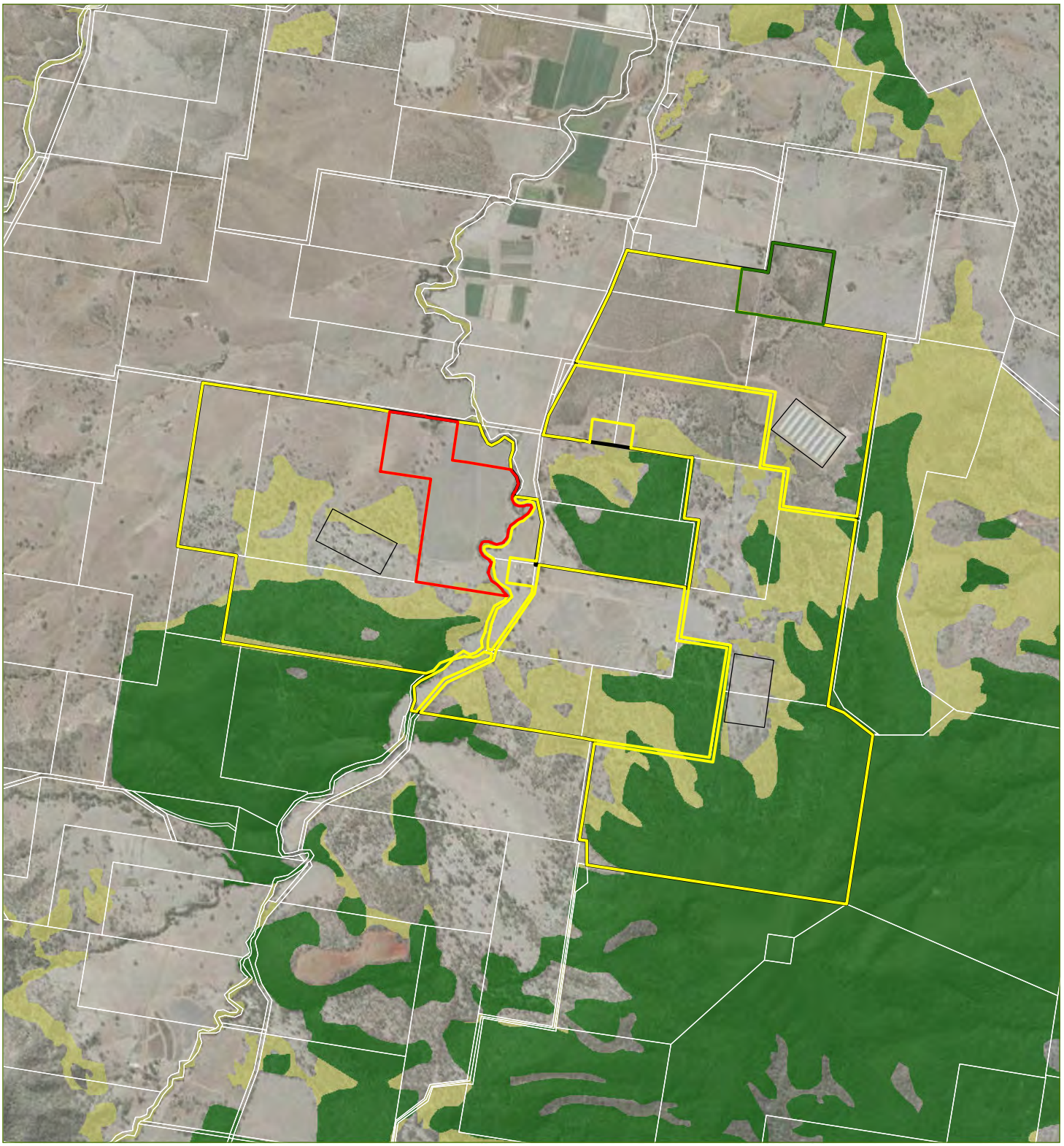
The species mostly inhabits inland slopes of the Great Dividing Range, in areas of low to moderate relief with moist, fertile soils. It is most commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest, but also inhabits riparian vegetation such as sheoak (*Casuarina* sp.) where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

Like other species of honeyeater, the Regent Honeyeater utilises a variety of food resources. Its 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. Nectar is obtained chiefly from eucalypts and mistletoe, and Regent Honeyeaters appear reliant on select species which provide reliable nectar flows. Regent Honeyeaters prefer taller and larger diameter trees for foraging, as these typically produce more nectar (Franklin et al., 1989; Webster & Menkhorst 1992; Menkhorst et al., 1999; Oliver 2000). Preferred foraging tree species for the Regent Honeyeater include *Eucalyptus sideroxylon, Eucalyptus melliodora, Eucalyptus albens, Eucalyptus leucoxylon, Corymbia maculata/citriodora, Eucalyptus robusta*. Mistletoe species important for foraging include *Amyema cambagei, A. miquelii* and *Dendropthoe vitellina*.

A review of State vegetation mapping indicates that the pre-clear Regional Ecosystems mapped for the Offset Area include eucalypt foraging species that could be utilised by the Regent Honeyeater. Due to historical clearing for agriculture activities, mature eucalypts are currently sparse within the Category X (non-remnant) vegetation areas located within the offset area.

No Regent Honeyeater populations or individuals have been recorded within 10 km of the offset area. A search of the ALA database using a 10 km search radius from the offset area returned no records for the species, however, there are records for the species within 40 km of the offset area indicating broader foraging patterns. A regional habitat analysis combining potential habitat and records of this species is provided on **Plan A43**.

Given the proposed reconstruction of Regional Ecosystems that support foraging species, and the highly mobile nature of the winter foraging Regent Honeyeater with records in the vicinity, the proposed offset is considered suitable to support the matter.



Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Poultry Sheds
- Offset Properties

Koala Habitat Areas

- Core Remnant Koala Habitat Areas
- Core Regrowth Koala Habitat Areas

Figure A15

Qld Koala Habitat Areas

Springfield City Group Pty Ltd

File ref. 7399 E Figure A15 Offset KHA F
Date *18/08/2026*
Project *Peninsula Precinct*

0 200 400 600 800 1,000 *m*

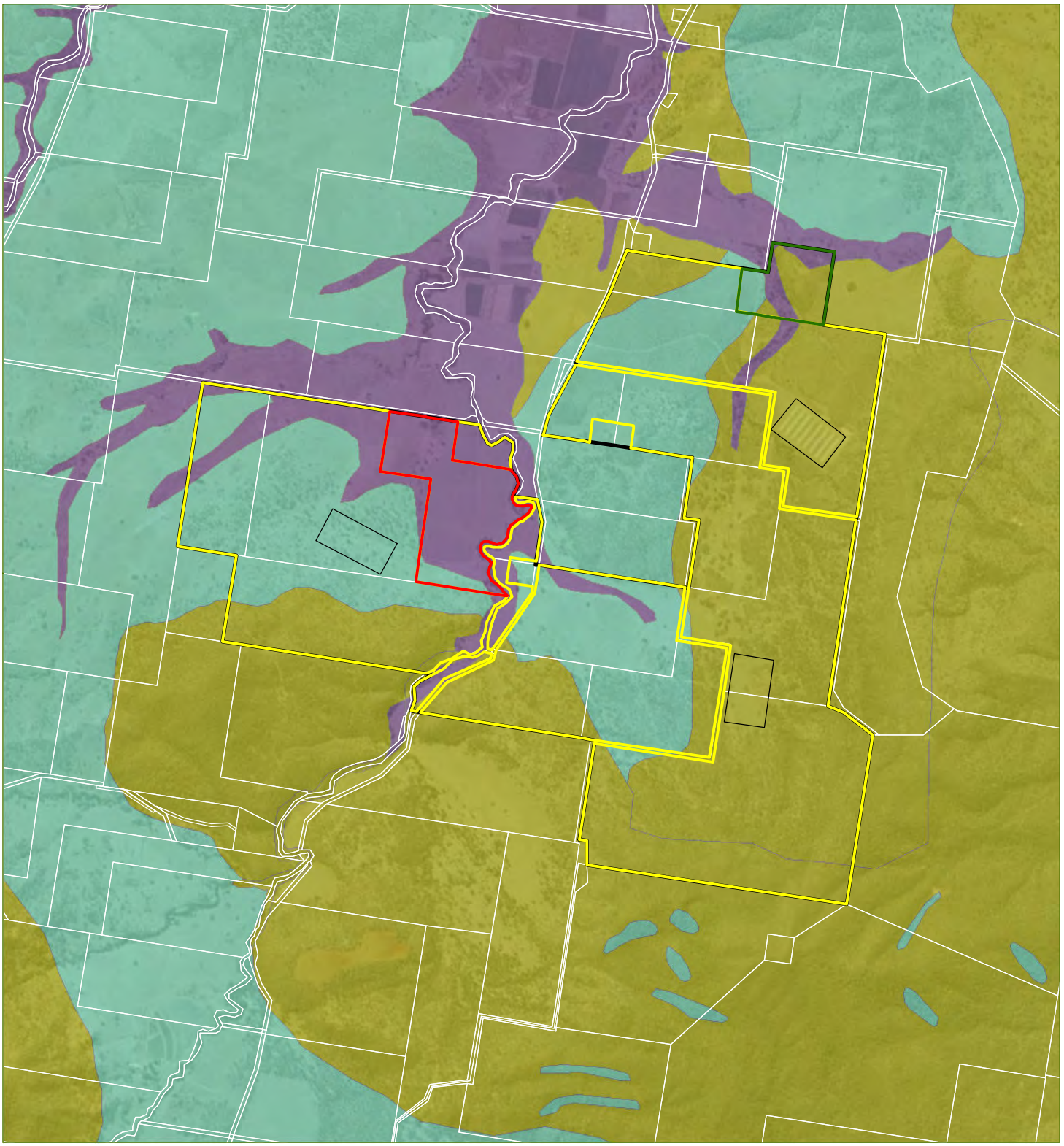
Scale (A4): 1:30,000 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland 2021



Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Poultry Sheds
- Offset Properties

Biodiversity Status (Pre-Clear Regional Ecosystems)

- Endangered
- Of Concern
- Not of Concern

Figure A16

Qld Pre-Clear Vegetation and Biodiversity Status Mapping

Springfield City Group Pty Ltd

File ref. 7399 E Figure A16 PreClear F
Date *18/08/2026*
Project *Peninsula Precinct*

0 200 400 600 800 1,000 *m*

Scale (A4): 1:30,000 [GDA 1994 MGA Z56]

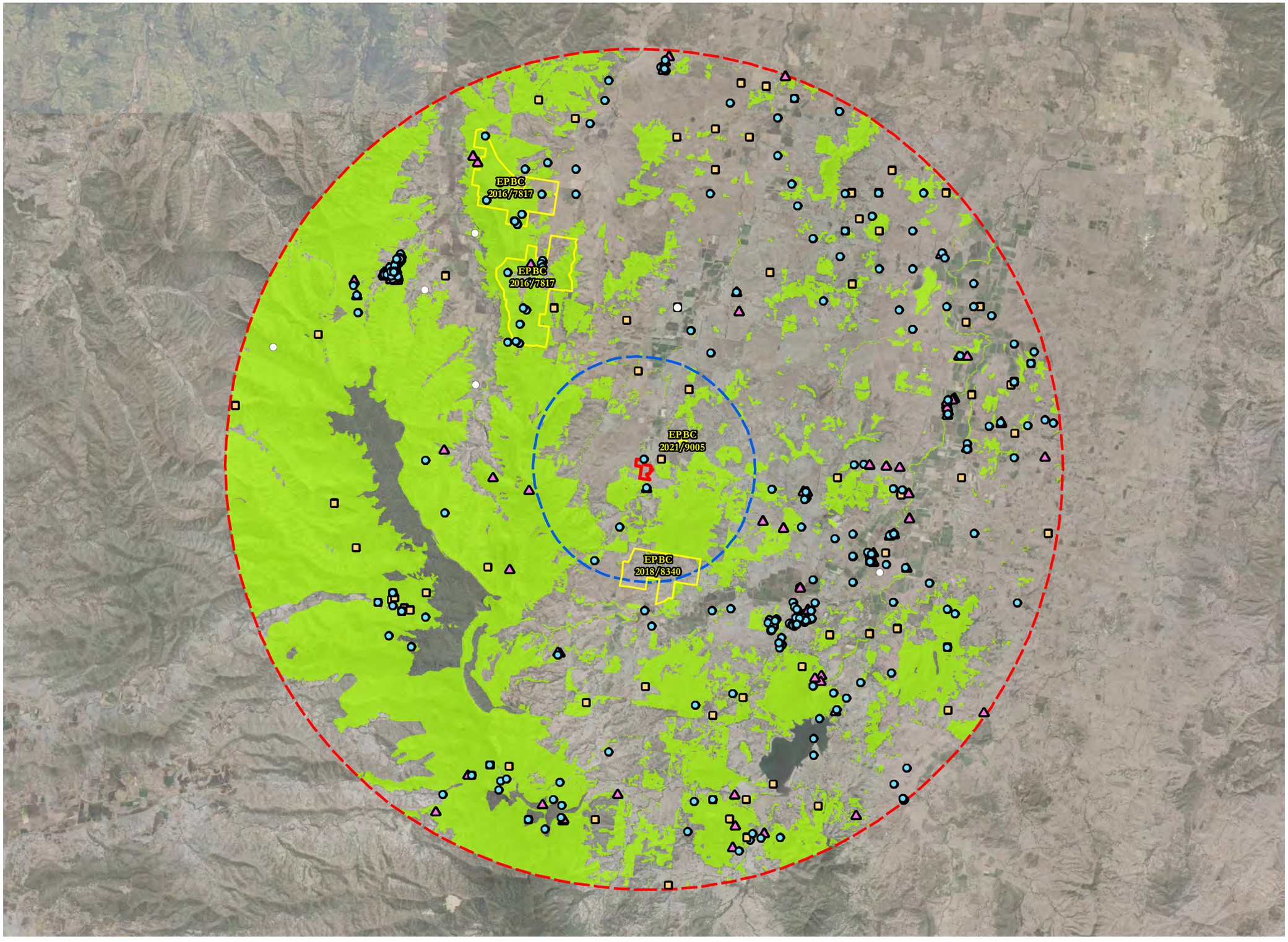
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A40. Offset Property Koala Regional Context Assessment



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Legend

- Offset Area
- 5km Offset Area Buffer
- 20km Offset Area Buffer
- Existing Approved Koala Offset
- Potential Koala habitat within 20km of Offset Area [42.4%]

Koala Records within 20km of Site (ALA, 2025)

- Koala (*Phascolarctos cinereus*) Records within 20km of Offset Area recorded within the last 5 years - 187
- Koala (*Phascolarctos cinereus*) Records within 20km of Offset Area recorded between 5 and 20 years ago - 350
- Koala (*Phascolarctos cinereus*) Records within 20km of Offset Area recorded without a sighting date - 33
- Koala (*Phascolarctos cinereus*) Records within 20km of Offset Area recorded over 20 years ago - 88

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 1 2 3 4 5 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:185,000 @ A3

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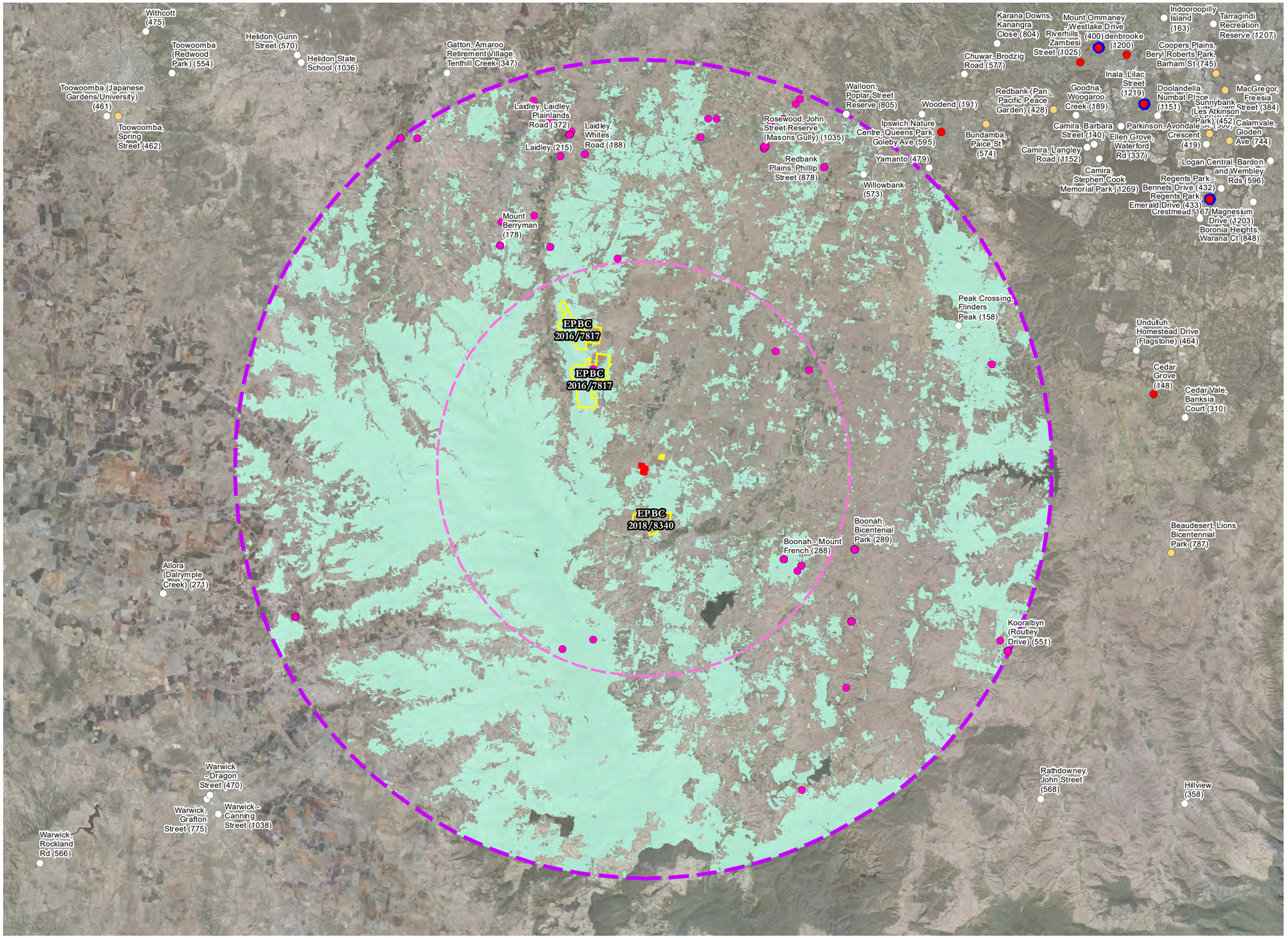
SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A40 Offset Koala Regional Context F

A41. Offset Site Grey-headed Flying-fox Regional Context Assessment



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Legend

- Offset Area
- Offset Area 20km Buffer
- Offset Area 40km Buffer
- Existing Approved Grey-headed Flying-fox Offset
- Offset Area 40km buffer area - Potential and Known Grey-headed Flying-fox Foraging Habitat [43%]
- Grey-headed Flying-fox records within 40km of offset area - 124

National Flying-fox Monitoring (Fed Gov. 2024.)

- Grey-headed Flying-fox roost inactive within recent surveys [9 within 40km of offset area]
- Grey-headed Flying-fox roost active within recent surveys [2 within 40km of offset area]
- Grey-headed Flying-fox roost active within recent surveys with a population level of 3 or above [1 within 40km of offset area]
- Nationally significant Grey-headed Flying-fox roost active within recent surveys [0 within 40km of offset area]
- Nationally significant Grey-headed Flying-fox roost active within recent surveys with a population level of 3 or above [0 within 40km of offset area]

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 2 4 6 8 10 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:375,000 @ A3

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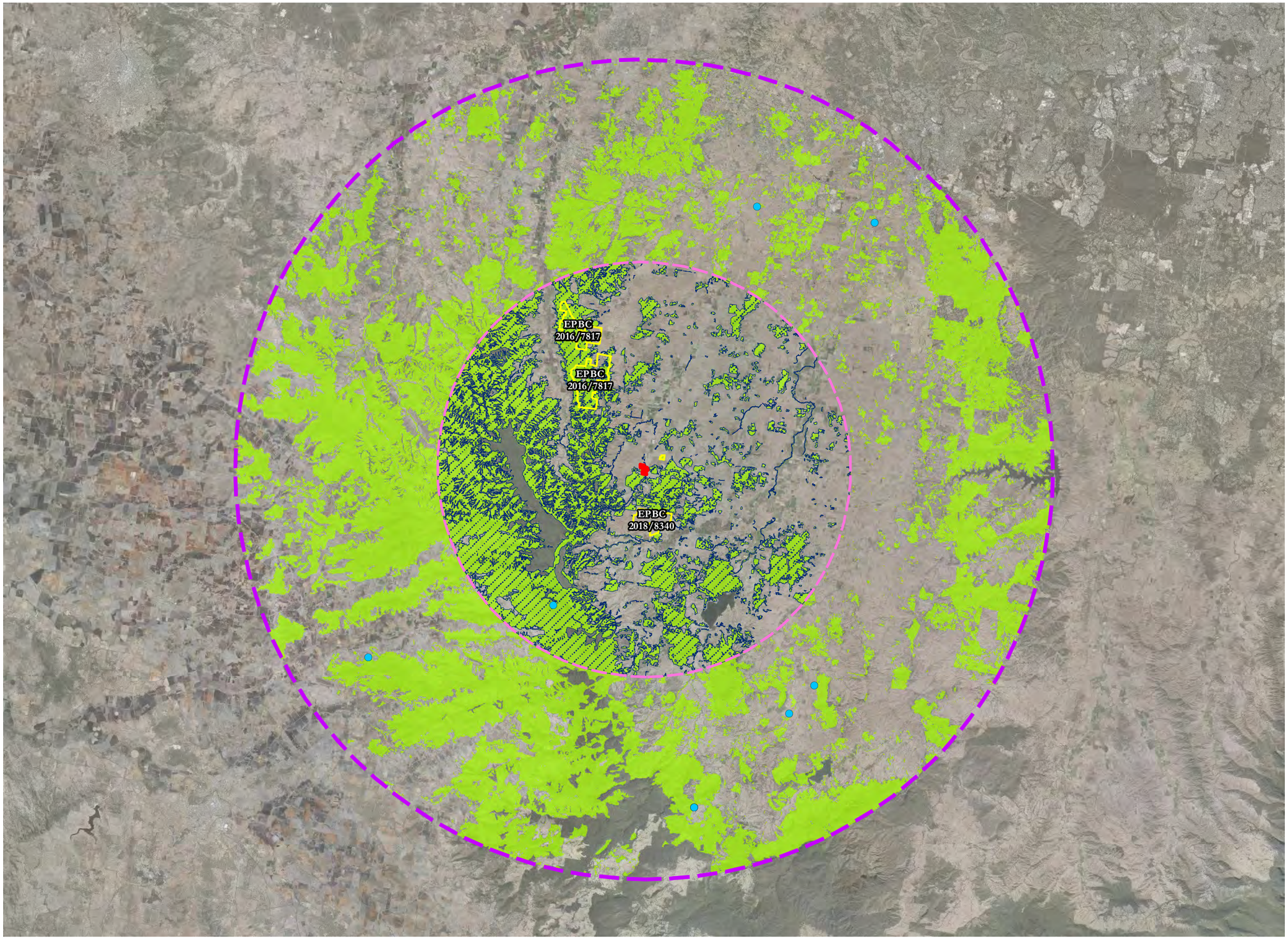
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Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A41 Offset GHFF Regional Context F

A42. Offset Property Swift Parrot Regional Context Assessment



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Legend

- Offset Area
- Offset Area 20km Buffer
- Offset Area 40km Buffer
- Existing Approved Swift Parrot Offset
- Potential and known Swift Parrot foraging habitat within 20km of Offset Area [39.5%]
- Potential and known Swift Parrot foraging habitat within 40km of Offset Area
- Swift Parrot records within 40km of offset area [8]
  Note: Records are generalised on a grid system for protection of the species.

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 2 4 6 8 10 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:375,000 @ A3

Address / RPD: 163/SP291400

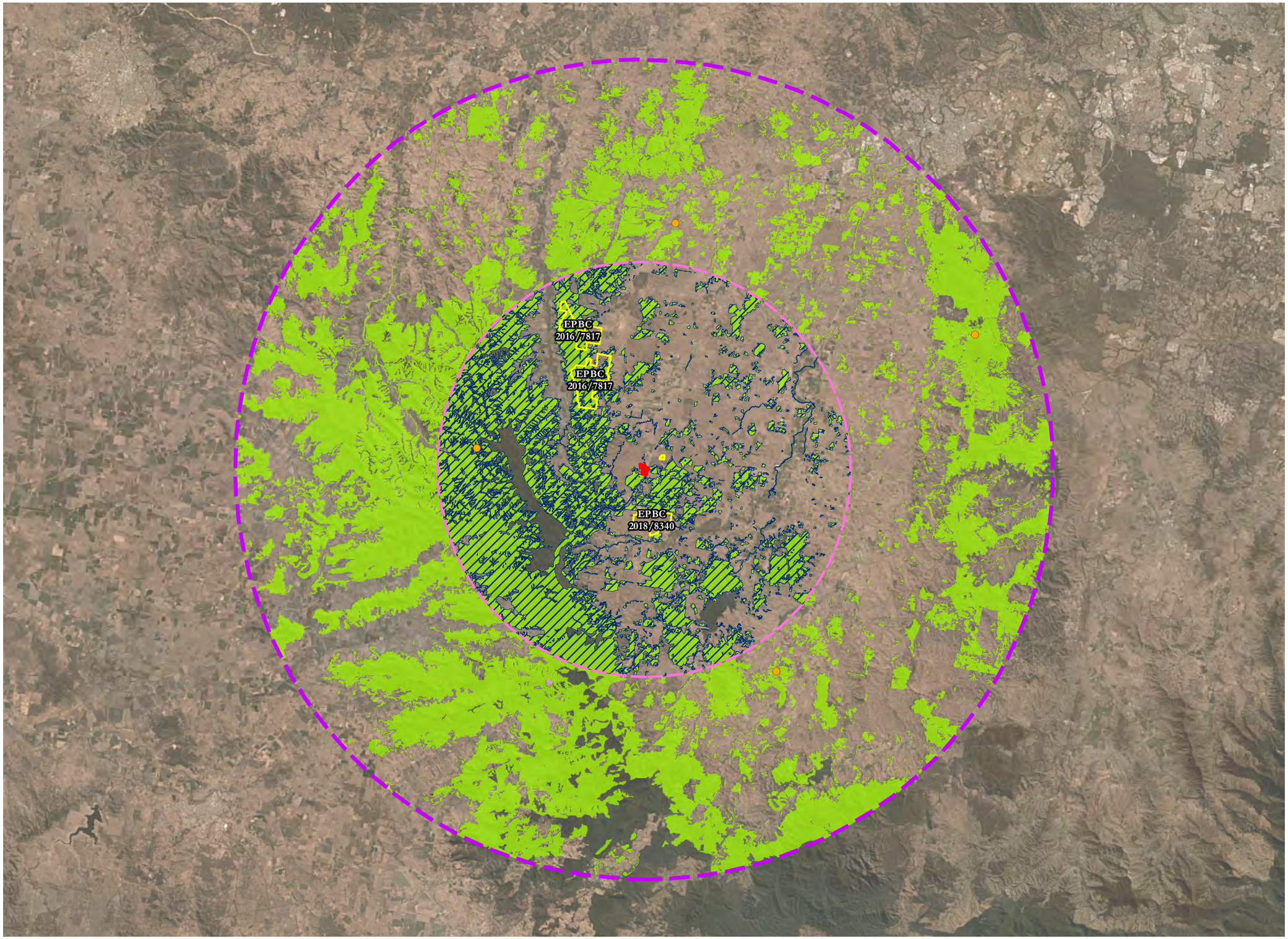
18/08/2026 | 7399 E A42 Offset SP Regional Context F

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Peninsula Precinct

A43. Offset Property Regent Honeyeater Regional Context Assessment



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Legend

- Offset Area
- Offset Area 20km Buffer
- Offset Area 40km Buffer
- Existing Approved Regent Honeyeater Offset
- Potential and known Regent Honeyeater foraging habitat within 20km of Offset Area [39.5%]
- Potential and known Regent Honeyeater foraging habitat within 40km of Offset Area
- Regent Honeyeater records within 40km of offset area [5]
  Note: Records are generalised on a grid system for protection of the species.

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 2 4 6 8 10 km

Transverse Mercator | GDA 1994 | Zone 56 | 1:375,000 @ A3

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Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A43 Offset RH Regional Context F

6.5 General Suitability EPBC Offset Policy Criteria

The objective of this OMP is to outline appropriate management actions which achieve the offset outcomes specified within the EPBC Act and provide an overall improved conservation outcome and net gain in Koala habitat and GHFF foraging habitat and thereby ensuring the long-term viability of the Koala, GHFF, Swift Parrot and Regent Honeyeater populations.

The implementation of the OMP (refer **Attachment A9**) will enhance habitat for Koala, GHFF, Swift Parrot and Regent Honeyeater through improvements to vegetation, reduction and key threats and provision of shelter and safe movement opportunity. **Table A58** lists the principles of the EPBC Act Environmental Offsets Policy and describes how the proposed offset strategy has been developed to adhere to these principles.

Table A58: Compliance with EPBC Act Environmental Offsets Policy Principles

Principle	Offset Strategy Compliance
Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action	The offset area delivers a conservation gain for the Koala, GHFF, Swift Parrot and Regent Honeyeater through the creation of 37.9 ha of new habitat and reconstruction/assisted natural regeneration of 3.4 ha of sparse regrowth vegetation. a) The revegetation zone proposed for the ROA 3 includes 37.9 ha of area located on the alluvial rich soils and MNES assisted rehabilitation within 3.4 ha of existing regrowth vegetation. The land is currently seeded for the growth of hay grass during season and directly grazed outside of harvest. b) Trees adjoining to the south include preferred Koala and GHFF species and contains State mapped Koala Habitat Area. Additionally, trees within the north along the Moorang Lane road reserve are dominated by large *Eucalyptus tereticornis* which are preferred foraging species for the Swift Parrot. c) Koala scat has been consistently found in the trees in the road reserve to the north, in vegetation to the south and along the Bremer River to the north and west showing all surrounding areas are used by the species. Further, where vegetation occurs over the wider Rosevale property Koalas have been observed. d) The area proposed for revegetation is mapped as RE12.3.3, RE 12.8.17 and RE12.8.14 described as mixed woodland dominated by eucalypt species on Cainozoic igneous rocks. Dominant trees species within these ecosystems contain preferred foraging trees for the Koala, Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater. e) Averting the direct and indirect losses via declaring the land a Voluntary Declaration area for High Value Conservation under the Queensland *Vegetation Management Act 1999* will remove current cropping and grazing practices and prevent incompatible land uses. f) In isolation, the 41.3 ha replanting zone will connect the Moorang Lane road reserve trees to the regrowth koala habitat to the south within the site. The location of ROA 3 adjacent to several EPBC offset

Principle	Offset Strategy Compliance
	properties will create a major habitat node along the Bremer River which presently only retains a narrow strand of vegetation on either bank. g) As part of the balance offset the land holding contributes nearly 800 ha in conservation land containing large tracts of cleared land which will connect and improve areas of regrowth and remnant vegetation with the Bremer River and major surrounding tracts of bushland which ultimately connect with the Main Range Nation Park.
be built around direct offsets but may include other compensatory measures	The offset area includes legally securing the land area and undertaking necessary management to complete revegetation in a cleared paddock and assisted rehabilitation of regrowth areas to achieve 111.63% of the offset required for Koala impacts and 148.72% of the offset for Grey-headed Flying-fox. The combined impact and offset assessment for Springfield City Group's EPBC 2020/8629 (Peninsula Precinct) and EPBC 2020/8651 (Scenic Precinct) for the Swift Parrot and Regent Honeyeater will achieve 101.54% of offset requirements for Regent Honeyeater and 154.30% of offset requirements for the Swift Parrot. Planting obligations will be delivered across both the ROA 3 (Peninsula Precinct) and adjoining ROA 4 (Scenic Precinct) and will be delivered concurrently to achieve the proposed offset outcomes. A minimum of 100% of the offset required is built around direct offsets.
be in proportion to the level of statutory protection that applies to the protected matter	Within this application the Koala and the GHFF are assessed as Vulnerable. Under the International Union for Conservation of Nature (IUCN) data the probability of annual extinction is 0.2 %. The Swift Parrot and Regent Honeyeater are assessed as Critically Endangered with an annual extinction probability of 6.8 %. This factor applies through the meta data of the Offset Guide assessment calculation sheets for which each species has been assessed as achieving greater than 100% offset through the proposed offset area (**Attachment A9 – Appendix B**).
be of a size and scale proportionate to the residual impacts on the protected matter	Direct and indirect impacts for the protected matters have been calculated at the impacts site using the Modified Habitat Quality Assessment (MHQA) for the Koala and the Foraging Habitat Assessment (FHA) methods for Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater. Within the OAG the Quantum Impact for each species is listed as: • Koala (11.34 QI ha) • Grey-headed Flying-fox (11.34 QI ha) • Swift Parrot (3339 habitat features impacted at Peninsula and 1755 features at Scenic for combined offset assessment)

Principle	Offset Strategy Compliance
	• Regent Honeyeater (2756 habitat features impacted at Peninsula and 1891 features at Scenic for combined offset assessment) To achieve the offset required for these impacts, the offset area provides a direct land-based outcome over 41.3 ha entirely through habitat recreation activities on historically cleared land devoid of native vegetation. The percentage of the impacts acquitted through this offset is: • Koala – 111.63 % • Grey-headed Flying-fox – 148.72 % • Swift Parrot – 154.30 % • Regent Honeyeater – 101.54 %
effectively account for and manage the risks of the offset not succeeding	The offset area forms part of the balance land of a much larger offset strategy covering nearly 800 ha of land. At this scale resourcing required to deliver, maintain and manage the risks is significantly increased compared to smaller offsets area. This OMP identifies 7 key risks / threats to some, or all, of the offset principles and outcomes not being achieved. These are: • Wildfire • Drought • Shifting habitat range • Plant stock failure • Feral animal control • Weeds of National Environmental Significance (WONS) increasing, and • Livestock control, access and trespass management Each of these risks have influenced the specific management actions proposed in the relevant assessment units where the risk may occur and more importantly the monitoring, measuring of success and adaptive management for the offset succeeding. Further, the offset provider intends to engage third party, suitably qualified professional(s) to ensure that the management outcomes of the offset land are achieved and risk of the offset not succeeding is mitigated. Repetitive monitoring and survey replication is to be a feature of the OMP to ensure adaptive management changes are made as soon as identified and throughout the life of the offset. In addition to completion criteria, interim milestones will be developed for each management measure.
be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs	The Peninsula Precinct project occurs in the Springfield Structure Plan area declared by the State Government as a priority area for development. There are few environmental controls at the impacts site with the

Principle	Offset Strategy Compliance
	Queensland Government's *Environmental Offset Act 2014* not being applicable. There are no guidelines or controls around offset or rehabilitation for the Grey-headed Flying-fox, Koala, Swift Parrot and Regent Honeyeater. The offset area is currently utilised for various rural activities and is not protected or managed for conservation purposes. The southern allotments of the offset property fall within the mapped extent of *Regional Biodiversity Corridor 101 described as Kangaroo Mountain to Rosewood Corridor: Extends from Kangaroo Mountain* (Main Range National Park) through to Mt Walker and Rosewood. Regional (5 km). All habitat protection and habitat creation is supported by this strategic intent and importantly the land is not located within an area at threat of new development expansion, new road or rail upgrades or extractive resource uses. Similarly, Moorang Wildlife Corridor, south of the offset property, forms a direct connection to the vegetation within the offset site. As of October 2022, *Scenic Rim Regional Council* committed to a 50 percent increase in funding for their Environmental Grants Program. This budget increase benefits community groups and landholders that are working towards enhancing the Scenic Rims natural environment, preserving habitat for rare and threatened species and improving the quality of Scenic Rim waterways. This is inclusive of landholders who are working to reduce/eliminate wild pigs spreading weed seeds and eroding riparian areas in the Moorang area. However, this is not required by law and is instead encouragement to improve land values across the region. Considering the majority of the properties surrounding the offset area are used for cropping and agriculture and how large, time consuming and expensive a task managing revegetated areas can be, it is considered entirely beneficial that 41.3 ha of land be offset under this project. Therefore, without the triggering of the EPBC Act and subsequent requirement to obtain approval, the offset as proposed in the OMP is not required for any of the protected matters under State or Local legislation. Additionally, the offset area would not be protected in perpetuity for conservation purposes.
be efficient, effective, timely, transparent, scientifically	Through conditions of approval the offset area will be legally secured prior to the commencement of any clearing on the impact site. Following EPBC Act approval, the offset area and its value (as finalised through the EPBC Act Approval) will be legally secured through a Voluntary Declaration (VDEC) declared under the Queensland Government's *Vegetation Management Act 1999*. A VDEC protects land and values and is binding on future owners. The declaration and management plan will be noted on the

Principle	Offset Strategy Compliance
	land title, which informs prospective buyers of current declarations and management plans and where copies are available. This information is important to the property market as future owners will be bound by the plan and declaration. The legally securing of the land will be made through declaring the area as having High Nature Conservation Values. The VDEC will be lodged and legally secured by evidence of encumbrance on Registered Land Title prior to the commencement of any clearing works on the Impact Site. Following the VDEC. The offset area will be permanently secured via a legal mechanism that is approved by the Land Holder and the Department. Draft terms of the permanent legal mechanism to be submitted for approval within 18 months of commencement of the action. Within 12 months of approval of the draft terms the offset site must be permanently secured. The OMP schedules a list of existing or specifically designed scientific methodologies for the measuring of base line and improved outcomes for the protected matters. Detailed baseline studies have been occurring over the approved offset areas and are used to inform the outcomes of this version of the OMP. The OMP also requires the use of tertiary trained and experienced experts along with appropriately certified and experienced contractors for the implementation of a host of actions.
have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	The offset property is owned by a large rural enterprise who has a variety of rural activities occurring on-site. The third party offset provider will fund all actions listed as approved in an offset management plan. An executed legal contract (Offset Provider Deed) is in place outlining the legal and committed relationship of the funding and delivery of the offset outcomes. Clearly articulated goals are set within this OMP for each proposed action within each Assessment Unit or Environmental Management Zone. Collectively, these goals link directly to the achievement of the overall conservation gain for the protected matters as designed, assessed and calculated through the selection and delivery of the offset. The management actions and implementation schedule to be included in the offset management plan are designed to be measured, monitored, audited and enforced year upon year during the life of the offset.

6.6 Offset Property Current Management Activities

Presently, the Rosevale offset property as a whole is utilised for poultry farming, hardwood plantation, cattle grazing and cropping. A description of the current management arrangements is included below.

Refer to **Plan A44** which identifies the location of the current management arrangements.

Hardwood Plantation

The offset property contains approximately 110 ha of land which has historically been utilised for hardwood plantation. The hardwood plantation consisted of native eucalypt species, which were planted in 2009, and then harvested and sold for commercial uses. The hardwood plantation management arrangement is a popular use in the surrounding area. The most recent hardwood plantation was impacted during a property maintenance burn which damaged the plantation stock, and it was unable to be harvested for commercial purposes. The financial incentive of hardwood plantation surrounding the poultry farming operations deems this a viable land management arrangement.

Cattle Grazing

The rural designation, undulating landscape and historically cleared open paddocks of the offset property provide for suitable cattle grazing practices. The offset property has cattle carrying capacity of approximately 300 head of cattle. The cattle grazing management arrangement compliments the poultry farming and hardwood plantation land uses, with no loss in cattle grazing capacity. The cattle grazing management practices occurs over the entirety of the Rosevale offset property.

Cropping

Part of the western offset property parcel (Lot 1 / CC3571) which is bound by the Bremer River on the eastern property boundary contains suitable land type and topography to facilitate agricultural cropping. Given the accessibility to water (Bremer River) and compatibility for cropping uses, the flat land on Lot 1 / CC 3571 is suitable for an intensive management action, which compliments other compatible land uses on the offset property. The ability to undertake agricultural cropping on the offset property allows the landholder to provide feed for or fatten the cattle on-site. Cropping activities which overlap with the ROA 3 offset will be discontinued once approved and management activities begin.

Poultry Farming

Presently, the Rosevale Offset Property retains existing poultry farming operations which have been occurring on the offset property since 2018. The poultry farming operations consist of 8 commercial broiler sheds with a capacity of approximately 360,00 birds and are 1.6 km north-east of the proposed ROA 3 offset. Furthermore, a Development Application has been approved for an additional 8 sheds (360,00 birds) which will be constructed in the next 2 years, one of which is planned directly east of ROA 3. For the existing poultry farm access roads are currently present and future proposed access is proposed to the approved poultry farms. These are considered a part of current management actions due to the increase of anthropogenic activity and vehicle movement within these areas. This current management arrangement results in an intensive agricultural function on a large portion of land, which is retained and utilised for other compatible uses.

Under the Department of Fisheries *Development of Meat Chicken Farms in Queensland* 2016, "fixed setback distances" are established and maintained between the meat chicken farm and sensitive land uses. However, sensitive land uses referred to in this act are defined as community facilities, accommodation and dwellings, not environmental areas (Queensland Planning Provision version 4.0 July 2014). This DAF document also indicates that these "are included largely to permit a simple, conservative evaluation of required buffer distances" and highlights the need for site-specific evaluation of setbacks in relation to sensitive land uses. Site-specific separation distances are heavily based on the dispersion of odours from their source. Regardless, a 100 m buffer area from the poultry farms to the offset site is provided to minimise the impacts of human activity, odour, dust, noise and light on intended offset areas conservation values.

The current Rosevale Property Offset Site land holdings contain an existing operational poultry farm with 2 additional facilities approved and proposed over the area, none of which are within the boundaries of ROA 3. However, one of the new facilities is proposed approximately 300 m east of the offset area for the Peninsula Project. Despite already approving environmental offsets for Matters of National Environmental Significance (MNES – Koala) at the Rosevale Offset Site on the 2nd of November 2022 (EPBC 2021-9005) and an another offset for Koala, GHFF and Greater Glider in 2022, 2.6 km south of the Rosevale Offset property (EPBC 2018/8340), the Department has subsequently raised concerns around the potential incompatible dual use of the land holding for a poultry operation and environmental offsets.

No detailed commentary has been provided to support the specific incompatibility concerns, however based on the information collected and considered in this OMP no overt conflicts or impacts have been identified which out weight or impair the conservation gain opportunities the property provides. Currently the 52.3 ha of ROA 3 contains very limited canopy coverage and therefore safe fauna movement is largely absent where Koala would likely have to traverse the ground to move between foraging. With the implementation of the management actions in this Offset Management Plan, safe fauna movement would be reinstated across the area which limits the threats from Wild Dogs as Koala could move throughout the trees.

Importantly its noted that at no stage were offsets proposed over any areas with existing or proposed infrastructure supporting the poultry operation. The Rosevale Offset land holdings covers approximately 800ha of land spread over 16 registered allotments. From the northern boundary to the southern boundary the land covers 3.5km and measures 3.6km east to west. The existing poultry farm infrastructure at the site, including sheds, tanks, office, storage, access tracks, diversion swales and basins covers a maximum area of 8.75ha or a little over 1% of the site. Allowing for the remaining facilities to be completed and including existing farmhouses, pump stations, cattle yards and sheds the total portion of the land utilised by infrastructure would be less than 27ha or approximately 3.7% of the total land area. None of this land has been proposed for use within any approved or lodge offset proposal.

The balance of the land is currently used for cropping on the flat lightly undulating creek plain zones and cattle grazing throughout. Both of these uses will cease with approval and commencement of offset actions where they overlap with the proposed offset area.

Poultry Farm Mitigation of Potential Impacts

During office and onsite discussions concerns raised by the Department around incompatible land uses focused more on potential indirect impacts of poultry farm operations, relating to:

1. Access and Traffic and Machinery Management
2. Noise
3. Light
4. Surface & Stormwater Management
5. Odour

The Poultry Industry and any approved facilities are extensively regulated by the *National Environmental Management System for the Meat Chicken Industry – Version 2*, in relation to legal requirements, natural resources and amenity, operation, design and management and monitoring, recording and reviewing. The Processors Grower's Manual, the RSPCA Meat Chicken Farming Scheme Standard and the RSPCA Operation Manual which these facilities adhere to, outline standard operational procedures that drive the necessary completion of a Site Based Environmental Management Plan (SBEMP), which covers the above potential impacts and management in detail.

Each of these potential indirect threats or incompatible land use activity are discussed in relation to impacts on MNES along with a number of other offset design amendments. Refer to **Table A59**.

It is noted that in South East Queensland the poultry operations are specifically considered as a preferred land use for the preservation of biodiversity values because of the small footprint of the activity. One of the original Queensland Government koala protection legislation tools – *State Planning Policy 1/97 – Conservation of Koalas in the Koala Coast* states the following under compatible land uses:

Compatible development

5.7 Development proposals would be compatible with conserving koala habitat values if all the following criteria are met:

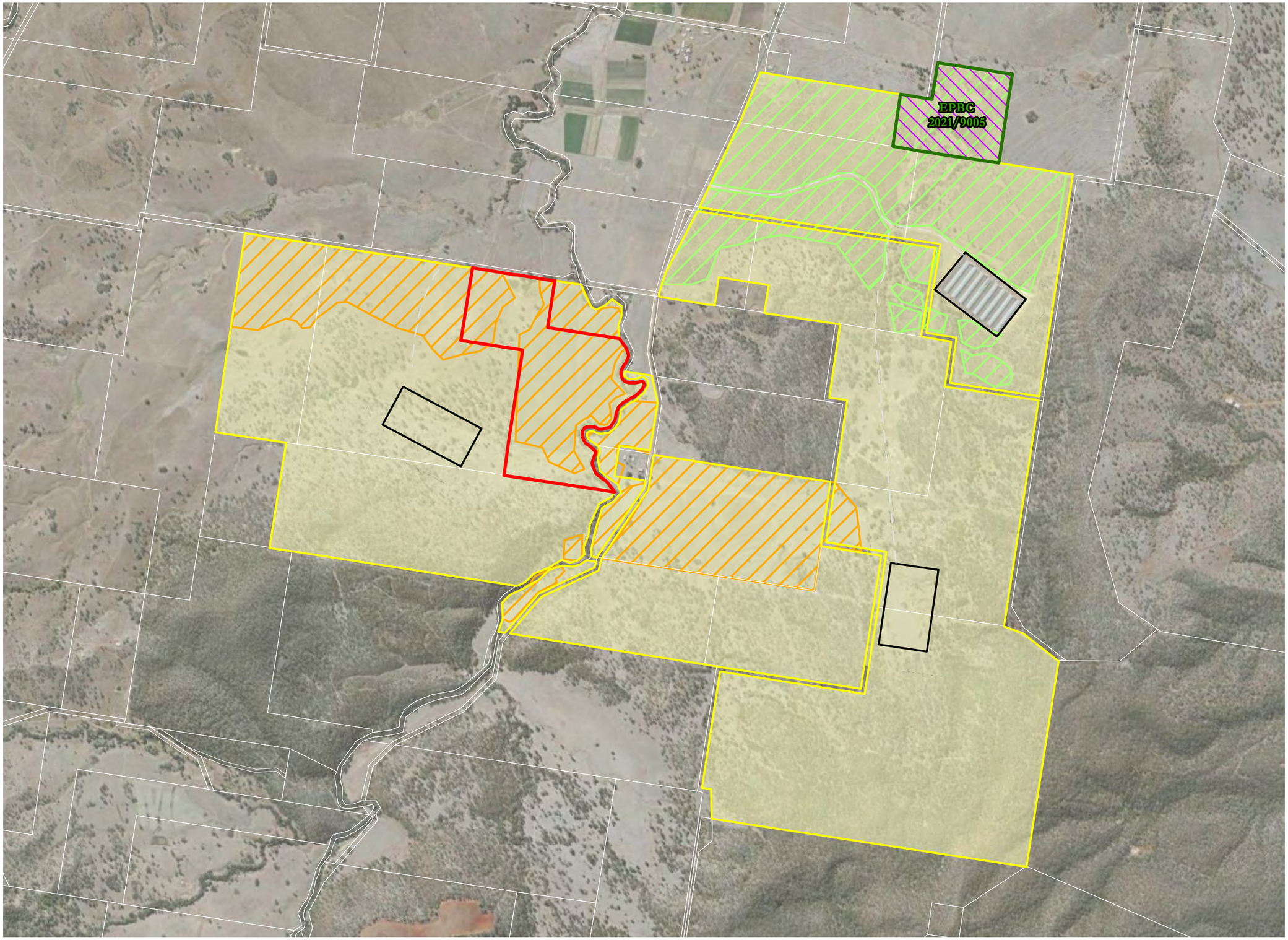
- *little or no clearing of habitat would be required;*
- *for sites in the Koala Conservation Area, minimal additional night-time traffic movements would be generated on the road network in the Koala Conservation Area;*
- *any impedance or threats to the movement of koalas through or across the site would be minimised;*
- *there would be no other significant detrimental environmental impacts on the koala habitat values in the surrounding area; and*
- *koala habitat values would be substantially maintained or enhanced.*

5.8 The Koala Coast's proximity to a large urban population and major tourist destinations should provide opportunities for a range of activities that can be designed in ways that are consistent with the above criteria and conserve the environmental qualities of the area. Some examples are small-scale individual manufacturing, distribution or storage enterprises; home-based businesses; and 'nature-based' recreation/tourism facilities and activities (including those enabling people to experience koalas in their natural habitat). Intensive poultry farming is an example of agricultural development which, if properly planned and managed, is able to meet these criteria. Similar agri-businesses might also be appropriate.

(SPP 1/97 – Page 6 – Underlining added)

The result of State Planning policy 1/97 sees large clusters of poultry operations located amongst core koala habitat in the Redlands and Logan areas. No evidence or research has been documented that these areas have a higher degree of wild dog and fox populations due to these activities, however koala records have been observed to remain high at these locations.

A44. Offset Property Current Management Activities



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 Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources

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Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Cattle Grazing
- Pest and Weed Management Activities
- Historical Hardwood Plantation Area
- Historical Cropping Area

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 100 200 300 400 500 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:17,000 @ A3

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A44 Offset Current Management F

saunders havill group

SPRINGFIELD CITY GROUP

Peninsula Precinct

Table A59: Potential Impacts on MNES Associated with Current and Future Poultry Sheds

Potential Impact	Justification and Mitigation Measures	Threat to MNES
Noise	For broiler facilities which utilise fully enclosed and sealed sheds noise is not a known impact as part of the operation as birds cannot be heard external to the facilities they are housed. The performance, behaviour and growth of the birds is highly sensitive to noise and a number of mechanical inclusions and methods are deployed to muffle motors and fans, including the use of acoustic enclosures. Some noise would be expected during the construction of the remaining shed facilities; however, this is a quick and temporary process. Once operational remaining noise generating activities relate to vehicle movements, loading and unloading and maintenance of machinery, which are all very intermittent and not beyond those occurring on adjacent properties with cattle yards and transport. Intermittingly the low hum of the ventilation fans occurs in direct response to temperature conditions and can only be heard at or downwind of the fan locations when they are running. **Matters of National Environmental Significance and evidence of MNES usage has been consistently located on-site, specifically koala scat recorded in vegetation adjacent to the existing shed facilities. Noise is not considered to impair offset use of the land, particularly with the inclusion of the 100 m setback to offset activities.**	Low
Light	The poultry farm, hours of operation are 7am until 6pm and the facility is not staffed overnight. Not permanent external lighting occurs or is proposed. On remote occasions when there is an issue or staff commence early or work late vehicle lights will occur on the track, however this is rare and not considered additional to undertaking nighttime ecological surveys. **No aspects of the operations lighting will influence any outcomes or usage of the offset for MNES.**	Low
Surface and Stormwater	The risks associated with surface and stormwater for poultry operations links to nitrogen and phosphorus contamination directly for the shed pad moving to run off to sensitive environments. Although both of these chemicals occur naturally in vegetated areas and waterways excessive quantities can lead to impacts resulting in native plant dieback and algae populations in waterways. Surface and Stormwater fun off in the poultry industry is governed by the QLD Environmental Protection policy (Water and Wetland Biodiversity) 2019 which stipulates the following minimum parameters: • No worsening of stormwater discharges into downstream properties • No worsening of flood plain extents • No increased risk of contamination of downstream receiving waters	Low

Potential Impact	Justification and Mitigation Measures	Threat to MNES
	Additionally, the Scenic Rim Regional Council Planning Scheme regulates the poultry use through the codes and policies. Both regulations result in a number of internal and external controls. Internal controls include: • Concrete nib walls surrounding the base of the sheds to prevent run off entering the shed areas and to contain water within. • Used bedding or litter is removed from the site • During shed wash downs no water is discharged from the shed area – temperature controls and ventilation fans are used to evaporate the water. Externally the shed areas are located away from waterways and contain permitter diversion drains to prevent run-off into the shed areas. Rainwater felling directly within the shed area is directed through a treatment drain made up of: • Grassed swales in between each shed area, directed to: • Vegetated filters strips at either end of the swale areas, discharging to • Detention basins sized to capture retain and treat on-site run off **An extensive water quality monitoring program is mandated by the regulations to ensure not net increase in pollutants occurs beyond the detention basin system. All of these facilities occur immediately surround the shed infrastructure meaning a further 100m set back is applied to any offset activities**	
Odour	The poultry industry has long been associated as a major producer of odour pollution, primarily in connection with the impact this has on neighbouring homes, users and other sensitive receptors. Historically odour sources within the poultry industry was attributed to: • Decomposition of manure often mixed with bedding and debris (usually occurs when wet) • Poorly stored and spoiled feed supplies • Dead animal removal and storage Significant advancement and controls now apply to major poultry operations which remove or minimise these odour producing activities. Poultry sheds located on the Rosevale site are fully insulated, temperature-controlled facilities. Every aspect of the operation is regulated.	Low

Potential Impact	Justification and Mitigation Measures	Threat to MNES
	Odour caused through the decomposition of manure mixed with bedding is created when water is added resulting in an ammonia smell (known as 'wet litter'). This outcome is neither good for surrounding nuisance odour levels nor healthy for the birds and thus a raft of innovations and management protocols exist to remove and limit this outcome, including: • Sealed, controlled and ventilated sheds preclude impacts of rain or high moisture content increasing the humidity within the shed facility maintaining the optimal conditions to keep bedding areas dry. • Daily inspections occur to ensure the temperature and humidity are maintained the bedding areas are tilled and replaced. Litter is maintained in a dry and friable condition. • Spent litter is disposed off-site via covered trucks. • Feed is stored directly within the sealed ventilation sheds. • Dead birds are collected daily in all sheds. Dead birds must be removed and located in a cold room where they are stored in sealed containers prior to contractor off site removal (minimum twice weekly). Of particular concern during discussions with the Department appeared to be the potential for the odour emanating from the poultry sheds to additionally attract wild dogs and foxes, known threats to the Koala. This risk is noted for free range chickens which are directly exposed to the threat, however there is not easily identifiable research linking evidence of this same threat occurring for insulated and contained broiler sheds.	
Attraction of Pest Species (in particular Wild Dogs)	Wild dogs are known to the site and broader areas, like most rural locations in South-East Queensland. Wild dogs have been recorded at the offset property including over 3km away from the existing shed facilities. They are also known to the Audale Offset site 2km to the south and the Aroona Station Offset site 4.5km to the north-west. Based on preliminary assessment of Wild Dogs and other pest species within the Offset Property via infrared fauna cameras across 3 separate survey periods (April – May, May – August and August – November), only nine (9) Wild Dogs were recorded over 778 camera nights by a total of 14 cameras (refer **Appendix A8 Section 5, pp. 113** for Baseline Pest Surveys). Based on the relative abundance index (RAI) the total abundance of wild dogs within the Rosevale Offset Property is 1.16. The relative number of sightings across the survey time is not considered to suggest there are significantly more Wild Dogs within the area as a result of poultry farming activity. This is particularly true when compared to the pest species results from the Aroona Offset Site (EPBC 2016/7818) annual compliance reporting. This offset site is 5 km north of the Rosevale Offset Property and does not have poultry farming within or adjacent to the approved area. Regardless, prior to management of the area, abundance of dogs across the	Low

Potential Impact	Justification and Mitigation Measures	Threat to MNES
	offset area was recorded at 3 in 2019, 10 in 2020 and 8 in 2021. These numbers are similar to the recordings on-site despite no poultry farming being present. Therefore, it can be inferred that the presence of the poultry farms has not increased wild dog presence. Similarly, only 2 foxes were recorded within the Rosevale Offset Property during baseline surveys. This is again similar to or less than the recorded numbers at the approved Aroona Offset which recorded 2 in 2019, 3 in 2020 and 6 in 2021. Furthermore, poultry farms biosecurity measures and pest control are often based around disease control and controlling rodents with fencing and specialised shed design keeping out unwanted pest species. Much of the literature surrounding Wild Dogs refers to their impacts on sheep, cattle and goats rather than poultry farming as there is a lot more opportunity for predation on these animals than on chickens contained in sheds. Additionally, Wild dogs and European Fox are known throughout the region regardless of the presence of agricultural farming as they also predate on other invasive species; European Hare, Feral Pig as well as native mammals; Kangaroos, Wallabies, Bandicoots, etc. European Fox in particular are opportunistic feeders and therefore are not particular in the areas they choose to live. Both of these species widely known to be a threat to livestock and native fauna, hence their inclusion in the *Biosecurity Act 2014* and *Scenic Rim Regional Council Declared Pest Animals or Weeds*. In 2022 Scenic Rim Regional Council identified a spike in Wild Dog populations around national parks, particularly within the Canungra locality where large areas for breeding are present (Sheehan and Forbes, 2022). These areas are identified as being an epicentre for Wild Dog populations as there tends to be no formal control programs in place as these are often associated with agricultural activities. Cattle farming surrounding the proposed offset property, although not by law required to control Wild Dogs, European Fox, Feral Pigs, etc., outside of General Biosecurity Obligations outlined in the *Biosecurity Act*, likely undertake their own pest control procedures. Additionally in mid-April 2023, SRRC introduced the 1080 baiting programme to assist owners of larger land holdings in managing pest animals and guides landowners through the legislative requirements of baiting (SRRC, 2023). Although again not under law to do so, the programmes roll out will benefit those at the centre of agricultural production as they make easier to gain access to control methods and ultimately have been proposed to work best when neighbouring properties are in co-ordination. Therefore, the encouragement of agricultural landholders in the region to control pests benefits the Rosevale Offset Property and the proposed efforts associated with the ROA 3 offset. **There is no significant evidence following baseline pest surveys that the current poultry sheds have increased the presence of Wild Dogs or European Foxes. This is particularly true when compared to other Offset Site data that do not**	

Potential Impact	Justification and Mitigation Measures	Threat to MNES
	contain poultry sheds. These Offset Sites record similar or in some cases more pest abundance than what was observed within the Rosevale Offset Property. The proposed pest management measures, including a detailed Pest Management Program associated with the OMP is considered to be sufficient in reducing the potential threat of feral animals that may threaten MNES species within ROA 3.	

6.7 Offset Area Current Threats

The offset property contains a variation in agricultural uses and land types from existing remnant vegetation through to open cropping land. Several flora and fauna species observed directly or indirectly (scats, prints, etc) within the Offset Property are listed under the *Biosecurity Act 2014*, Schedule 2 Part 2 as a restricted matter – invasive biosecurity matter as well as Scenic Rim Regional Council declared pest animals or weeds. Several of the identified restricted species form the basis of management requirements due to their direct impact to MNES listed species or indirect impact to the habitat required to support these species.

The Scenic Rim Regional Council also lists Feral Goats (*Capra hircus*) and Fire Ants (*Solenopsis Invicta*) as declared pest animals, with neither of these identified as occurring on-site. Should their presence be detected in future surveys then they will be adopted into the pest management plan, which is designed with adaptive management measures for flexibility. Fire Ants in particular have strict biosecurity measures required to stop their spread, with sightings needing to be immediately reported to Biosecurity Queensland.

Wild dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) are considered direct threats to the MNES target species (refer **Table A60**). This conclusion is based on several federal government documents including:

- DAWE Conservation Advice for *Phascolarctos cinereus* (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory
- National Wild Dog Action Plan 2020 – 2030

Medium priority threats to Koala and Grey-headed Flying Fox include Feral Cat (*Felix catus*) and European Fox (*Vulpes vulpes*). These species are not listed as a key threatening process to either of the MNES species however both are known to be opportunistic predators with significant impacts to native species.

It is also acknowledged that although they aren't listed as a direct threatening process to the target MNES species for the Project, Feral Pig (*Sus scrofa*) are opportunistic omnivores and will consume a wide range of animals including small mammals and birds. Feral Pigs are also widely known to cause significant environmental destruction to soil and vegetation via digging, spreading weeds and consumption, particularly surrounding waterbodies. Therefore, the presence of Feral Pigs within the offset site cause destruction of current habitat value and water resources, and indirectly impacting essential habitat areas for the listed MNES. This is similarly the case for Feral Rusa Deer (*Cervus timorensis*) which are known to damage native vegetation, spread weed seeds and foul water and European Rabbit (*Oryctilagus cuniculus*) which impact native vegetation.

Other identified specific threats within the ROA 3 include:

- Ploughing and re-harvesting the land for hay
- Cattle grazing
- Due to the use of the offset area as largely cropping land, it is not immediately impacted by significant weed infestations. Regardless, many invasive species, in particular *Lantana camara*, a declared restricted matter under the *Biosecurity Act 2014* and SRRC, occur all around the offset area

and more broadly over the Offset Property. Once the cropping use is completed and native vegetation is established across ROA 3, it is anticipated weed sources will be an ongoing challenge with the offset area. Therefore, weed management has been thoroughly addressed.

Table A60: Offset area major threat to MNES

MNES Offset Target Species	Major threats to MNES present within offset property
Koala (*Phascolarctos cinereus*)	• Encounter mortality from dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) • *Lantana camara* adversely affects the ability of Koalas to move between trees • Habitat clearing and degradation of habitat
Grey-headed Flying-fox (*Pteropus poliocephalus*)	• Barbed wire fencing (entanglement) • Habitat clearing and degradation of habitat
Swift Parrot (*Lathamus discolor*)	• Predation by feral cats (*Felis catus*) and European Fox (*Vulpes vulpes*) • Habitat clearing and degradation of habitat
Regent Honeyeater (*Anthochaera phrygia*)	• The primary threats to the Regent Honeyeater relate to the species' small population size, habitat loss and fragmentation, competition, and degradation of remnant habitat. However, given that feral cats are opportunistic hunters it is likely they are also a threat to Regent Honeyeater. • Habitat clearing and degradation of habitat

6.8 Rosevale Offset Area 4 Management Actions

There are six (6) management actions identified within the associated Offset Management Plan as relevant and necessary for the ROA 3 to achieve outcomes which will benefit the impacted MNES and/or their potential foraging habitat for Koala, GHFF, Swift Parrot and Regent Honeyeater. The management actions focus on the creation of habitat for the impacted protected matters, while also reducing threats. Although there may be overlap between some of the management actions, all management actions are considered to contribute to the improvement of MNES habitat at the offset area and over the broader site.

Management actions have been proposed with consideration of the National recovery plan for the Koala *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DAWE, 2022) and National recovery plan for the Grey-headed Flying-fox *Pteropus poliocephalus* (DAWE, 2021), National Recovery Plan for the Regent Honeyeater (*Anthochaera phrygia*) (DoE, 2016) and National Recovery Plan for the Swift Parrot *Lathamus discolor* (2024). Additionally, relevant threat abatement plans (for predation by European red fox and predation by feral cats), site-specific desktop and field assessments and numerous peer-reviewed papers and studies relevant to the relevant threatened species has been utilized to inform the proposed management actions.

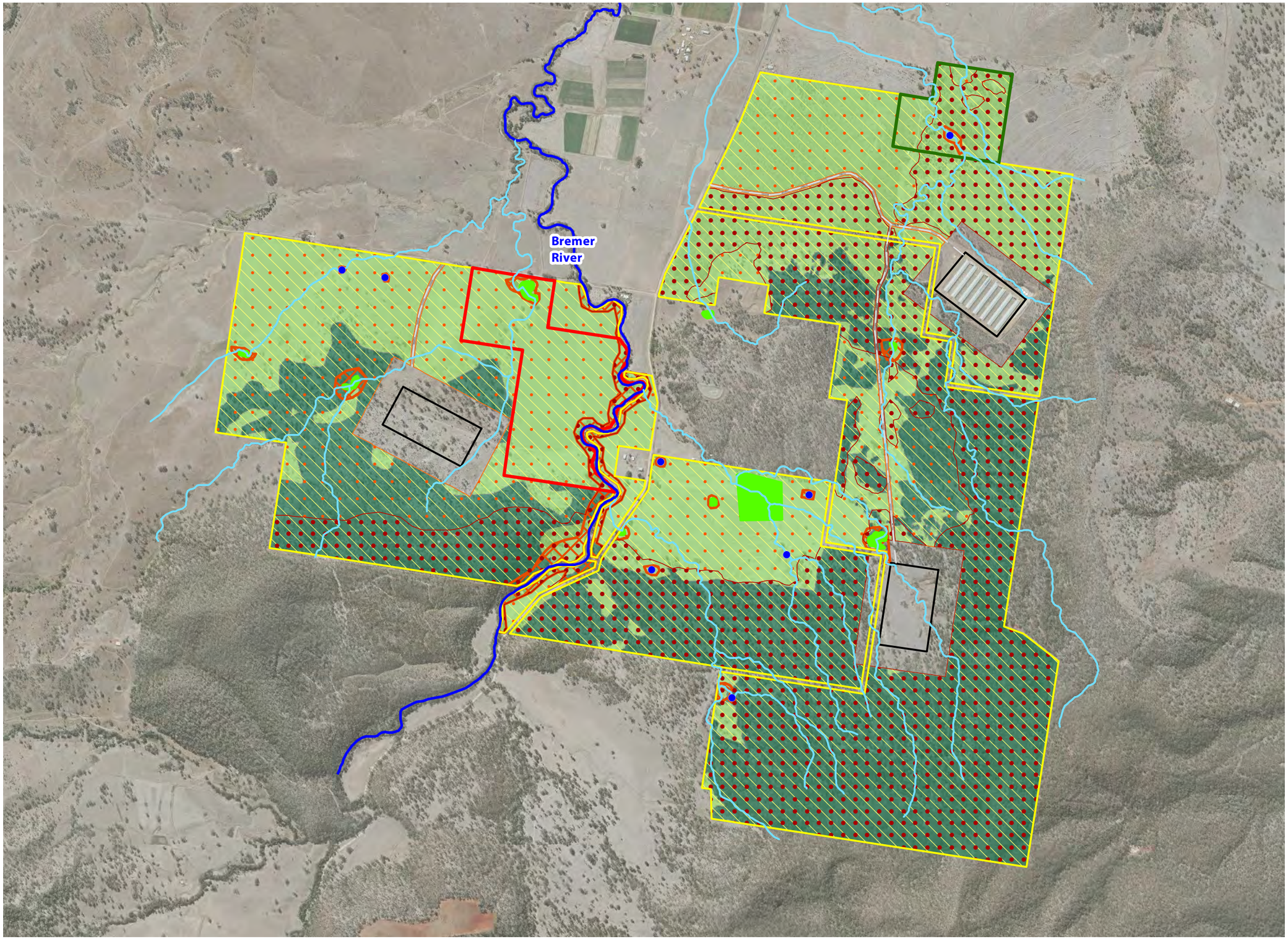
Actions to be completed in accordance with the OMP include:

- **Management Action 1:** Feral Animal Control (primarily targeting Wild Dogs)
- **Management Action 2:** Weeds of National Significance Control (prevention and management)
- **Management Action 3:** Stock Management and Cropping Discontinuation
- **Management Action 4:** Access and Trespass Management
- **Management Action 5:** MNES Habitat Restoration
- **Management Action 6:** Bushfire Management

Refer to **Plan A45** for indicative location of management actions.

The Offset Management Plan (refer **Attachment A9**) adopts a number of 'adaptive management' procedures both as a governing principle and within specific management activities which are described in Section 7 of the OMP. Most management activity table topics incorporate detailed baseline survey and data collection to be periodically repeated through the offset period and utilised for iterative changes to management implementation, particularly for stochastic habitat risks and threats.

A45. Offset Area Preliminary Indicative Map of Proposed Management Actions



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 Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

Layer Sources

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Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Chicken sheds
- Poultry shed access track

Water Resources

- Major Watercourse
- Creeks and Drainage Features
- Dams
- Reservoirs

Proposed Management Areas

- Feral Animal Control - Focal
- Feral Animal Control - General
- General Weed Management
- Significant Weed Management
- MNES Habitat Assisted Rehabilitation
- MNES Habitat Restoration

Issue	Date	Description	Drawn	Checked
A	22/04/2021	Preliminary	LS	AW
F	18/08/2026	Amendments	HW	AW

0 100 200 300 400 500 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:17,000 @ A3

saunders havill group

SPRINGFIELD CITY GROUP

Peninsula Precinct

Address / RPD: 163/SP291400

18/08/2026 | 7399 E A45 Offset Proposed Management F

7. Economic and Social Matters

This section responds to Item 7 of the PD request which requests further details on economic and social matters, including:

a. ***Provide details on the social and economic costs and / or benefits of undertaking the proposed action, including the basis for any estimates of costs and / or benefits. Where possible, please include the total economic capital investment and economic ongoing value of the project.***

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

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

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

Greater Springfield is Australia's newest city and is already the business heart of the high-growth Western Corridor. The Springfield CBD, occupying some 390 ha, will provide an employment base for 30,000 workers within an area of 1.4 million m^2 of office, retail, educational, health and technology facilities.

The $1.2 billion Springfield Rail project officially opened at the end of 2013.

The Peninsula Precinct proposal is an essential component of the Greater Springfield development because it houses the part of the essential population needed to make the investment in infrastructure etc. in the corridor viable.

To date there has been substantial investment in Greater Springfield (these figures are overall investment in the corridor):

- Project Investment to date - ~$12 billion
- Estimated cost on completion - $23 billion
- Project completion to date - approximately 20%
- Total land area - 2,860 hectares
- CBD land area (Springfield Central) – 390 hectares (963 acres) or twice the land area of Brisbane CBD
- Approval for over 1.4 million square metres of mixed use space in the CBD
- Access to 86% of Brisbane's metropolitan workforce in a 32 minute drive
- Population of over 560,000 within a 22 minute drive of the CBD
- Commitment by State Government to deliver two train stations (Springfield Central and Springfield Lakes) by 2013
- Planned 2030 equivalent population - 105,000 residents (comparable to Darwin)
- Job creation target for 2030 - 30,000 (one for every three residents)

7.1 Social and Economic Benefits

The Ipswich region has been recognised as a crucial 'growth area' in South East Queensland for both economic development and population growth. The population of Ipswich is expected to double from 170,000 to 435,000 by 2026, creating a demand for a further 120,000 jobs within the Ipswich area. The development and construction industry plays an important role within the local economy by supporting local retailers and employing local skilled and unskilled labour. Long term investment in new housing and facilities, like that offspring Mountain, will provide vital opportunities for local firms and suppliers and help build the City's skill base in building and construction by maximising local employment during the construction of Spring Mountain

On completion, the Peninsula Precinct will create long term economic benefits for local retailers as demand for goods and services within the Greater Springfield area increase. In addition, commercial and retail opportunities as well as education opportunities will be available within Peninsula Precinct creating more long-term employment opportunities for local residents, including local youth.

7.2 Stakeholder engagement and consultation activities

The overarching Springfield Structure Plan was adopted as part of the *Ipswich Planning Scheme 2006* and was subject to extensive public consultation during its design phase in accordance with the *Integrated Planning Act 1997*. The development intent of Greater Springfield has incorporated public opinions and addressed public concerns.

7.3 Cultural Heritage Considerations

As part of the Greater Springfield development, consultation was undertaken with indigenous stakeholders and cultural heritage experts. On 25 June 1999, a Cultural Heritage Conservation Plan (CHCP) for the Springfield Structure Plan was approved by the former State Government Environmental Protection Agency. The Concept Cultural Heritage Plan is provided as **Attachment A10**.

The CHCP identifies known or potential areas of Aboriginal cultural heritage sensitivity across the Springfield development area and establishes overarching management expectations for development with the purpose of assisting proponents in informing preliminary risk assessments and avoiding obviously sensitive areas during planning and design. The CHCP is recognised as a supporting planning and management document, but it does not replace or override obligations under the Aboriginal Cultural Heritage Act 2003 (ACHA).

The EPA categorised the artefact sites as:

- Not requiring further attention;
- Adequately protected; or
- Requiring additional protection.

Under the approved Cultural Heritage Plan site E is located adjacent to the Scenic Precinct which is deemed to be in the "adequately protected" category, remaining within the public open space designation.

As noted above, a 'duty of care' in relation to Aboriginal culture heritage is established by the ACHA. The proponent will be responsible for enacting their 'duty of care' obligation under the Aboriginal Cultural Heritage Duty of Care Guidelines (Queensland) such as through incorporating cultural heritage awareness into site inductions and establishing clear "stop work" procedures in the event that artefacts or potential cultural heritage material are encountered.

It is noted the 'duty of care' obligation is also present in Section 10.2.3 of the SSP which states "A person must not remove, destroy or interfere with any identified cultural heritage resource of either aboriginal or European origin or item of the Queensland Estate" confirming the requirement that cultural heritage is to be identified and appropriately managed.

8. Ecological Sustainable Development

This section responds to Item 7 of the PD Request which asks the proponent to: "***provide a description of how the proposed action meets the principles of ecologically sustainable development as defined in Section 3A of the EPBC Act.***"

The *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) has a key objective to '*promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resource,*' (EPBC Act section 3). Ecologically Sustainable Development (ESD) is defined within the Commonwealth Government's National Strategy for Ecologically Sustainable Development as *'using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future, can be increased*'.

The goal of the National Strategy for Ecologically Sustainable Development is:

> *Development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends.*

The core objectives include:

1. To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
2. To provide for equity within and between generations; and
3. To protect biological diversity and maintain essential ecological processes and life-support systems

These objectives are accompanied by seven guiding principles of ESD.

Table A61: ESD Principles

ESD Core Objectives
1. To enhance individual and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations
The project will benefit individuals and the community as a whole by providing a wide range of housing options, employment opportunities and recreational activities. The construction and operation of the project will enhance the local and regional economy and in turn the Greater Springfield Area. The project has been designed to provide a visual amenity that is appealing and promotes a sense of community, while facilitating active lifestyles by providing cycle paths and footpaths. Ecological values have been taken into account during the design of the project, with areas containing significant ecological values or functions protected within conservation and open space areas. The project will safeguard the needs of future generations.
2. To provide for equity within and between generations

ESD Core Objectives

The project will safeguard the needs of future generations while meeting the demands of current generations. Management measures will be imposed to avoid and mitigate potential impacts, while an offset will compensate for the residual impacts on critical habitat. This will ensure that the habitat which is lost will be recreated to achieve no net loss of critical habitat for the Koala, GHFF, Swift Parrot and Regent Honeyeater. The development has taken into account the diverse needs of the community by proposing a range of housing types and densities. This will ensure that appropriate housing is available to current and future generations.

3. To protect biological diversity and maintain essential ecological processes and life-support systems

The site has been subject to environmental surveys and reporting. The ecological values of the site have been identified and recorded. While the project will impact on 18.9 hectares of critical habitat for the Koala, GHFF, Swift Parrot and Regent Honeyeater and the dedication of 41.3 hectares of land for environmental offsets will ensure that biological diversity is maintained in the local area and ecological processes will be maintained.

ESD Guiding Principles

1. Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations

The design of the project has taken both long-term and short-term economic, environmental, social and equitable considerations into account. High level regional planning has been considered for the development of Greater Springfield, including its proximity to existing infrastructure including highways and rail, which provides efficient transport routes for community members. Access to transport will allow commuters to reach Brisbane, Logan and Gold Coast business districts for employment. In addition, the project site is in proximity to existing residential development and the Springfield Town Centre which will provide residential, commercial and educational development.

A variety of housing types and densities will be made available, ensuring that a diverse range of people will have access to appropriate housing that suits their particular needs. Open space areas in the form of recreational parks will be made available throughout the project area, ensuring equitable access of open space areas to all community members.

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

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

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

Impacts to the Koala and associated habitat have been identified as the primary environmental concern on a level of National Environmental Significance. The site's utilisation by MNES and its ability to provide critical habitat for MNES has been discussed in detail throughout this report. The site has been recognised to support low level Koala activity and an area of 18.9 hectares has been identified as containing habitat critical to the survival of the Koala, GHFF, Swift Parrot and Regent Honeyeater.

A number of possible impacts have been identified as a result of the project; however these are all 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. A number of management measures will be imposed to avoid and mitigate these impacts as

ESD Core Objectives
detailed within the VCFMP. The identified impacts are considered mostly to be manageable through imposition of low vehicle speeds and education of new residents about local wildlife management. The impacts from the project have been identified and management measures have been subsequently developed. The proposed action is not considered to pose a threat of serious or irreversible damage to the local Koala population or the broader environment. Potential impacts have been considered and management plans will be in place to ensure that any impacts are minimised and offset.
3. The global dimension of environmental impacts of actions and policies should be recognised and considered.
The project is not considered to have a global impact, however, it is recognised that the principles of ESD are enshrined within many international treaties and national policies. This development proposal demonstrates ESD by taking into account environmental, social and economic considerations in the decision making process. The purpose of relevant international agreements on ESD is to promote the consideration of ESD principles for a variety of actions at all levels across the globe. By taking ESD into account, this project has satisfied global objectives. The overall global environmental impact however will be extremely minimal.
4. The need to develop a strong, growing and diversified economy which can enhance the capacity for environmental protection should be recognised.
The relationship between economic development and environmental protection has been continuously identified within international agreements and national policies. In particular, the Kuznets Curve shows a link between economic development and environmental protection, whereby once a society reaches a particular level of development, it starts to recognise and invest in environmental conservation. Economic development and prosperity allows for a greater financial resource base to be dedicated to conservation outcomes. This can be demonstrated at global, national and localised scales. Individual landholders are not generally in a position to be undertaking significant rehabilitation projects on their land. This project presents an important opportunity to rehabilitate and protect 41.3 hectares through the proposed offset and results in an important conservation function by increasing the availability of large, connected areas of habitat free of threats caused by weeds, fences, dogs and vehicles through the dedication of ecological corridors.
5. The need to maintain and enhance international competitiveness in an environmentally sound manner should be recognised.
The project will not cause significant residual adverse impacts to the environment. This project will increase housing availability and affordability within South East Queensland, which will contribute to Australia's overall property market. Further, the site is located within the Greater Springfield which has been strategically planned for urban growth.
6. Cost effective and flexible policy instrument should be adopted, such as improved valuation, pricing and incentive mechanisms.
This project has taken into account the EPBC Act Offsets Policy, which provides for the cost effective analysis of proposed offsets.
7. Decisions and actions should provide for broad community involvement on issues which affect them.
The overarching Springfield Structure Plan was adopted as part of the *Ipswich Planning Scheme 2006* and was subject to extensive public consultation during its design phase in accordance with the *Integrated Planning Act 1997*. The development intent of Greater Springfield has incorporated public opinions and addressed public concerns. As part of the Greater Springfield development, consultation was undertaken with indigenous stakeholders and cultural heritage experts. On 25 June 1999, a cultural heritage conservation plan for the Springfield Structure Plan was approved by the Environmental Protection Agency. All development within the Springfield Structure Plan operates in accordance with this approved cultural heritage conservation plan.

ESD Core Objectives
Additionally, this preliminary documentation will be made available for public comment during the notifications stage the of EPBC Act assessment process. Submissions by the community will be reviewed by the Proponent as part of finalising the detailed design.

9. Conclusion

The *Environmental Management Division* of **Saunders Havill Group** were commissioned to prepare this Preliminary Documentation Report to support assessment of the Peninsula Precinct project as required under the EPBC Act. The project is a residential development and mixed-use precinct at Springfield College Drive, Springfield, Queensland. A Controlled Action decision with assessment through Preliminary Documentation was determined on 7 October 2020 (EPBC 2020/8629) in response to the submitted Referral on behalf of the proponent, **Springfield City Group Pty Ltd**. The decision was based on:

- Listed threatened species and communities (sections 18 & 18A)
- Listed migratory species (sections 20 & 20A)

This Preliminary Documentation Report provides information requested by DCCEEW to assist the assessment manager in assessing the potential impacts of the proposed action. The proposal will result in clearing of 18.90 ha of remnant habitat critical to the survival of the Koala, Grey-Headed Flying-fox, Regent Honeyeater and Swift Parrot.

A significant residual impact is anticipated for impacts to critical habitat for the Koala, Grey-Headed Flying-fox, Regent Honeyeater and Swift Parrot and therefore an offset is required. The Proponent will provide an offset in accordance with the EPBC Act Environmental Offsets Policy.

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11. Attachments

Attachment A1

EPBC Act Controlled Action Decision Notice

Attachment A2

Additional Information Request

Attachment A3

EPBC Referral Material

Attachment A4

Koala Connectivity and Sustainability Analysis, BAAM Pty Ltd 2026

Attachment A5

Wildlife Aerial Thermal Imagery Analysis

Attachment A6

Greater Glider Connectivity Analysis

Attachment A7

Greater Springfield Fauna Spotter Catcher Analysis

Attachment A8

Impact Area Raw Transect Data

Attachment A9

Rosevale Offset Management Plan – ROA 3

Attachment A10

Cultural Heritage Conservation Plan

Attachment A1

EPBC Act Controlled Action Decision Notice

Australian Government
Department of Agriculture, Water and the Environment

Notification of
REFERRAL DECISION AND DESIGNATED PROPONENT – controlled action
DECISION ON ASSESSMENT APPROACH

Peninsula Precinct, Springfield, Queensland (EPBC 2020/8629)

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

proposed action	To develop a master planned town centre community on Lot 63 on SP291400, at 7002 Brookwater Drive, Springfield, Queensland. [See EPBC Act referral 2020/8629].
decision on proposed action	The proposed action is a controlled action. The project will require assessment and approval under the EPBC Act before it can proceed.
relevant controlling provisions	Listed threatened species and communities (sections 18 & 18A) Listed migratory species (sections 20 & 20A)
designated proponent	Springfield City Group Pty Limited ABN: 35 055 714 531
assessment approach	The project will be assessed by preliminary documentation.

Decision-maker

Name and position	Richard Miles Acting Assistant Secretary Environment Assessments Queensland and Sea Dumping Branch
Signature	
date of decision	7 October 2020

Attachment A2

Additional Information Request

Australian Government
Department of Agriculture, Water and the Environment

EPBC Ref: 2020/8629

Mr Russell Luhrs
Chief Operating Officer
Springfield City Group Pty Ltd
145 Sinnathamby Blvd
Springfield Central QLD 4300

Dear Mr Luhrs

Additional information required for preliminary documentation
Peninsula Precinct, Springfield, Queensland (EPBC 2020/8629)

I am writing to you in relation to your proposal to develop a master planned town centre community on Lot 63 on SP291400, at 7002 Brookwater Drive, Springfield, Queensland.

On 7 October 2020, a delegate of the Minister decided that the proposed action is a controlled action and that it will be assessed by preliminary documentation. Further information will be required to be able to assess the relevant impacts of the proposed action.

Details outlining the further information required are at Attachment A. Details outlining the information requirements for offset proposals required under the EPBC Environmental Offsets Policy are at Attachment B.

Details on the assessment process and the responsibilities of the proponent are set out in the enclosed fact sheet. Further information is available from the department's website at http://www.environment.gov.au/epbc.

If you have any questions about the assessment process or the further information required, please contact Amanda Roberts, by email to amanda.roberts@awe.gov.au, or telephone (02) 6274 2789 and quote the EPBC reference number shown at the beginning of this letter.

Yours sincerely

Richard Miles
Director
Queensland South and Sea Dumping Section
14 October 2020

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

Peninsula Precinct, Springfield, Queensland (EPBC 2020/8629)

1. General content, format and style

The preliminary documentation must:

1.1	Include: a) The information contained in your original referral b) All additional information submitted to the Department in support of the referral c) The further information you provide on the impacts of the proposed action and the strategies you propose to avoid, mitigate, and/or offset those impacts (as described below), and d) Other relevant information on the matters protected by the EPBC Act.
1.2	Follow the structure of this information request.
1.3	Include a copy of these guidelines and a reference table indicating where to find the information fulfilling this request.
1.4	Contain sufficient information to enable interested stakeholders and the Minister (or delegate) to understand the environmental consequences of the proposed development on matters of national environmental significance (MNES). Specifically, it must contain sufficient information to allow the Minister (or delegate) to make an informed decision on whether or not to approve, under Part 9 of the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act), the undertaking of the action for the purposes of each controlling provision. Please note that the Department may require further information, in addition to the information required below, should new information come to light during the assessment stage (e.g. an additional species has been identified onsite).
1.5	Ensure all work and conclusions: a) Are evidence based and the evidence is provided. b) Use scientifically robust methodologies appropriate to the purpose, detail why the methodology/s was selected, and are described and referenced. c) Consider and state any limitations in the chosen approach. d) Are supported by peer reviewed literature, with references provided, or expert opinion. e) Are presented clearly, unambiguously, succinctly and objectively.

	f) Are, where appropriate, supported by maps, plans, diagrams or other descriptive detail. g) Demonstrate consideration of relevant Approved Listing Advice(s), Approved Conservation Advice(s), Recovery Plan(s), Threat Abatement Plan(s) or comparable policy guidelines, and approved survey methods.
1.6	Be able to read as a stand-alone document and must include summaries of all relevant information. Detailed technical information, studies, or investigations necessary to support the main text should be attached as appendices to the main document.

2. Description of the action

The preliminary documentation must include a description of the action:

2.1	Including: a) The location, boundaries, and size (in hectares) of the disturbance footprint, and of adjoining areas and vegetation, which may be indirectly impacted by the proposal, including from material stockpiles, vehicle access and associated activities. b) A description of all components of the proposed action, including the anticipated timing and duration, (including start and completion dates) of each component of the proposed action. This should include a detailed outline of the expected timing of any staged clearing over the construction period. c) A description of the construction and operation of the residential development and associated works (i.e. activities that comprise its operation). d) An indicative layout plan for the proposed action area, including the location and type of land use, key infrastructure, and the number and location of dwellings, other buildings, open space, and conservation areas.

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

Listed threatened species and ecological communities and listed migratory species

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

- Koala (*Phascolarctos cinereus*) (combined populations of Qld, NSW and the ACT) – vulnerable
- Grey-headed Flying-fox (*Pteropus poliocephalus*) – vulnerable
- Regent Honeyeater (*Anthochaera phrygia*) – critically endangered
- White-throated Needletail (*Hirundapus caudacutus*) – vulnerable and migratory.

Note that this may not be a complete list and it is your responsibility, as the proponent, to ensure that any species or ecological communities listed under the EPBC Act at the time of the controlled action decision, which will or are likely to be significantly impacted by the proposed action, are assessed for the Minister's consideration. Any listing events (i.e. new listing or up-listing of a species or ecological community, e.g. from vulnerable to endangered category) that occur after the controlled action decision was made do not affect the approval process decision, as set out in s158A of the EPBC Act.

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

Koala (*Phascolarctos cinereus*) (combined populations of QLD, NSW and the ACT) – vulnerable

Based on information available, the Department considers that:

a. The species is known to occur at the proposed action site.

b. The entire 18.90 ha proposed action site contains habitat critical to the survival of the species (see *Habitat quality* section below).

c. The proposed action site is located adjacent to potential habitat to the north, north-east, and east of the proposed action site.

Habitat quality

In accordance with the Koala habitat assessment tool in the EPBC Act referral Guidelines for the listed Koala, the referral notes that the site contains habitat critical to the survival of the Koala with a score of 7. The Department disagrees with this score and considers that a score of 8 is more appropriate for the following reasons:

a. Koala occurrence (+2) – evidence of one or more koalas within the last two years.

b. Vegetation composition (+2) – has forest or woodland with two or more known koala food tree species.

c. Habitat connectivity (+2) – area is part of a contiguous landscape ≥ 500 ha.

d. Key existing threats (+1) – evidence of infrequent or irregular Koala mortality from vehicle strike or dog attack at present.

e. Recovery value (+1) – it is uncertain whether the habitat is important for achieving the interim recovery objectives detailed in the referral guidelines:

    - The referral guidelines note that the interim recovery objectives for Koala in the coastal context are to protect and conserve large, connected areas of habitat critical to the survival of the Koala and maintain corridors and connective habitat that allows movement of Koala between large areas of habitat.
    - As noted in relation to the connectivity score, the proposed action site is connected to 675 ha of known Koala habitat to the north, north-east, and east of the site.
    - The Department considers that, while the proposed action site is located near existing areas of urban development, it is connected to large areas of contiguous habitat and it is therefore at least uncertain whether the habitat is important for achieving the interim recovery objectives for the coastal context.

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

Based on information available, the Department considers that:

a. The proposed action site is located within foraging distance of Grey-headed Flying-fox camps.

b. The proposed action site contains habitat critical to the survival of the species, with year-round foraging resources, including key winter and spring flowering species. The 1.82 ha area identified as tracts and an easement on the proposed action site may also contain habitat for the species.

c. The proposed action site is located adjacent to habitat to the north, north-east and east of the proposed action site.

Regent Honeyeater (*Anthochaera phrygia*) – critically endangered

Based on information available, the Department considers that:

a. The species is known to occur in the area.

b. The proposed action site may contain habitat critical to the survival of the species as defined in the National Recovery Plan[1]. The site contains suitable foraging habitat, including key foraging tree species *Corymbia citriodora* and *Eucalyptus robusta*.

c. Surveys conducted at the proposed action site may not have been undertaken in accordance with the *Survey Guidelines for Australia's Threatened Birds*[2], noting that the optimal time for surveys coincides with the heavy flowering period for key foraging tree species present on-site.

White-throated Needletail (*Hirundapus caudacutus*) – vulnerable and migratory

Based on information available, the Department considers that:

a. The species is known to occur in the area.

b. The proposed action site contains suitable roosting habitat, as described in the species' SPRAT profile[3], which is considered to be habitat critical to the survival of the species. The Conservation Advice[4] for the species lists the loss of roosting habitat as a key threat.

c. Surveys are recommended to be undertaken as late as possible in the evening as individuals come in to roost in tall trees[5].

All MNES

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. Specific matters this section must address include, but are not limited to:

3.1	A description of any potential MNES (including but not limited to those listed in this request for further information) that occur in the project area and adjacent areas.

[1] Department of the Environment, 2016, *National Recovery Plan for the Regent Honeyeater* (Anthochaera phrygia), Canberra, available at: http://www.environment.gov.au/biodiversity/threatened/recovery-plans/national-recovery-plan-regent-honeyeater-anthochaera-phrygia-2016

[2] Department of the Environment, Water, Heritage and the Arts, 2010*, Survey Guidelines for Australia's Threatened Birds. EPBC Act survey guidelines 6.2*, Canberra, available at: http://www.environment.gov.au/epbc/publications/survey-guidelines-australias-threatened-birds-guidelines-detecting-birds-listed-threatened

[3] SPRAT profile for the White-throated Needletail (*Hirundapus caudacutus*), available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=682

[4] Threatened Species Scientific Committee, 2019, *Conservation Advice* Hirundapus caudacutus *White-throated Needletail,* Canberra, available at: http://www.environment.gov.au/biodiversity/threatened/species/pubs/682-conservation-advice-04072019.pdf

[5] Department of the Environment, 2015, *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act*, Canberra, available at: http://www.environment.gov.au/biodiversity/threatened/publications/epbc-act-referral-guidelines-migratory-birds

3.2	A description and map of the current land use/s, land topography, surface and ground water bodies, waterways and vegetation communities (habitat types as they relate to potentially impacted listed threatened and migratory species) on the proposed action site and adjoining areas.
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 for further information, this section must provide the following: a) Information on the abundance, distribution, ecology and habitat preference of the species or communities. b) Quantification of the extent of habitat and (if known) the number of individuals present or historical patterns of use on and surrounding the proposed action site (including maps identifying known or potential habitat). c) Assessment of the quality and importance of known or potential habitat for the species or communities within the proposed action site and surrounding areas. 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) Information on the survey methodology used, including a map/s of survey points or transects, how the survey points or transects were selected, when surveys were conducted (e.g. dates, time of day, season, etc) and search effort (e.g. 20 hours over 8 days). f) An assessment of the adequacy of any surveys undertaken. In particular, the extent to which these surveys were appropriate for the species and undertaken in accordance with relevant survey guidelines. g) Results of any surveys undertaken.
3.4	Information about the methods, data and scientific literature used to identify and assess the environmental values on the proposed action site and surrounding areas, including survey data and historical records. Survey data for the proposed action site must be provided for the above listed threatened species, should be as recent as possible, and must not have been collected more than five years before the date of this letter.

4. Quantification of impacts

Based on the information provided in the referral and additional information provided in support of the referral, in formation provided in the Species Profile and Threats Database, and observation records provided in the Atlas of Living Australia, the Department considers that:

- The proposed action is likely to directly impact on 17.08 ha of Koala and Grey-headed Flying-fox habitat. The proposed action is also likely to impact an additional 1.82 ha of habitat present within the proposed internal tracts and easement area for the Springfield trunk sewer construction area.

- The proposed action is likely to have indirect impacts on MNES, including on MNES and habitat adjacent to the proposed action site. Indirect impacts may result from edge effects; isolation/fragmentation of habitat; mortality or injury to MNES from increased traffic; and/or predation from domestic dogs. Direct and indirect impacts on adjacent habitat may also render this habitat functionally lost.

- Further information is required regarding the presence of habitat and potential impacts on the Regent Honeyeater and the White-throated Needletail to determine whether or not the proposed action is likely to have a significant impact on these species.

To clarify the extent and nature of impact on listed threatened species and ecological communities as a result of the proposed action, the preliminary documentation must:

4.1	Provide a description of the intended land uses proposed as part of the completed development, including any proposed conservation areas or retained movement corridors, and associated ongoing activities, and details of the intended party that would be responsible for future management activities.
4.2	Include current maps and coordinates/shapefiles of the proposed impact area and areas of habitat for MNES proposed to be retained. Maps must clearly identify development footprints, buffer zones, and any conservation areas where impacts will be avoided, and areas of adjacent habitat that would be subject to indirect impacts, including areas that are to be retained within and adjacent to the site.
4.3	Confirm the area of habitat that will be directly and indirectly impacted by the proposed action, including areas where: a) Connectivity to surrounding habitat will be retained, removed or functionally lost. b) Adjacent habitat will be subject to intensification of ongoing impacts (for example, through increased levels of dust or polluted runoff).
4.4	Confirm the quantity and quality of suitable habitat to be impacted within the proposed action area.

4.5	Provide an assessment of the direct, indirect, consequential and cumulative impacts that may occur during construction and post-construction phases, including: a) The nature and extent of impacts (including direct, indirect and facilitated impacts*), including timing and whether the impact is temporary or permanent. b) 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. c) A local and regional scale analysis of likely impacts, with reference to the project's potential contribution to cumulative impacts in the context of development patterns in the locality and region. d) A risk assessment of potential impacts from the action that are likely to be unpredictable, severe, or irreversible. *Note: Facilitated impacts may include (but are not limited to) the risk of injury or mortality to MNES as a result of the introduction of domestic dogs in a residential area, vehicle strike as a result of increased residential car use and/or the development of domestic pools.

5. Avoidance and mitigation

Further information regarding the proposed habitat for MNES is required, including (but not limited to) suitability of the areas for MNES at the proposed action site, details of the dimensions and location of the retained area, proposed measures for rehabilitation and maintenance, vegetation composition and uses.

To clarify the proposed measures to avoid and mitigate impacts, the preliminary documentation must:

5.1	Provide a consolidated description of all proposed measures to avoid and mitigate impacts, including those provided in the referral and any additional to those described in the referral. This should include: a) Discussion of consideration and assessment of alternative strategies, plans and measures to avoid and mitigate impacts (e.g. alternative project plans, retention of habitat/movement corridors/buffers, and fauna-friendly development and road design). b) Details about pre-clearance and clearance procedures to ensure that species are detected and managed to minimise mortality, stress, injury, or introduction of disease. c) A description (including maps and imagery) of the location, boundaries and size of buffer areas and/or proposed exclusion zones, and details on how these areas will be enhanced, protected and maintained, during all phases of the proposed action (for example, clearing, construction and operation).

	Also include a description of any fences or barriers which may be installed around areas where impacts will be avoided. d) Details of any rehabilitation measures to be implemented for disturbed areas, including rehabilitation objectives, target species, timing of rehabilitation stages, methodology, maintenance measures, schedules, and monitoring. e) Details of any ongoing mitigation and management measures during the operation of the facility.
5.2	For each measure proposed, indicate the: a) Responsible party b) Environmental outcomes to be achieved c) Millstones / performance / completion criteria d) Proposed monitoring and evaluation program.
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 ability of the measure to reduce the risk of a threat. 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.

6. Proposed offsets

Based on the referral information and additional information submitted in support of the referral, the Department considers that the proposed action is likely to have a residual significant impact on the Koala and the Grey-headed Flying-fox. Further information is sought above to confirm whether significant residual impacts are likely on the Regent Honeyeater and the White-throated Needletail.

Where residual significant impacts remain after consideration of avoidance and mitigation measures, an environmental offset will be required to compensate for the impacts in accordance with the *Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy* (EPBC Offsets Policy). Offsets must be specific to the species or ecological community being impacted and must improve or maintain the viability of the species.

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

6.1	Demonstrate how the offset proposal: a) Meets the principles outlined in the EPBC Offsets Policy. b) Address the considerations and requirements outlined in the EPBC Offsets Policy, including but not limited to sections 6 and 7 of the EPBC Offsets Policy. c) Directly contributes to the ongoing viability of the EPBC listed species or ecological community or migratory species and will deliver an overall conservation outcome that improves or maintains the viability of the protected matter, as compared to what is likely to have occurred under the status quo, i.e. if neither the action nor the offset had taken place. d) Compensates for the impact over the entire duration of the impact (i.e. should impacts be in perpetuity, the offsets must also be delivered in perpetuity). Note: while the offsets do not need to be secured before the decision on whether to approve the proposed action, should the proposed action be approved, conditions of an approval are likely to require that offsets are secured, and management measures are in place, before commencement of the proposed action.
6.2	For further details regarding offset requirements, see Attachment B.

Habitat quality assessment methodology

The Department notes that a suitable methodology must be used to determine habitat quality at the offset site for input into the EPBC Act Offsets Assessment Guide (i.e. the 'calculator').

In the past, the Koala habitat assessment tool at Table 4 (p. 27) of the *EPBC Act referral guidelines for the listed Koala* has been used by proponents to assess habitat quality for that species at proposed offset sites, however the Department notes that this methodology may not accurately account for potential habitat quality improvements as a result of management measures over time.

The Department notes that:

- The methodology chosen to assess habitat quality must be evidence-based, quantitative, robust and repeatable.

The same methodology to assess habitat quality must be used at both impact and offset sites for input into the EPBC Act Offsets Assessment Guide (i.e. the 'calculator').

- The quality score for an area of habitat must relate directly to habitat requirements of the species (e.g. number of Koala feed trees). Note that this may inform outcome-based conditions if the Minister decides to approve the proposed action.

- There are three components that need to be considered when calculating habit quality: site condition, site context, and species stocking rates.

The Department encourages all proponents to initially consult the Department on appropriate methodology to calculate a habitat quality score, before conducting their assessment.

7. Economic and social matters

The preliminary documentation must:

7.1	Provide details on the social and economic costs and/or benefits of undertaking the proposed action, including the basis for any estimations of costs and/or benefits. Where possible, please include the total economic capital investment and economic ongoing value of the project.
7.2	Identify if economic benefits and employment opportunities are in addition to what would have been expected if the action were not to take place.
7.3	Provide details of any public stakeholder consultation activities, including the outcomes of those consultations.
7.4	Provide details of any consultation with Indigenous stakeholders.

8. Ecologically sustainable development

The preliminary documentation must:

8.1	Provide a description of how the proposed action meets the principles of ecologically sustainable development, as defined in section 3A of the EPBC Act.

ATTACHMENT B
INFORMATION REQUIREMENTS FOR EPBC ACT OFFSET PROPOSALS

The offset proposal must include, but not be limited to, the following:

Details in relation to the proposed offset package, including:

a) A description of the proposed offset site(s) including location, size, condition, and relevant ecological/species habitat features, landscape context and cadastre boundaries of the offset site(s) (supported by mapping).

b) Evidence of the presence of, or usage by, relevant protected matter(s) on, or adjacent to the proposed offset site(s), and the presence and quality of habitat for protected matter(s) on the proposed offset site.

c) Current and likely future tenure of the proposed offset site and details of how the offset site will be legally secured for the full duration of the impact.

Details and justification demonstrating how the proposed offset package will maintain or improve the viability of the protected matter(s) consistent with the EPBC Environmental Offsets Policy and *EPBC Act Offsets Assessment Guide*. This includes:

a) Offset completion criteria (i.e. environmental outcomes) to be achieved, and reasoning for these in reference to relevant statutory recovery plans, conservation advices, and threat abatement plans (e.g. within 15 years of commencement of the action, 85 per cent of the offset site contains X number of Koala habitat trees).

b) Milestones to demonstrate adequate progress towards achieving the offset completion criteria (e.g. within 10 years of commencement of the action the proponent must increase, by at least 20 per cent, the number of available Koala food trees at the offset site).

c) Specific environmental management activities and mitigation that will attain and maintain the completion criteria, including the management of threats to relevant species and the timing of actions (e.g. complete the planting, and ensure a survival rate of 90 per cent, of at least 15, 000 seed, sapling, or tube stock (or equivalent) Koala food tree species within five years following commencement of the action; reduce the invasive weed coverage on the offset site to 5 per cent within five years following commencement of the action implement an annual non-native feral pest control program over a 10 year period).

d) Baseline survey information to determine the presence of relevant protected matters 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.

e) A monitoring and corrective action program to measure the success of the environmental outcomes, which must include performance indicators, milestone outcomes, monitoring requirements, trigger values, corrective measures, and identified roles and responsibilities in accordance with the requirements in section 3 of the Departments Environmental Management Plan Guidelines:

https://www.environment.gov.au/epbc/publications/environmental-management-plan%ADguidelines

f) Evidence of how the proposed offset completion criteria for the offset will be maintained over the duration of the impact (including any registered interest on the land, conditions of the legal security mechanism, how these conditions will be met, and how achievement of legal security will be demonstrated to the Department). Note: The EPBC Offsets Policy states that the offset should secure and manage the offset site for the life of the impact.

g) Justification of how the offset package meets the *EPBC Act Offsets Assessment Guide*, in particular:

- Evidence of the likely effectiveness of any proposed management actions (i.e. rehabilitation / restoration / re-creation of habitat) to support quality improvement and/or maintenance of the proposed offset site(s) for the relevant protected matter(s).
- The time over which management actions will deliver the proposed improvement or maintenance of habitat quality for the relevant protected matter(s).
- The risk of damage, degradation or destruction to any proposed offset site(s), in the absence of any formal protection and/or management, over a foreseeable time period (20 years). This information is important in determining the comparative benefit of a proposed offset.
- Evidence to support ‘confidence in results’ for averted loss and quality scores.

Note: where increases in habitat quality of the offset site are being proposed by the proponent to meet the direct offset requirements, the Department will require specific details of site condition, site context or stocking rate measures to be implemented commensurate to the expected level of habitat improvement.

Attachment A3

EPBC Referral Material



EPBC 2020/8629 Referral Material

Peninsula Precinct, Springfield, QLD

Prepared for Springfield City Group

October 2025

EPBC Act referral

Australian Government
Department of Agriculture, Water and the Environment

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Title of proposal	**2020/8629 - Peninsula Precinct - Springfield, Queensland**

Section 1

Summary of your proposed action

1.1 Project industry type Residential Development

1.2 Provide a detailed description of the proposed action, including all proposed activities

The proposed development footprint will occupy approximately entirety of the 18.90 ha referral area. The proposed development will include a mixed precinct comprising:
Town Business;
Retail;
Education; and
Town Residential.

1.3 What is the extent and location of your proposed action?

See Appendix B

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland)

Springfield City Group Pty Ltd is proposing to develop a master planned town centre community on land located 7002 Brookwater Drive, Brookwater. The site is located on one (1) land parcel, described as, Lot 63 on SP291400. The site is adjacent to the Brookwater Golf Course and residential community and more broadly surrounded by a local school, future sports precinct and town centre shopping precinct. Environmental features adjoining the site include Opossum Creek to the north and Mountain Creek to the east.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

18.90ha

1.7 Proposed action location

Lot - Lot 63 on SP291400

1.8 Primary jurisdiction Queensland

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

☐ Yes ☑ No

1.10 Is the proposed action subject to local government planning approval?

☑ Yes ☐ No

1.10.1 Is there a local government area and council contact for the proposal?

☐ Yes ☑ No

1.11 Provide an estimated start and estimated end date for the proposed action

Start Date 01/12/2020
End Date 31/12/2040

1.12 Provide details of the context, planning framework and state and/or local Government requirements

The site is located within Ipswich City Council (ICC) but lies within the Springfield Structure Plan (SSP) area. The SSP sets out the broader planning framework for land within the structure plan boundary. The Peninsula Precinct will be developed in

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accordance with the SSP, Springfield Town Centre Concept Plan (STCCP) and Springfield Town Centre North Overarching Master Planning Framework (OMPF). The SSP and STCCP designate the land as Town Centre and Town Centre Residential, respectively, while under the Springfield Town Centre North OMPF the land has been planned as a mixed precinct comprised of Town Business, Retail, Education and Town Residential Precincts.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders

The overarching Springfield Structure Plan was adopted as part of the Ipswich Planning Scheme 2006 and was subject to extensive public consultation during its design phase in accordance with the Integrated Planning Act 1997. The development intent of Greater Springfield has incorporated public opinions and addressed public concerns.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project

The proposed action does not trigger an Environmental Impact Assessment under Queensland legislation.

1.15 Is this action part of a staged development (or a component of a larger project)?

☐ Yes ☑ No

1.16 Is the proposed action related to other actions or proposals in the region?

☐ Yes ☑ No

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 2

Matters of national environmental significance

2.1 Is the proposed action likely to have any direct or indirect impact on the values of any World Heritage properties?

☐ Yes ☑ No

2.2 Is the proposed action likely to have any direct or indirect impact on the values of any National Heritage places?

☐ Yes ☑ No

2.3 Is the proposed action likely to have any direct or indirect impact on the ecological character of a Ramsar wetland?

☐ Yes ☑ No

2.4 Is the proposed action likely to have any direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

☑ Yes ☐ No

Species or threatened ecological community

Koala

Impact

Koalas are found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland and the species is known to occur in the locality. Extensive searches for this species, including spot assessment technique (SAT) surveys and scat meanders were completed across the referral area and only indirect evidence in the form of scats was observed. The assessment against the EPBC Significant Impact Guidelines 1.1 indicates the proposed action is highly unlikely to have a significant impact on the Koala (the species), however is identified to contain vegetation which meets the definition of critical habitat for the survival of the Koala. An assessment against the Koala Referral Guidelines identified that the project will involve the direct clearing of 18.90 hectares of critical habitat for the Koala scored using the Koala Habitat Assessment Tool as providing a Habitat Score of 7. Under the Koala Referral Guidelines, the action is likely to have a significant impact on the species through the clearing of critical habitat.

Species or threatened ecological community

Grey-headed Flying-fox

Impact

This species generally roosts in camps in trees adjacent to larger permanent watercourse. The GHFF requires foraging resources and roosting sites and is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feeds on commercial fruit crops, however the primary food source is blossom from Eucalyptus and related genera. 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. The proposed action will result in the direct impact (clearing) of approximately 18.90 ha of native vegetation available foraging habitat for the GHFF (utilisation not confirmed). The proposed action has the potential to impact on foraging habitat for the GHFF.

2.4.2 Do you consider this impact to be significant?

☑ Yes ☐ No

2.5 Is the proposed action likely to have any direct or indirect impact on the members of any listed migratory species or their habitat?

☐ Yes ☑ No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

☐ Yes ☑ No

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

2.7 Is the proposed action likely to be taken on or near Commonwealth land?

☐ Yes ☑ No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

☐ Yes ☑ No

2.9 Is the proposed action likely to have any direct or indirect impact on a water resource from coal seam gas or large coal mining development?

☐ Yes ☑ No

2.10 Is the proposed action a nuclear action?

☐ Yes ☑ No

2.11 Is the proposed action to be taken by a Commonwealth agency?

☐ Yes ☑ No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage place overseas?

☐ Yes ☑ No

2.13 Is the proposed action likely to have any direct or indirect impact on any part of the environment in the Commonwealth marine area?

☐ Yes ☑ No

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 3

Description of the project area

3.1 Describe the flora and fauna relevant to the project area

Field survey confirmed that the referral area contains predominantly remnant vegetation, excluding the internal tracks and more recent Springfield trunk sewer construction easement. The vegetation on-site is considered to be accurately mapped as 'remnant' vegetation due to the cessation of logging activities. The 'remnant' Category B vegetation communities contain species consistent of the mapped regional ecosystems, being RE12.9-10.2 and RE12.3.11.

The 'remnant' RE12.9-10.2 vegetation community was dominated by Corymbia citriodora (Spotted Gum) with associated canopy species including Eucalyptus crebra (Narrow-leaved Ironbark), Eucalyptus moluccana (Gum-topped Box) and Eucalyptus fibrosa (Broad-leaved Ironbark). The understorey was dominated by regrowth Acacia spp. and Alphitonia excelsa (Soap Tree), while the groundcover contained an abundance of leaf litter and isolated areas of Lantana camara infestations. The canopy height and coverage of the mapped 'remnant' RE12.9-10.2 is consistent with the remnant status definition.

The 'remnant' RE12.3.11 vegetation community was dominated by Eucalyptus grandis (Flooded Gum) with associated canopy species including Corymbia intermedia (Pink Bloodwood), Lophostemon suaveolens (Swamp Box) and Corymbia tesselaris (Moreton Bay Ash). The understorey was dominated by Celtis sinensis (Chinese Elm) and Cinnamomum camphora (Camphor Laurel) with scattered native species including Lophostemon confertus (Brush Box), Acacia spp. and Leptospermum liversidgei (Lemon-scented Tea-tree). The groundcover was dominated by Lantana camara (Lantana) with limited to no native grass or forb cover. The canopy height and coverage of the mapped 'remnant' RE12.3.11 is consistent with the remnant status definition.

Detailed flora and fauna discussions are included in the Ecological Assessment – Matters of National Environmental Significance prepared by SHG, dated March 2020.

3.2 Describe the hydrology relevant to the project area (including water flows)

The referral area contains a high point in the southern / central portion of the site where the ground elevation is approximately 65-70m AHD. The site falls to the east and west to low points along Opossum Creek outside of the referral area, where the elevation is approximately 30m AHD. Adjacent to the referral area is Opossum Creek which is identified as a considerable waterway within the Ipswich local government area.

3.3 Describe the soil and vegetation characteristics relevant to the project area

Land zone 9-10 dominates the majority of the site, consisting of fine to coarse grained sedimentary rocks, including sandstone, siltstones, mudstones and shales. Land zone 3 is situated in association with the fringing area of Opossum Creek.

Land zone 9-10 is described as "undulating country on fine grained sedimentary rocks and course grained sedimentary rocks", while land zone 3 is described as "recent quaternary alluvial systems".

The location and extent of the field verified vegetation communities is depicted in the Ecological Assessment – Matters of National Environmental Significance prepared by SHG, dated March 2020.

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area

From an MNES perspective, no outstanding natural features and/or any other important or unique values relevant to the project area were identified on or proximal to the subject site.

3.5 Describe the status of native vegetation relevant to the project area

Field survey confirmed that the referral area contains predominantly remnant vegetation, excluding the internal tracks and more recent Springfield trunk sewer construction easement. The vegetation on-site is considered to be accurately mapped as 'remnant' vegetation due to the cessation of logging activities. The 'remnant' Category B vegetation communities contain species consistent of the mapped regional ecosystems, being RE12.9-10.2 and RE12.3.11.

The 'remnant' RE12.9-10.2 vegetation community was dominated by Corymbia citriodora (Spotted Gum) with associated canopy species including Eucalyptus crebra (Narrow-leaved Ironbark), Eucalyptus moluccana (Gum-topped Box) and Eucalyptus fibrosa (Broad-leaved Ironbark). The understorey was dominated by regrowth Acacia spp. and Alphitonia excelsa (Soap Tree), while the groundcover contained an abundance of leaf litter and isolated areas of Lantana camara infestations. The canopy height and coverage of the mapped 'remnant' RE12.9-10.2 is consistent with the remnant status definition.

The 'remnant' RE12.3.11 vegetation community was dominated by Eucalyptus grandis (Flooded Gum) with associated

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canopy species including Corymbia intermedia (Pink Bloodwood), Lophostemon suaveolens (Swamp Box) and Corymbia tesselaris (Moreton Bay Ash). The understorey was dominated by Celtis sinensis (Chinese Elm) and Cinnamomum camphora (Camphor Laurel) with scattered native species including Lophostemon confertus (Brush Box), Acacia spp. and Leptospermum liversidgei (Lemon-scented Tea-tree). The groundcover was dominated by Lantana camara (Lantana) with limited to no native grass or forb cover. The canopy height and coverage of the mapped 'remnant' RE12.3.11 is consistent with the remnant status definition.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area

The referral area contains a high point in the southern / central portion of the site where the ground elevation is approximately 65-70m AHD. The site falls to the east and west to low points along Opossum Creek outside of the referral area, where the elevation is approximately 30m AHD. Adjacent to the referral area is Opossum Creek which is identified as a considerable waterway within the Ipswich local government area.

3.7 Describe the current condition of the environment relevant to the project area

Field survey confirmed that the referral area contains predominantly remnant vegetation, excluding the internal tracks and more recent Springfield trunk sewer construction easement. The vegetation on-site is considered to be accurately mapped as 'remnant' vegetation due to the cessation of logging activities. The 'remnant' Category B vegetation communities contain species consistent of the mapped regional ecosystems, being RE12.9-10.2 and RE12.3.11.

The 'remnant' RE12.9-10.2 vegetation community was dominated by Corymbia citriodora (Spotted Gum) with associated canopy species including Eucalyptus crebra (Narrow-leaved Ironbark), Eucalyptus moluccana (Gum-topped Box) and Eucalyptus fibrosa (Broad-leaved Ironbark). The understorey was dominated by regrowth Acacia spp. and Alphitonia excelsa (Soap Tree), while the groundcover contained an abundance of leaf litter and isolated areas of Lantana camara infestations. The canopy height and coverage of the mapped 'remnant' RE12.9-10.2 is consistent with the remnant status definition.

The 'remnant' RE12.3.11 vegetation community was dominated by Eucalyptus grandis (Flooded Gum) with associated canopy species including Corymbia intermedia (Pink Bloodwood), Lophostemon suaveolens (Swamp Box) and Corymbia tesselaris (Moreton Bay Ash). The understorey was dominated by Celtis sinensis (Chinese Elm) and Cinnamomum camphora (Camphor Laurel) with scattered native species including Lophostemon confertus (Brush Box), Acacia spp. and Leptospermum liversidgei (Lemon-scented Tea-tree). The groundcover was dominated by Lantana camara (Lantana) with limited to no native grass or forb cover. The canopy height and coverage of the mapped 'remnant' RE12.3.11 is consistent with the remnant status definition.

Connectivity towards the south and west is limited by major arterial roads and large-scale residential development. The development to the west is associated with a current EPBC approval (EPBC2016/7676).

The site retains connectivity to the north and east, with the site adjoining existing known koala habitat on the Opossum Creek and Mountain Creek corridors and vacant bushland to the north. Currently, the site is connected to approximately 675 ha.

3.8 Describe any Commonwealth Heritage places or other places recognised as having heritage values relevant to the project

The EPBC Act Protected Matters Report indicated that no World Heritage Properties, National Heritage Places or any other Commonwealth Heritage Places exist within a 5 km radius of the site of the proposed action.

3.9 Describe any Indigenous heritage values relevant to the project area

Not applicable

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area

Freehold

3.11 Describe any existing or any proposed uses relevant to the project area

The site is currently vacant and consists of predominantly native vegetation. The proposed development footprint will occupy approximately entirety of the 18.90 ha referral area. The proposed development will include a mixed precinct comprising:
Town Business;
Retail;
Education; and
Town Residential.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 4

Measures to avoid or reduce impacts

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action

One of the purposes of this report is to identify potential impacts upon ecological values and provide guidance for further design development. Therefore, where practicable, the detailed design stage should consider the extent of the final project footprint in respect to avoiding and minimising impacts to areas of remnant and riparian vegetation, TECs and key habitat values therein.

A Vegetation Clearing and Management Plan (VC&MP) should form part of the broader management document submitted as part of the operational works application for the development site. The VC&MP should cover clearing of all vegetation listed in this report and include details on:

Clearly show trees to be removed
All civil works likely to impact on existing vegetation
Temporary and permanent exclusion and protection fencing
Roles and responsibilities for site contractors, the developer and the consultant group
Stockpiling and site access locations
A clearing sequence plan showing the commencement of clearing and direction of removal (this should be in conjunction with the Fauna Management Plan to allow for the appropriate flushing of fauna towards safe havens and/or the application of an appropriate relocation program)
Links to weed management and revegetation proposals
The stock piling and reuse of cleared vegetation

A Fauna Management Plan (FMP) should be prepared for potential impacts of the construction phase covering the loss of vegetated areas, isolated trees and likely barriers and impediments to local dispersal.

The FMP should link closely with the VC&MP and include details on:

Species surveyed as using the site with a focus on those most likely impacted by development works
A list of relevant State and Commonwealth legislation constraints and controls for the above listed fauna
A plan showing existing habitat opportunities and locations
Details of the threats to existing fauna species
Clearing sequence plan from the VC&MP
Management and mitigation measures i.e. temporary use of fauna exclusion fencing
Fauna spotter role, contacts and certification
Specific fauna management procedures for potential or known habitat trees

A Rehabilitation Management Plan (RMP) should form part of the broader management document submitted as part of the operational works drawings for the referral area, and will generally include information on:

Rehabilitation approaches in accordance with SEQ Ecological Restoration Guidelines (SEQRF)
Existing and proposed contours
Locations of services, earthworks
Existing vegetation to be retained, removed
Location of waterways and waterbodies
Major weed infestations and proposed treatments
Trail and path systems

A registered and suitability qualified fauna spotter catcher/ecologist will need to be employed for the construction phase of the Project to implement a protocol of best management practises. Significance habitat features, should any be identified on site, will be flagged prior to clearing events and these areas supervised by an appropriately experienced ecologist. Identified within the clearing supervision protocol should be flagging of hollow bearing trees followed by the removal of vegetation surrounding them. After 24 to 72 hours, these trees should then be removed. Trees must be directionally felled into open or already cleared areas.

The objective of this is to enable hollow dependant fauna an opportunity to move on their own accord as many species utilise multiple den/roost sites within a given home range. Certain areas would be identified and flagged as significant such as old-growth trees with hollow resources and on-site identification to construction personnel will help reduce/avoid clearing. Where required, native fauna situated within areas to be cleared will be relocated to a secure area of similar habitat prior to the commencement of vegetation clearance works by a registered fauna spotter/catcher. Should any removal and relocation of nests be required, it is to be undertaken by a suitably qualified and experienced persons and advice sought where necessary.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved

The site design is considered to be in-line with on-ground values and the planning intent of the Springfield Structure Plan area. The action proposes to avoid the Opossum Creek corridor which is considered to provide significant biodiversity values to the Springfield region. Further, substantial avoidance, mitigation and management measures are proposed to ensure potential impacts environmental values are and residual impacts of clearing of 18.90 ha of critical habitat for the koala and 18.90 ha of foraging habitat for the GHFF are appropriately managed.

Refer to the Ecological Assessment – Matters of National Environmental Significance prepared by SHG, dated March 2020 for the full details.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 5

Conclusion on the likelihood of significant impacts

5.1 You indicated the below ticked items to be of significant impact and therefore you consider the action to be a controlled action

- ☐ World Heritage properties
- ☐ National Heritage places
- ☐ Wetlands of international importance (declared Ramsar wetlands)
- ☑ Listed threatened species or any threatened ecological community
- ☐ Listed migratory species
- ☐ Marine environment outside Commonwealth marine areas
- ☐ Protection of the environment from actions involving Commonwealth land
- ☐ Great Barrier Reef Marine Park
- ☐ A water resource, in relation to coal seam gas development and large coal mining development
- ☐ Protection of the environment from nuclear actions
- ☐ Protection of the environment from Commonwealth actions
- ☐ Commonwealth Heritage places overseas
- ☐ Commonwealth marine areas

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action

Not applicable

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 6

Environmental record of the person proposing to take the action

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Explain in further detail

Springfield City Group (SCG) as the master developer of the Greater Springfield Project has an excellent record of environmental management and sustainability recognised at a local, state, national and international levels.

6.2 Provide 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 either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application

EPBC2016/7676

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

☑ Yes ☐ No

6.3.1 If the person taking the action is a corporation, provide details of the corporation's environmental policy and planning framework

SCG seeks to deliver outcomes through its activities and those of its partners that support its commitment to delivering sustainable environmental management outcomes consistent with its planning framework. SCG development partners undertake development activities on SCG behalf in accordance with their Corporate environmental management policy and planning framework.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

☑ Yes ☐ No

6.4.1 EPBC Act No and/or Name of Proposal

EPBC2016/7676

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 7

Information sources

Reference source

7399 E MNES Ecological Assessment, prepared by Saunders Havill Group for Springfield City Group Pty Ltd, dated March 2020.

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Atlas of Living Australia, 2019, Spatial Data Portal [https://spatial.ala.org.au/], accessed February 2020.

Reliability

Information is reliable and current.

Uncertainties

Nil.

Reference source

Commonwealth of Australia, 2011, The Senate: Environment and Communications References Committee. The Koala – saving our national icon, Commonwealth of Australia.

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Commonwealth of Australia, 2011, The Senate: Environment and Communications References Committee. The Koala – saving our national icon, Commonwealth of Australia.

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Department of Environment & Climate Change NSW, 2008, Recovery plan for the Koala (Phascolarctos cinereus), Department of Environment & Climate Change NSW.

Reliability

Information is reliable and current.

Uncertainties

Nil

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Reference source

Department of Environment and Science (2017), Grey-headed flying-fox, Queensland Government.

Reliability

Information is reliable and current.

Uncertainties

Nil.

Reference source

Department of the Environment and Energy, 2020, Monitoring Flying-fox Populations – Interactive Flying-fox Web Viewer, Department of the Environment and Energy, Australian Government.

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Department of the Environment, 2013, Matters of Nation Environmental Significance – Significant Impact Guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999, Australian Government.

Reliability

Information is reliable and current.

Uncertainties

Nil.

Reference source

Department of the Environment, 2019, Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) in Species Profile and Threats Database, Department of the Environment, Canberra.

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Department of the Environment, 2019, Plectranthus habrophyllus in Species Profile and Threats Database, Department of the Environment, Canberra.

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Department of the Environment, 2019, Pteropus poliocephalus in Species Profile and Threats Database, Department of the Environment, Canberra.

Reliability

Information is reliable and current.

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Uncertainties

Nil

Reference source

EPBC Act Referral Guidelines for the vulnerable koala (combined populations of Queensland, New South Wales and the Australian Capital Territory), Commonwealth of Australia, 2014.

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Eyre TJ, Ferguson DJ, Hourigan CL, Smith GC, Mathieson MT, Kelly, AL, Venz MF, Hogan, LD & Rowland, J., 2018, Terrestrial Vertebrate Fauna Survey Assessment Guidelines for Queensland, Department of Environment and Science, Queensland Government, Brisbane.

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Gonzalez-Astudillo, V, Allavena, R, Mckinnon, A, Larkin, R & Henning, J, 2017, 'Decline causes of Koalas in South East Queensland, Australia: a 17-year retrospective study of mortality and morbidity', Scientific Reports, 7:42587.

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Phillips, S & Callaghan, J 2011, The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus, Australian Zoologist, 35(3): 774-780.

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Ipswich City Council, 2006, Ipswich Planning Scheme, Ipswich.

Reliability

Information is reliable and current.

Uncertainties

Nil

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Reference source

Rhodes, J. R., Beyer, H. L., Preece, H.J. and McAlpine, C.A. 2015. South East Queensland Koala Population Modelling Study. UniQuest, Brisbane, Australia

Reliability

Information is reliable and current.

Uncertainties

Nil

Reference source

Wilson, PR & Taylor, PM 2012, Land Zones of Queensland, Queensland Herbarium, Queensland Department of Science, Information Technology, Innovation and the Arts, Queensland Government, Brisbane.

Reliability

Information is reliable and current.

Uncertainties

Nil

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 8

Proposed alternatives

Do you have any feasible alternatives to taking the proposed action?

Yes ☑ No

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Section 9

Person proposing the action

9.1.1 Is the person proposing the action a member of an organisation?

☑ Yes ☐ No

Organisation

Organisation name	SPRINGFIELD CITY GROUP PTY LIMITED
Business name	
ABN	35055714531
ACN	
Business address	145 Sinnathamby Boulevard, Springfield Central, 4300, Queensland, Australia
Postal address	
Main Phone number	0738199999
Fax	
Primary email address	r.luhrs@springfieldcity.com
Secondary email address	

9.1.2 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

☐ Small business
☑ Not applicable

9.1.2.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations *

☐ Yes ☑ No

9.1.3 Contact

First name	Russell
Last name	Luhrs
Job title	Chief Operating Officer
Phone	
Mobile	
Fax	
Email	r.luhrs@springfieldcity.com
Primary address	145 Sinnathamby Blvd, Springfield Central, 4300, QLD, Australia
Address	

Declaration: Person proposing the action

I, _____, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf or for the benefit of any other person or entity.

Signature: ..... Date: .....

I, _____, the person proposing the action, consent to the designation of _____ as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature:.....Date: .....

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Proposed designated proponent

9.2.1 Is the proposed designated proponent a member of an organisation?

☑ Yes ☐ No

Organisation

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Address	

Declaration: Proposed Designated Proponent

I, _____,the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature: ..... Date: .....

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Referring party (person preparing the information)

9.3.1 Is the referring party (person preparing the information) a member of an organisation?

☑ Yes ☐ No

Organisation

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Address	

Declaration: Referring party (person preparing the information)

I, _____, declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature: ..... Date: .....

Note: PDF may contain fields not relevant to your application. These fields will appear blank or unticked. Please disregard these fields.

Appendix A

Attachment

Document Type	File Name
action_area_images	7399 E Figure 2 Site Aerial B.pdf
supporting_tech_reports	7399_EPBC_REFERRAL_PENINSULA_PRECINCT_opt_1.pdf
supporting_tech_reports	7399_EPBC_REFERRAL_PENINSULA_PRECINCT_opt_2.pdf

Appendix B

Coordinates

Area 1
-27.668701887,152.90415208
-27.668965267738,152.90387965431
-27.668477075516,152.90413045989
-27.667927298027,152.90355145534
-27.667731373969,152.90346577797
-27.667630843615,152.90316539377
-27.667444424871,152.9030099565
-27.667363028601,152.90274711553
-27.667228844618,152.90214629144
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-27.667311200537,152.90609147539
-27.668038045379,152.90553574601
-27.668265596,152.905361764
-27.668701887,152.90415208

Appendix A – Site Aerial



Legend

- Subject Site
- Referral Area
- Qld DCDB

Figure 2

Site Aerial

File ref. 7399 E Figure 2 Site Aerial B
Date *28/02/2020*
Project *Peninsula Precinct*

0 25 50 100 150 200 *m*

N

Scale (A4): 1:6,500 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland (Department of Natural Resources, Mines and Energy) 2020, Aerial (Nearmap 2020)

Appendix B – MNES Ecological Technical Report



Ecological Assessment – Matters of National Environmental Significance

EPBC Act Referral – MNES Flora and Fauna

Peninsula Precinct

Prepared for Springfield City Group
March 2020

saunders havill group

Document Control

Document: 7399 E Peninsula Precinct Ecological Assessment – Matters of National Environmental Significance, prepared by Saunders Havill Group for Springfield City Group, dated 2 March 2020.

Document Issue

Issue	Date	Prepared By	Checked By
Issue A	02.03.2020	AW	JG
Issue B			

Prepared by
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1. Introduction

Saunders Havill Group (SHG) was engaged by Springfield City Group Pty Ltd to carry out an ecological assessment of Matters of National Environmental Significance (MNES) to support a referral under the Commonwealth Government's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The purpose of this report is to identify potential MNES, specifically listed threatened species that may be impacted by the proposed urban development ('the action') of land located at 7002 Brookwater Drive, Brookwater, Queensland ('the site').

The site is located within Ipswich City Council (ICC) but lies within the Springfield Structure Plan (SSP) area. The SSP sets out the broader planning framework for land within the structure plan boundary. The Peninsula Precinct will be developed in accordance with the SSP, Springfield Town Centre Concept Plan (STCCP) and Springfield Town Centre North Overarching Master Planning Framework (OMPF). The SSP and STCCP designate the land as Town Centre and Town Centre Residential, respectively, while under the Springfield Town Centre North OMPF the land has been planned as a mixed precinct comprised of Town Business, Retail, Education and Town Residential Precincts.

1.1. Project Background

Springfield City Group Pty Ltd is proposing to develop a master planned town centre community on land located 7002 Brookwater Drive, Brookwater. The site is located on one (1) land parcel, described as, Lot 63 on SP291400. The site is adjacent to the Brookwater Golf Course and residential community and more broadly surrounded by a local school, future sports precinct and town centre shopping precinct. Environmental features adjoining the site include Opossum Creek to the north and Mountain Creek to the east. Refer to **Figure 1** for the site context and **Figure 2** for the site aerial.

1.2. Project Description

The proposed development footprint will occupy approximately entirety of the 18.90 ha referral area. The proposed development will include a mixed precinct comprising:

- Town Business;
- Retail;
- Education; and
- Town Residential.

1.3. Purpose

The purpose of this ecological assessment is to confirm the presence or absence of Matters of National Environmental Significance (MNES), which have been identified by a desktop assessment and then field verified by targeted field surveys. This ecological assessment identifies the MNES of potential relevance to the site. It assesses the significance of potential project related impacts upon relevant MNES in consideration of proposed impact avoidance and minimisation measures.

1.4. Areas of investigation

The areas of investigation for this ecological assessment include:

- Referral area – the area of the proposed development footprint, including any areas that are considered functionally lost and where temporary disturbance is required. The referral area totals approximately 18.90 ha.
- Locality – the extent of the 5 km radius database searches of the referral area.

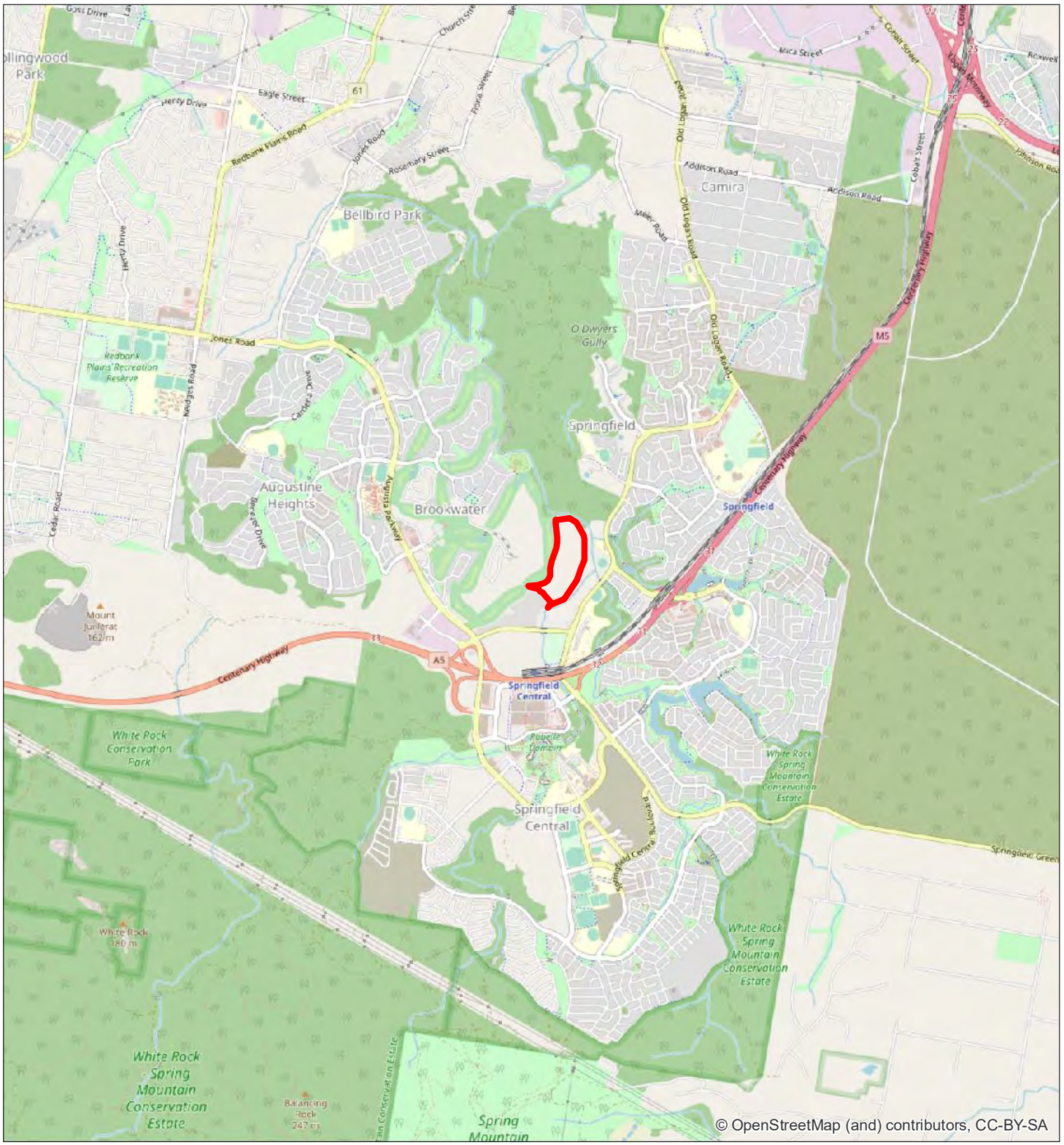
1.5. Study Limitations

The ecological assessment presented herein has involved a combination of desktop assessments and field investigations and has relied on publicly available information and data. The likelihood of occurrence assessment has relied on database searches and publicly available information that relates to the referral area and broader locality. Field surveys focussed on verifying the vegetation and essential habitat mapped by the State Government and flora and fauna surveys targeting threatened species identified by database searches.

Targeted flora and fauna surveys were undertaken on 23 and 24 January 2020 (inclusive), during relatively warm conditions following seasonally high rainfall the week prior (16 – 22 January had 84.00 mm rain) (BOM 2020).

The field surveys only targeted those threatened species or communities, which have either been previously recorded or predicted to occur in the locality, and as such were assessed as having a moderate or high likelihood of occurring on the referral area.

Fauna surveys relied on passive methods for detection, such as call recognition, spotlighting, visual identification, motion detection cameras, active searches and inferential evidence of habitat usage (e.g. scratches, scats, burrows, active nests etc). No trapping was conducted as part of the fauna surveys, as the target species and degraded habitat values in the referral area did not justify the need for such surveys.



Legend

Referral Area

Figure 1

Site Context

SPRINGFIELD CITY GROUP

File ref. *7399 E Figure 1 Site Context B*
Date *2/03/2020*
Project *Peninsula Precinct*

0 0.5 1 2 km

N

Scale (A4): 1:50,000 [GDA 1994 MGA Z56]

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Legend

Referral Area

Qld DCDB

Figure 2

Site Aerial

SPRINGFIELD CITY GROUP

File ref. 7399 E Figure 2 Site Aerial B
Date 2/03/2020
Project Peninsula Precinct

0 25 50 100 150 200 *m*

N

Scale (A4): 1:4,500 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland (Department of Natural Resources, Mines and Energy) 2020, Aerial (Nearmap 2020)

2. Legislative Context

2.1. Commonwealth Legislation and Policy

2.1.1 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) establishes a requirement for Commonwealth environmental assessment and approval for actions that are likely to have a significant impact on any MNES protected under the EPBC Act, including:

- World heritage properties;
- National heritage places;
- Wetlands of international importance (listed under the Ramsar Convention);
- Listed threatened species and ecological communities;
- Migratory species protected under international agreements;
- Commonwealth marine areas;
- The Great Barrier Reef;
- Nuclear actions (including uranium mines); and
- A water resource, in relation to coal seam gas development and large coal mining development.

Other matters protected under the EPBC Act, include:

- The environment, where actions proposed are on, or will affect Commonwealth land and the environment; and
- The environment, where Commonwealth agencies are proposing to take an action.

When a proponent proposes to take an action that they believe may need approval under the EPBC Act, they must refer the proposed action to the Australian Government Minister for the Environment (the Minister). The purpose of the referral is to determine whether a proposed action is a 'controlled action' and thereby requires approval under the EPBC Act. If the Minister determines that a proposed action is a 'controlled action', it would then proceed through the Commonwealth assessment and approval process.

2.1.2 EPBC Act Environmental Offsets Policy

The *EPBC Act Environmental Offsets Policy* (2012) (EOP) outlines the Commonwealth Government's approach to the use of environmental offsets under the EPBC Act. The EOP applies to both project-by-project assessments and approvals under Part 8 and Part 9 of the EPBC Act.

The EOP provides a framework on the use of environmental offsets under the EPBC Act including when offsets are required, how offsets can be delivered, and the framework under which they operate. Offsets are not required for all approvals under the EPBC Act and the EOP is only triggered when significant residual impacts to matters protected under the EPBC Act are unavoidable. The EOP relates to all matters protected under the EPBC Act.

The EOP applies to offsetting requirements in both terrestrial and aquatic (including marine) environments. It requires that an environmental offset under the EPBC Act be suitable and *'delivers an overall conservation outcome that improves or maintains the viability of the protected matter(s)'*.

3. Methodology & Process

3.1. Desktop analysis methodology

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

- Commonwealth Matters of National Environmental Significance (MNES) protected under the EPBC Act on and around the site using the protected matters search tool with a 5 km radius (**Appendix A**);
- *Nature Conservation Act 1992* (NCA) listed threatened species on and around the site using the wildlife online database search tool with a 5 km radius (**Appendix B**);
- public environmental databases including Atlas of Living Australia, BioMaps and the Australian Koala Foundation (AKF); and
- regulated vegetation management and vegetation supporting maps under the *Vegetation Management Act 1999* (VMA).

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. A review of historical aerial imagery indicates that the property was historical utilised as part of the broader forestry practices throughout the Springfield area, but since 1980 has remained in a relatively natural state.

3.2. Likelihood of Occurrence Assessment

The likelihood of occurrence assessment was based upon publicly available species records and/or other information sources, such as field guides and web-based species profiles, including but not limited to:

- Commonwealth Government's *Species Profile and Threats Database* (SPRAT) for the threatened species and ecological communities listed under the EPBC Act; and
- The Queensland *Department of Environment and Science* (DES) threatened species website.

The likelihood of occurrence assessment was also informed by field survey results, including an appreciation and understanding of the species habitats within the referral area.

The likelihood of threatened species and ecological communities occurring in the referral area has been assessed against the criteria outlined in **Table 1**.

Table 1: Likelihood of occurrence assessment criteria

Likelihood of occurrence	Assessment criteria
Low	No previous records of the species within the locality and one or more of the following criteria is met: • Not previously recorded on the referral area and surrounds and the referral area is beyond the current known geographic range; • Dependant on specific habitat types or resources that are not present on the referral area; or • Considered extinct in the wild.
Moderate	Species previously recorded within the locality and one or more of the following criteria is met: • Previously recorded in proximity to the referral area (i.e. vagrant individuals); or • Potential habitat typologies or resources are present on the referral area.
High	Species previously recorded within the locality and one or more of the following criteria is met: • Previously recorded on the referral area; • Dependant on habitats or habitat resources that are available on the referral area; or • Suitable habitats are available on the referral area that are capable of supporting a resident population or individuals of the species.
Known	Flora species or ecological community positively identified during field surveys within the referral area. Fauna species positively recorded during field surveys within the referral area or adjacent habitats.

3.3. Field survey methodology

A field survey utilising the methods outlined in the following subsections was conducted to describe ecological value of the referral area.

3.3.1 Bird surveys

This technique is a non-intrusive active area search that provides a direct census of bird species occurrence and abundance. Inclement weather was avoided as this greatly reduces the detection of bird species.

Birds were surveyed across the referral area for a minimum of one-hour duration where possible, where two (2) survey were undertaken in the morning. This specific methodology was employed on 23 and 24 January 2020. Further observations were recorded over several hours during other survey activities including Fauna and flora meanders and opportunistic survey. Birds were identified from either direct observation or by their calls.

3.3.2 Modified Habitat Quality Assessment

The vegetation values of the referral area were assessed using the modified habitat quality assessment methodology. 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.



Photo 1: Transect 1 demonstrating the MHQA methodology

3.3.3 *Koala habitat and SAT surveys*

Surveys to understand Koala presence were undertaken across the referral area in accordance with the methodology developed by the Australian Koala Foundation[1] and specified in the *EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (hereby referred to as 'the Koala referral guideline'). The scat meander technique was utilised to identify the presence of Koala within the surrounding environment. Where scat or signs of Koala usage are identified during the scat meander, the Spot Assessment Technique (SAT) method was implemented. This methodology is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT method involves identifying a non-juvenile tree of any species within the referral area that is either observed to have a Koala or scats, or is known to be a Koala food tree or otherwise important for Koalas, and recording any evidence of Koala usage of that tree including physical presence, identifiable scratches or scats. The nearest non-juvenile tree is then identified and the same data recorded. The next closest non-juvenile tree to the first tree is then assessed and so on until 30 trees have been surveyed.

The number of trees showing evidence of Koala activity is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage. Assessment of each tree involves a systematic search for Koala scats beneath the tree within a 1 m radius of the trunk. After approximately two minutes of searching for scats, the base of the trunk is observed for scratches and the crown for Koala[1].

3.3.4 *Observational survey for significant flora and fauna, habitat trees and biodiversity values*

The referral area was walked several times 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.

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.

3.3.5 *Scats, tracks and other traces search*

Surveys for scats, tracks and other traces were conducted throughout the survey period during July 2019. Both predator and non-predator scats were sought during all searches. Only those samples definitively identified were included in the survey results. 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 notice of potential dens, scats and tracks for invasive species, such as European Red Fox and domestic cats, was taken to identify predator-prey interactions and understand existing impacts within the referral area.

---

[1] 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.

3.3.6 Fauna movement barrier assessment

A combination of contemporary aerial imagery, locality knowledge and field inspection can assist in understanding if there are barriers to fauna movement in the landscape. Once the aerial imagery is interrogated, location(s) for inspection are selected (typically roads) and barriers identified.



Photo 2: Springfield trunk sewer upgrade occurring within and adjacent to the referral area.

4. Results

4.1. Desktop Assessment

4.1.1 Landscape Context and Historical Aerial Imagery

The referral area is located in a landscape that has historically supported similar land uses (refer to Error! Reference source not found.**Plan 1** for historical aerial imagery analysis), however, the landscape has rapidly evolved since the inception of the Springfield Master Plan area. Although the site retains native vegetation, the larger tract of vegetation in which the site comprises has been subject to historic and ongoing vegetation clearing associated with residential development.

Connectivity towards the south and west is limited by major arterial roads and large-scale residential development. The development to the west is associated with a current EPBC approval (EPBC2016/7676). The site retains connectivity to the north and east, with the site adjoining existing known koala habitat on the Opossum Creek and Mountain Creek corridors and vacant bushland to the north. Currently, the site is connected to approximately 675 ha.

4.1.2 Matters of National Environmental Significance

Based upon the database searches and the findings of the desktop assessment, the only MNES identified as being of potential relevance to the Project, include threatened flora and fauna species and migratory fauna species.

4.1.3 EPBC Act Threatened Ecological Communities

The Protected Matters Search Tool (PMST) (refer **Appendix A)** returned the following four (4) threatened ecological communities (TEC), listed under the EPBC Act, as having potential to occur within 5 km of the referral area:

- Coastal Swamp Oak (*Casuarina glauca)* Forest of New South Wales and South East Queensland ecological community
- Lowland Rainforest of Subtropical Australia
- Poplar Box Grassy Woodland on Alluvial Plains
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

The likelihood of occurrence for each TEC within the referral area, as presented in **Table 2**, referred to State Government regional ecosystem mapping within the Locality and known distributions of the TECs, to identify those TECs with potential to occur in the referral area or recorded during field surveys.

The results of the likelihood of occurrence assessment determined that no TECs listed above have the potential to occur within the referral area. Field verification surveys confirmed that no TECs are present on the referral area.

Table 2: Likelihood of occurrence of TECs within referral area

TEC	EPBC Act status	Desktop Likelihood of Occurrence
Coastal Swamp Oak (*Casuarina glauca)* Forest of New South Wales and South East Queensland ecological community	Endangered	**Low** No species representing these characteristics or vegetation communities were observed within the assessment area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community.
Lowland Rainforest of Subtropical Australia	Critically Endangered	**Low** No species representing these characteristics or vegetation communities were observed within the referral area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community.
Poplar Box Grassy Woodland on Alluvial Plains	Critically Endangered	**Low** No species representing these characteristics or vegetation communities were observed within the referral area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	**Low** No Characteristics or species representing this community were observed on or within the immediate vicinity of this site.

4.1.4 Threatened Flora Species

Database searches returned sixteen (16) flora species, listed as threatened under the EPBC Act and/or NC Act, as having being previously recorded or predicted to occur within 5 km of the referral area, as presented in **Appendix A.**

Based on the presence of species records within the locality and the habitats within the referral area, a likelihood of occurrence assessment was conducted to determine those threatened flora species with potential to occur within the referral area. The assessment identified that one (1) threatened flora species had a moderate likelihood of occurring on the referral area. All other threatened flora species were assessed as having a low likelihood of occurring.

Table 3: Likelihood of occurrence of fauna species within referral area

Species	EPBC/ NC Act status	Desktop Likelihood of Occurrence
Coleus habrophyllus	Endangered	**Moderate** This species requires niche habitat requirements such a rocky outcrop, limited to no weeds, a relatively undisturbed understorey and shaded location. The population situated on Mountain Creek to the south of the referral area is located on a rocky outcrop facing south-east and contains limited to no weed incursion.

The complete likelihood of occurrence assessment is presented in **Appendix C**.

4.1.5 Threatened Fauna Species

Database searches returned thirty (30) fauna species listened as threatened under the EPBC Act and/or NC Act, as having been previously recorded or predicted to occur within 5 km of the referral area.

Based on the presence of species records within the locality and the habitats identified within the referral area, a likelihood of occurrence assessment was conducted to determine those threatened species with potential to occur within the referral area. The likelihood of occurrence assessment determined five (5) threatened fauna species listed under the EPBC Act and/or NC Act, as having a moderate or higher likelihood of occurring on the referral area. These species are outlined in **Table 4** below. All other threatened and/or migratory fauna species were assessed as having a low likelihood of occurring.

Table 4: Likelihood of occurrence of fauna species within referral area

Species	EPBC/ NC Act status	Desktop Likelihood of Occurrence
Anthochaera phrygia (Regent Honeyeater)	Critically Endangered	**High** Suitable foraging habitat for the Regent Honeyeater occurs on and adjacent to the referral area. The referral area and adjoining Opossum Creek corridor are dominated by regional ecosystems which contain suitable species to support the Regent Honeyeater. This species has been sighted recently in the Springfield Lakes area and as a result there is a potential for this species to opportunistically forage on-site.
Lathamus discolour (Swift Parrot)	Critically Endangered	**High** Suitable foraging habitat for the Swift Parrot occurs on and adjacent to the referral area. The referral area and adjoining Opossum Creek corridor are dominated by regional ecosystems which contain suitable species to support the Swift Parrot. This species has been sighted recently in the Springfield Lakes area and as a result there is a potential for this species to opportunistically forage on-site.
Petauroides volans (Greater Glider)	Vulnerable	**Moderate** A variety of eucalypt species occur over site, however, given the historical logging activities of the site, it is unlikely that the site contains a suitable hollow density to support a greater glider population. It should be noted that WildNet records indicate this species has been sighted previously in the Springfield Lakes area.
Phascolarctos cinereus (Koala)	Vulnerable	**Known** Suitable Koala habitat is present on-site and Koalas have been known to occur within close proximity to the site.
Pteropus poliocephalus (Grey-headed Flying Fox)	Vulnerable	**High** Suitable foraging habitat occurs on-site and the nearest known roost site located in Pilney Reserve (Barbara Street), 3.6 km north-east.

The complete likelihood of occurrence assessment is presented in **Appendix C.**

4.1.6 *Migratory Species*

Database searches returned seventeen (17) migratory fauna species listened as threatened under the EPBC Act and/or NC Act, as having been previously recorded or predicted to occur within 5 km of the Referral area.

Based on the presence of species records within the locality and the habitats identified within the referral area, a likelihood of occurrence assessment was conducted to determine those threatened species with potential to occur within the referral area. The likelihood of occurrence assessment determined that two (2) threatened migratory fauna species listed under the EPBC Act and/or NC Act as having a moderate likelihood of occurring in the referral area. These species being, *Rhipidura rufifrons* (Rufous Fantail) and *Hirundapus caudacutus* (White-throated Needletail). All other threatened and/or migratory fauna species were assessed as having a low likelihood of occurring.

The complete likelihood of occurrence assessment is presented in **Appendix C.**

4.1.7 *State Mapped Regulated Vegetation and Essential Habitat*

A desktop review of the Queensland 'Regulated Vegetation Management Mapping' was conducted, focusing on the referral area. This analysis indicated that the referral area contains a two (2) polygons of State mapped regulated vegetation (regional ecosystem), as outlined in **Table 5** and presented in **Figure 3** and **Figure 4.**

Table 5: State mapped regulated vegetation (regional ecosystem) within the referral area

Regional Ecosystem	Short Description	VM Act Status	Extent on the referral area (ha)
Remnant & Regrowth			
12.9-10.2/12.9-10.7/12.9-10.19	*12.9-10.2: Corymbia citriodora subsp. variegata +/- Eucalyptus crebra open forest on sedimentary rocks.* *12.9-10.7: Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora spp., E. melanophloia woodland on sedimentary rocks.* *12.9-10.19: 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.*	Of Concern	16.38 ha
12.3.11	*Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast.*	Of Concern	2.52 ha
Non-remnant	Cleared land	-	0.00 ha
		Total	**18.90 ha**



Legend

- Referral Area
- Qld DCDB

Regulated Vegetation

- Category A area - *Vegetation Offset/Compliance notices/VDecs*
- Category B area - *Remnant vegetation*
- Category C area - *High value regrowth vegetation*
- Category R area - *Reef regrowth watercourse vegetation*
- Category X area - *Vegetation not regulated under the VMA*
- Water
- Area not categorised

Figure 3

Regulated Vegetation Management Map

File ref. *7399 E Figure 3 RVMM B*
Date *2/03/2020*
Project *Peninsula Precinct*

0 25 50 100 150 200 m

N

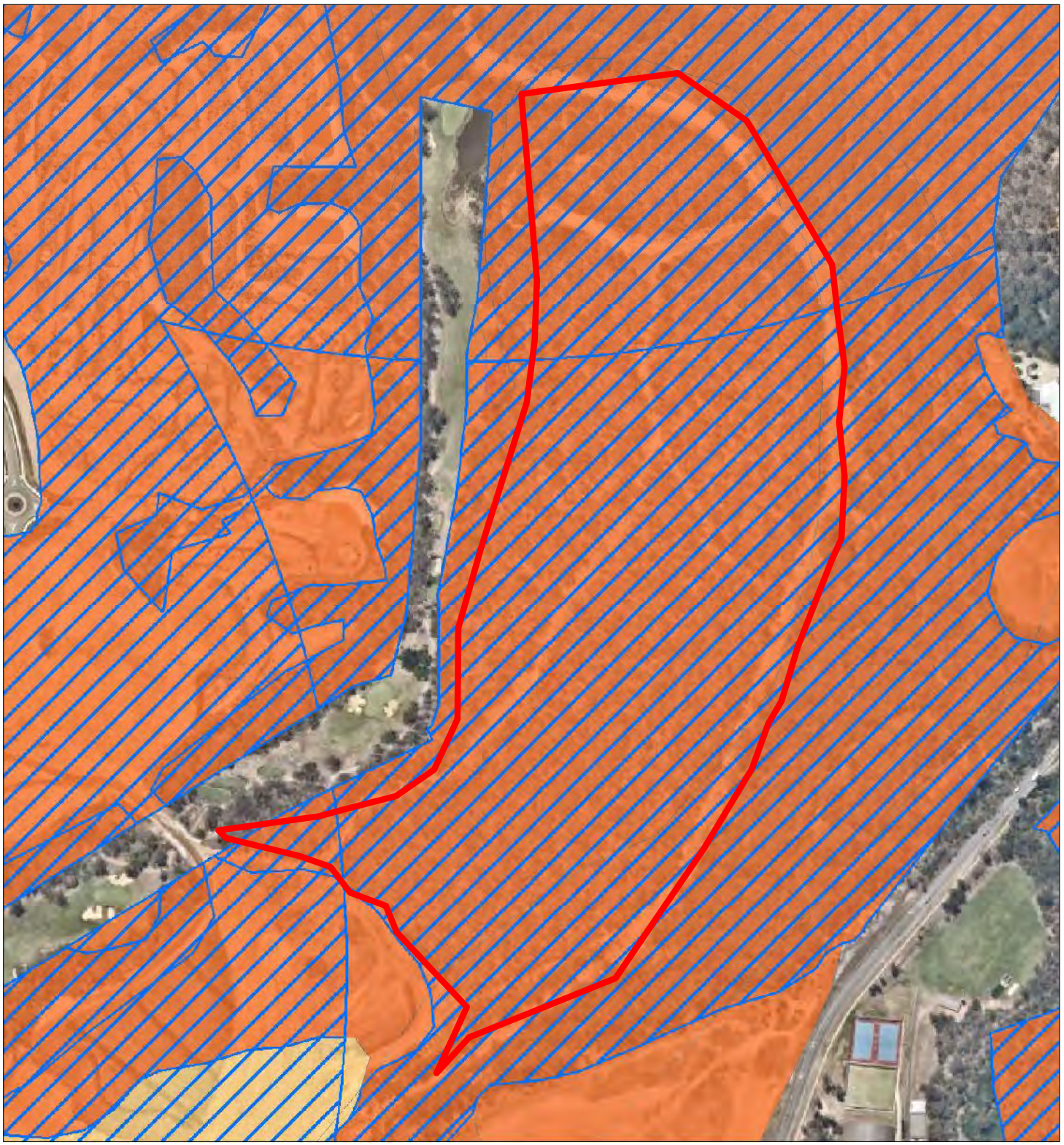
Scale (A4): 1:4,500 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland (Department of Natural Resources, Mines and Energy) 2020, Aerial (Nearmap 2020)



Legend

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

Regional Ecosystems mapping

- 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 4

Regulated Vegetation Supporting Map

File ref. *7399 E Figure 4 RVSM B*
Date *2/03/2020*
Project *Peninsula Precinct*

0 25 50 100 150 200 m

N

Scale (A4): 1:4,500 [GDA 1994 MGA Z56]

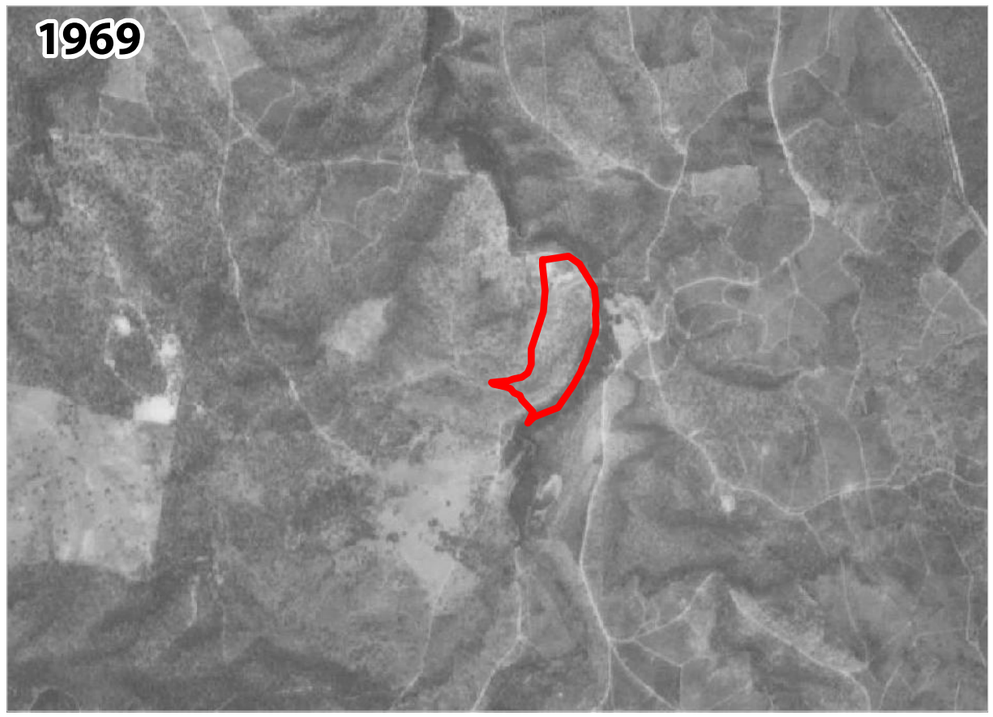
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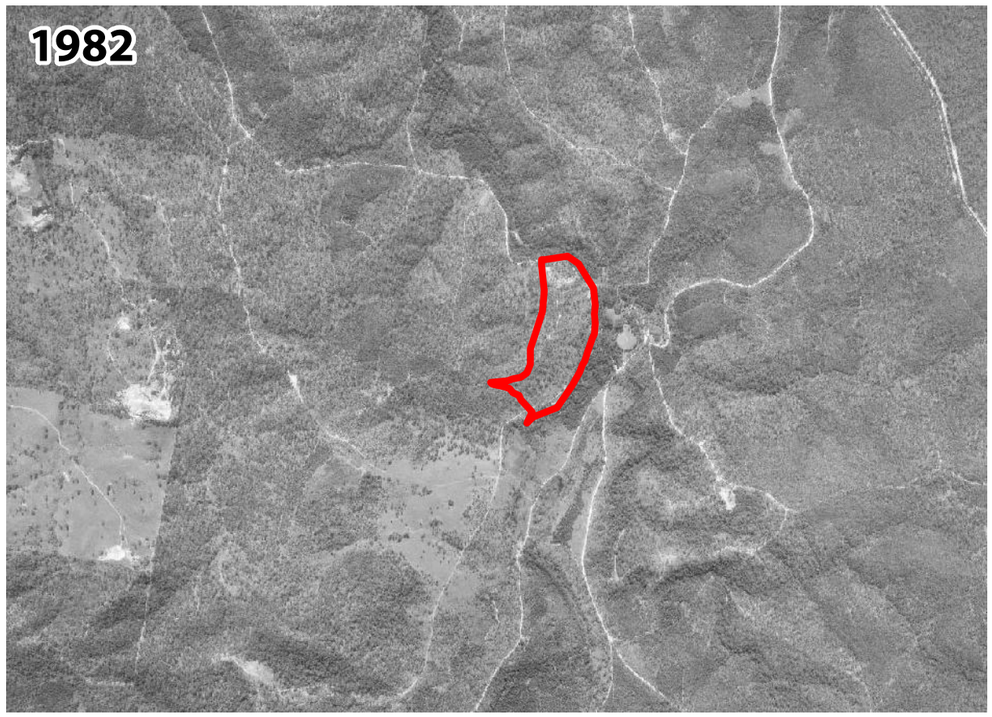
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1. Historic Aerial Imagery









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Legend

Referral Area

Issue	Date	Description	Drawn	Checked
A	2/03/2020	Preliminary	MP	JG

0 150 300 600 900 1,200 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:30,000 @ A3

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Peninsula Precinct

ADDRESS/RPD: Eden Station Drive, Brookwater *2/03/2020* *7399 E 01 Historical Imagery A*

4.2. Field Assessment

The results of the flora and fauna surveys, and likelihood of occurrence, enables an understanding of the ecological constraints and potential impacts to MNES associated with the Project as concept design, and what is to be considered during the detailed design phases of the Project.

The results of the targeted vegetation, flora and fauna surveys, is presented within the following sections. Refer to **Plan 2** for the field survey effort undertaken across the referral area and surrounding locality.

4.2.1 Ecological context of referral area

The referral area is located in a landscape that has historically supported similar land uses (refer to **Plan 1** Error! Reference source not found.for historical aerial imagery analysis), however, the landscape has rapidly evolved since the inception of the Springfield Master Plan area. Although the site retains native vegetation, the larger tract of vegetation in which the site comprises has been subject to historic and ongoing vegetation clearing associated with residential development. Due to the surrounding urban development, the site retains limited biodiversity values and is contains a relatively degraded ground cover which is dominated by weeds. Further, the installation of the Springfield trunk sewer has resulted in an area fragmented by linear infrastructure.

The vegetation on-site is considered to be accurately mapped as 'remnant' vegetation due to the cessation of logging activities. The 'remnant' Category B vegetation communities contain species consistent of the mapped regional ecosystems, being RE12.9-10.2 and RE12.3.11. The canopy height and coverage of the vegetation communities is consistent with the remnant status definition for RE12.9-10.2 and RE12.3.11.

The referral area is bound by Mountain Creek and Opossum Creek to the east and north-east which provides an effective fauna movement corridor. The Opossum Creek corridor is a 100-150 m creek corridor which provides lateral fauna movement to the Flinders Karawatha Corridor to the east and existing vacant bushland to the north-west.

Connectivity towards the south and west is limited by major arterial roads and large-scale residential development. The development to the west is associated with a current EPBC approval (EPBC2016/7676). The site retains connectivity to the north and east, with the site adjoining existing known koala habitat on the Opossum Creek and Mountain Creek corridors and vacant bushland to the north. Currently, the site is connected to approximately 675 ha.

4.2.2 EPBC Act Threatened Ecological Communities

As outlined in **Section 4.1.3**, The Protected Matters Search Tool (PMST) (refer **Appendix A**) returned the following four (4) threatened ecological communities (TECs), listed under the EPBC Act, as having potential to occur within 5 km of the Referral area:

- Coastal Swamp Oak (*Casuarina glauca)* Forest of New South Wales and South East Queensland ecological community
- Lowland Rainforest of Subtropical Australia
- Poplar Box Grassy Woodland on Alluvial Plains
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

The likelihood of occurrence for each TEC within the referral area, as presented in **Table 2**, referred to State Government regional ecosystem mapping within the locality and known distributions of the TECs, to identify those

TECs with potential to occur in the referral area or recorded during field surveys. The results of the likelihood of occurrence assessment determined that no TECs listed above have the potential to occur within the referral area. Field verification surveys confirmed that no TECs are present on the referral area.

4.2.3 Habitat Assessment and Vegetation Communities

The following section discusses the results of the field verification surveys of vegetation communities and regional ecosystems within the 18.90 ha referral area.

Field survey confirmed that the referral area contains predominantly remnant vegetation, excluding the internal tracks and more recent Springfield trunk sewer construction easement. The vegetation on-site is considered to be accurately mapped as 'remnant' vegetation due to the cessation of logging activities. The 'remnant' Category B vegetation communities contain species consistent of the mapped regional ecosystems, being RE12.9-10.2 and RE12.3.11.

The 'remnant' RE12.9-10.2 vegetation community was dominated by *Corymbia citriodora* (Spotted Gum) with associated canopy species including *Eucalyptus crebra* (Narrow-leaved Ironbark), *Eucalyptus moluccana* (Gum-topped Box) and *Eucalyptus fibrosa* (Broad-leaved Ironbark). The understorey was dominated by regrowth *Acacia spp.* and *Alphitonia excelsa* (Soap Tree), while the groundcover contained an abundance of leaf litter and isolated areas of *Lantana camara* infestations. The canopy height and coverage of the mapped 'remnant' RE12.9-10.2 is consistent with the remnant status definition.

The 'remnant' RE12.3.11 vegetation community was dominated by *Eucalyptus grandis* (Flooded Gum) with associated canopy species including *Corymbia intermedia* (Pink Bloodwood), *Lophostemon suaveolens* (Swamp Box) and *Corymbia tesselaris* (Moreton Bay Ash). The understorey was dominated by *Celtis sinensis* (Chinese Elm) and *Cinnamomum camphora* (Camphor Laurel) with scattered native species including *Lophostemon confertus* (Brush Box), *Acacia spp.* and *Leptospermum liversidgei* (Lemon-scented Tea-tree). The groundcover was dominated by *Lantana camara* (Lantana) with limited to no native grass or forb cover. The canopy height and coverage of the mapped 'remnant' RE12.3.11 is consistent with the remnant status definition.

The location and extent of the field verified vegetation communities is depicted in **Plan 3**.

4.2.4 Connectivity

Connectivity towards the south and west is limited by major arterial roads and large-scale residential development. The development to the west is associated with a current EPBC approval (EPBC2016/7676).

The site retains connectivity to the north and east, with the site adjoining existing known koala habitat on the Opossum Creek and Mountain Creek corridors and vacant bushland to the north. Currently, the site is connected to approximately 675 ha.

Refer to **Plan 5** for detailed connectivity analysis.

4.2.5 *Threatened Flora Species*

A total of one-hundred and four (104) flora species were recorded within the vegetation communities during field surveys, as listed in **Appendix E. No flora species listed under the EPBC Act and NC Act were recorded in the referral area.**

Threatened species meanders were conducted to identify species specific habitat niches for *Coleus habrophyllus* (Plectranthus), however, surveys failed to yield appropriate habitat conditions such as rocky outcrops with a south-south-east aspect and undisturbed understorey.

Of the 104-flora species recorded, forty-five (45) species are considered to be non-native introduced species. Refer to **Appendix E** for the complete flora list and native / non-native designation.

4.2.6 *Threatened Fauna Species*

Database searches returned twenty-six (26) fauna species listened as threatened under the EPBC Act and/or NC Act, as having been previously recorded or predicted to occur within 5 km of the referral area. Of the twenty-six (26) identified fauna species, five (5) were assigned a moderate or greater likelihood of occurring on site. These species include, Koala, Grey-headed Flying-fox, Swift Parrot, Regent Honeyeater and Greater Glider.

Koala (*Phascolarctos cinereus*)

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

Surveys of Koala utilisation of the site were conducted across the referral area to determine the likelihood of occurrence throughout the entire extent, and identify whether there was any concentrated occurrence. Five (5) Koala SAT surveys were conducted (refer **Plan 3**). **Table 6** presents the Koala usage scores for the five (5) SAT surveys completed. Refer to **Appendix D** for the raw SAT survey data.

Table 6: Summary of SAT Results

SAT Site Number	Evidence of Koala Use (%)	East Coast (Med-High) Koala Use (High/Medium/Low)
1	0.00 %	Nil
2	0.00 %	Nil
3	6.66 %	Low
4	0.00 %	Nil
5	0.00 %	Nil

The Australian Koala Foundation koala activity level classification table (following Philips and Callaghan 2011) provides an estimate of koala utilisation based on defined Activity Categories. The East Coast (med-high) Activity Category is appropriate for the referral area. The evidence suggests that while the referral area is utilised by Koalas, it is considered relatively poor habitat for the species. The relatively low levels of koala usage at the site may be a result of major changes in the immediate landscape including historical land clearing and rapid urbanisation following the approval of the Springfield Structure Plan area.

Opportunistic searches for Koalas were also undertaken as part of the field survey effort. No direct evidence of Koalas was documented on-site.

Grey-headed Flying-fox

Pteropus poliocephalus (Grey-headed Flying-fox) requires foraging resources and roosting sites to persist. The species is known to use a wide variety of habitats including subtropical and temperate rainforests, tall sclerophyll forest and woodlands, heaths, swamps and also urban and agricultural areas where food trees have been cultivated.

The species is highly adaptive with its diverse native diet, which it can supplement with introduced species. It is known to forage within a variety of habitat areas as each resource does not produce food throughout the entire year. The closest active GHFF roost is approximately 3.9 km north of the site, being Barbara St, Camira (140), while the nearest roost with greater than 2,500 GHFFs is located approximately 13 km north-east on Avondale Crescent, Parkinson. Opportunistic and targeted surveys did not locate roosting sites on the referral area or within the immediate vicinity of the site. No Grey-headed Flying-fox individuals were recorded during field surveys.

It is noted that foraging habitat for the Grey-headed Flying-fox is analogous with habitat for the Koala.

Swift Parrot (*Lathamus discolor*)

The Swift Parrot breeds in Tasmania during the austral summer and the entire population migrates north to mainland Australia for the austral winter. 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.

The species was not identified on-site during field survey events; however, suitable foraging habitat was noted within the referral area, with species such as *Corymbia citriodora, Eucalyptus robusta* and *Eucalyptus tereticornis* all recorded on-site. It should be noted that detailed habitat quality transects concluded that the vegetation on-site meets the definition of 'remnant', however, due to historical logging activities, large trees were predominantly absent. Analysis of the data indicates that six (6) trees per hectare were equal to or greater than the large tree benchmark (380 mm DBH) for the 'remnant' RE12.9-10.2 vegetation community. The benchmark large trees per hectare the 'remnant' RE12.9-10.2 as per the Queensland Herbarium Benchmark guideline is 38 trees per hectare. As such, the 'remnant' RE12.9-10.2 vegetation community within the referral area meets 7.89 % of the large tree benchmark for the regional ecosystem. This data indicates that although the vegetation community on-site contains potential foraging species for the Swift Parrot, the preferential of the specie to forage in large, mature trees therefore limits the availability of preferred habitat on-site.

Further, given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site (Greenbank Military Base located within the Flinders-Karawatha Corridor), the significance of the 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"*. Review of the *Vegetation Management Act 1999* Vegetation Management Report indicates that the referral area does not contain essential habitat for the Swift Parrot, whereas, this is not the case for the Greenbank Military Base.

Regent Honeyeater (*Anthochaera phrygia*)
The Regent Honeyeater has an extremely patchy distribution, with a small number of known breeding sites. Regent Honeyeaters are known to use different areas in different years depending on food resources, with research also indicating that they may travel large distances. Most Regent Honeyeater records have been derived from box-ironbark eucalypt associations, where the bird seems to prefer more fertile sites with higher soil water content, including creek flats, broad river valleys and lower slopes. 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 prefers large trees which flower consistently.

The species was not identified on-site during field survey events; however, suitable foraging habitat was noted within the referral area, with species such as *Corymbia citriodora* and *Eucalyptus robusta* recorded on-site. It should be noted that detailed habitat quality transects concluded that the vegetation on-site meets the definition of 'remnant', however, due to historical logging activities, large trees were predominantly absent. Analysis of the data indicates that six (6) trees per hectare were equal to or greater than the large tree benchmark (380 mm DBH) for the 'remnant' RE12.9-10.2 vegetation community. The benchmark large trees per hectare the 'remnant' RE12.9-10.2 as per the Queensland Herbarium Benchmark guideline is 38 trees per hectare. As such, the 'remnant' RE12.9-10.2 vegetation community within the referral area meets 7.89 % of the large tree benchmark for the regional ecosystem. This data indicates that although the vegetation community on-site contains potential foraging species for the Regent Honeyeater, the preferential of the specie to forage in large, mature trees therefore limits the availability of preferred habitat on-site. Further, given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site (Greenbank Military Base located within the Flinders-Karawatha Corridor), the significance of the foraging habitat on-site is considered marginal.

A total of 23 fauna species were recorded during the field survey, including 20 birds and three (3) mammals. Indirect evidence of Koala usage was identified on-site in the form of scats. No fauna species of conservation significance were directly recorded during the field survey.

A complete fauna species list is provided in **Appendix E.**

4.2.7 Migratory Species

Database searches returned seventeen (17) migratory fauna species listed as threatened under the EPBC Act and/or NC Act, as having been previously recorded or predicted to occur within 5 km of the referral area. Following the likelihood of occurrence assessment, only one species was identified as having a moderate likelihood of occurring onsite, this being the Rufous Fantail. No migratory fauna species of conservation significance were recorded during the field survey.

A complete fauna species list is provided in **Appendix E.**

2. Field Survey Effort



NOTES
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Aerial Imagery © Nearmap, 2020

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Legend

- Referral Area
- Qld DCDB
- Habitat transects
- Photo location 2020
- SAT Survey
- GPS Tracklog

Issue	Date	Description	Drawn	Checked
A	18/06/2013	Preliminary	TC	RM
B	2/03/2020	Preliminary	MP	JG

0 10 20 40 60 80 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:3,000 @ A3

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Peninsula Precinct

ADDRESS/RPD: Eden Station Drive, Brookwater *2/03/2020* *7399 E 02 Field Survey Effort B*

3. Vegetation Communities



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Legend

- Referral Area
- Qld DCDB

Vegetation Communities

- RE 12.3.11 (1.84 ha)
- RE 12.9-10.2/12.9-10.7/12.9-10.19 (17.03 ha)

Issue	Date	Description	Drawn	Checked
A	2/03/2020	Preliminary	MP	JG

0 10 20 40 60 80 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:3,000 @ A3

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ADDRESS/RPD: Eden Station Drive, Brookwater *2/03/2020* *7399 E 03 Vegetation Communities A*

4.3. Likelihood of Occurrence

The likelihood of occurrence assessment was initially conducted prior to conducting field surveys to identify the MNES (threatened ecological communities and threatened and/or migratory species) of potential relevance to the referral area. The identified MNES were then the focus of the field survey program and effort.

Subsequent to completing the field survey, the likelihood of occurrence was revised and finalised, based on field survey results and the confirmed vegetation communities and associated habitats contained with the referral area. The outcome of this two-staged likelihood of occurrence is presented in the following sections.

Those matters with a moderate or high likelihood of occurrence proceed to the impact assessment presented in **Section 5.**

Based upon the database searches and the findings of the desktop assessment, the only MNES identified as being of potential relevance to the Project, include threatened ecological communities, threatened flora and fauna species, and migratory fauna species.

4.3.1 EPBC Act Threatened Ecological Communities

The likelihood of occurrence for each TEC within the referral area, as presented in **Table 2**, referred to State Government regional ecosystem mapping within the locality and known distributions of the TECs, to identifies those TEC's with potential to occur in the referral area or recorded during field surveys.

The Protected Matters Search Tool (PMST) (refer **Appendix A**) returned the following four (4) threatened ecological communities (TEC), listed under the EPBC Act, as having potential to occur within 5 km of the referral area:

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community
- Lowland Rainforest of Subtropical Australia
- Poplar Box Grassy Woodland on Alluvial Plains
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

The results of the likelihood of occurrence assessment determined that none of the above-mentioned TECs were likely to occur due to the absence of regional ecosystems and species on site typically associated with these TECs. **Field surveys confirmed no TEC's were present within the referral area.**

4.3.2 Threatened Flora Species

Database searches returned fifteen (15) flora species, listed as threatened under the EPBC Act and four (4) under the NCA Act as having been previously recorded or predicted to occur within 5 km of the referral area, as presented in **Appendix A.**

Based on the presence of species records within the locality and the habitats within the referral area, a likelihood of occurrence assessment was conducted to determine those threatened flora species with potential to occur within the referral area. The assessment identified that fourteen (14) of the listed threatened flora species had a low risk of impact on site due to being unlikely to occur in the referral area. *Coleus habrophyllus* which is listed as Endangered

under the EPBC Act was identified as having moderate risk of occurrence on the site due to previous records of the species proximal to the site.

Detailed field surveys failed to yield evidence of niche habitat features such as rocky outcrops with a south-south-east facing slope. Further, the Mountain Creek and Opossum Creek corridor are heavily weed infested by *Lantana camara*, impacting the viability of *Coleus habrophyllus* to persist in the area. As such, **field surveys confirmed that no EPBC listed flora species were present within the referral area.**

Table 7: Field Assessment Confirmed Likelihood of Occurrence – Threatened Flora

Species	EPBC/ NC Act status	Desktop Likelihood of Occurrence	Field Assessment Confirmed Likelihood of Occurrence
Coleus habrophyllus	Endangered	**Moderate** This species requires niche habitat requirements such a rocky outcrop, limited to no weeds, a relatively undisturbed understorey and shaded location. The population situated on Mountain Creek to the south of the referral area is located on a rocky outcrop facing south-east and contains limited to no weed incursion.	**Low** This species requires niche habitat requirements such a rocky outcrop, limited to no weeds, a relatively undisturbed understorey and shaded location. The population situated on Mountain Creek to the south of the referral area is located on a rocky outcrop facing south-east and contains limited to no weed incursion. Detailed field surveys failed to yield evidence of niche habitat features such as rocky outcrops with a south-south-east facing slope. Further, the Mountain Creek and Opossum Creek corridor are heavily weed infested by *Lantana camara*, impacting the viability of *Coleus habrophyllus* to persist in the area.

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

4.3.3 Threatened Fauna Species

Database searches returned twenty-six (26) fauna species, listed as threatened under the EPBC Act and nine (9) listed under the NCA Act, as having been previously recorded or predicted to occur within 5 km of the referral area, as presented in **Appendix A.**

Based on the presence of species records within the locality and the habitats within the referral area, a likelihood of occurrence assessment was conducted to determine those threatened fauna species with potential to occur within the referral area. The assessment identified that five (5) threatened fauna species had a moderate or high likelihood or occurring on-site. The Koala was identified as being known to occur on the site as it has been recorded during field surveys.

Table 8: Field Assessment Confirmed Likelihood of Occurrence – Threatened Fauna

Species	EPBC/ NC Act status	Desktop Likelihood of Occurrence	Field Assessment Confirmed Likelihood of Occurrence
Anthochaera phrygia (Regent Honeyeater)	Critically Endangered	**High** Suitable foraging habitat for the Regent Honeyeater occurs on and adjacent to the referral area. The referral area and adjoining Opossum Creek corridor are dominated by regional ecosystems which contain suitable species to support the Regent Honeyeater. This species has been sighted recently in the Springfield Lakes area and as a result there is a potential for this species to opportunistically forage on-site.	**High** Suitable foraging habitat for the Swift Parrot occurs on and adjacent to the referral area. The referral area is dominated by *Corymbia citriodora* (Spotted Gum), while, the Opossum Creek corridor contains a more prominent abundance of suitable species such as *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus grandis* (Flooded Gum). This species has been sighted recently in the Springfield Lakes area, however was not identified during detailed field surveys.
Lathamus discolour (Swift Parrot)	Critically Endangered	**High** Suitable foraging habitat for the Swift Parrot occurs on and adjacent to the referral area. The referral area and adjoining Opossum Creek corridor are dominated by regional ecosystems which contain suitable species to support the Swift Parrot. This species has been sighted recently in the Springfield Lakes area and as a result there is a potential for this species to opportunistically forage on-site.	**High** Suitable foraging habitat for the Swift Parrot occurs on and adjacent to the referral area. The referral area is dominated by *Corymbia citriodora* (Spotted Gum), while, the Opossum Creek corridor contains a more prominent abundance of suitable species such as *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus grandis* (Flooded Gum). This species has been sighted recently in the Springfield Lakes area, however was not identified during detailed field surveys.
Petauroides volans (Greater Glider)	Vulnerable	**Moderate** A variety of eucalypt species occur over site, however, given the historical logging activities of the site, it is unlikely that the site contains a suitable hollow density to support a greater glider population. It should be noted that WildNet records indicate this species has been sighted previously in the Springfield Lakes area.	**Low** A variety of eucalypt species occur across the referral area, however, due to historical logging activities, the site contains a lack of hollow bearing trees. Although the vegetation meets remnant status, the maturity of the vegetation is not yet at a stage to support such species.
Phascolarctos cinereus (Koala)	Vulnerable	**Known** Suitable Koala habitat is present on-site and Koalas have been known to occur within close proximity to the site.	**Known** Suitable Koala habitat is present on-site and Koalas have been known to occur within close proximity to the site. No direct Koala observations were documented during field surveys, however, indirect

			observations in the form of scats was identified.
Pteropus poliocephalus (Grey-headed Flying Fox)	Vulnerable	**High** Suitable foraging habitat occurs on-site and the nearest known roost site located in Pilney Reserve (Barbara Street), 3.6 km north-east.	**High** While suitable foraging vegetation occurs on-site, the species was not seen utilising this vegetation. In addition, there was no observed roosts on site, with the nearest known roost site located in Pilney Reserve (Barbara Street), 3.6 km north-east.

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

4.3.4 Migratory Species

Database searches returned seventeen (17) migratory species, listed as threatened under the EPBC Act and/or NCA Act, as having been previously recorded or predicted to occur within 5 km of the referral area, as presented in **Appendix A.**

Based on the presence of species records within the locality and the habitats within the referral area, a likelihood of occurrence assessment was conducted to determine those threatened migratory species with potential to occur within the referral area. The assessment identified that two (2) threatened migratory species have a moderate potential of occurring on site, being the Rufous Fantail and White-throated Needletail. All other species were considered to have a low risk of being impacted by the proposed development as they were considered unlikely to occur on site.

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

5. Impact Assessment

5.1. Potential Project Related Impacts

The Project (master-planned Town Centre community) will be entirely located within the referral area, with the clearing of all native vegetation within this area necessary to facilitate the mixed precinct comprising of Town Business, Retail, Education and Town Residential Precincts.

5.1.1 Impact Avoidance and Minimisation

The layout and design of the master-planned Town Centre community avoids impacts on the Opossum Creek corridor and Mountain Creek corridor by providing suitable buffers the movement corridors, which were identified as containing the highest ecological value on the referral area. It is important to note that no significant or unique ecological or connectivity values were identified on site during the site survey.

5.1.2 Potential Direct Impacts

Vegetation Clearing

The project is predicted to directly impact the entirety of the referral area, with no direct or indirect impacts assumed to occur on the adjoining Opossum Creek corridor.

Table 9: Potential direct impacts to field verified vegetation communities

Regional Ecosystem	Short Description	VM Act Status	Extent on the referral area (ha)	Impact (ha)
Remnant & Regrowth				
12.9-10.2/12.9-10.7/12.9-10.19	*12.9-10.2: Corymbia citriodora subsp. variegata +/- Eucalyptus crebra open forest on sedimentary rocks.* *12.9-10.7: Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora spp., E. melanophloia woodland on sedimentary rocks.* *12.9-10.19: 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.*	Of Concern	16.067 ha	16.067 ha
12.3.11	*Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia open forest on alluvial plains usually near coast.*	Of Concern	1.013 ha	1.013 ha

Non-remnant	Cleared land	-	1.82ha	1.82 ha
		Total	**18.90 ha**	**18.90 ha**

Habitat Loss

The Project is predicted to impact remnant habitat, which provides marginal habitat values for a range of native flora and fauna species.

The MNES identified as having a moderate and higher likelihood of occurrence have been further assessed in terms of the risk of potential project related impacts upon each matter, to determine the need or otherwise for EPBC Act significant impact assessments to be completed, as presented in **Table 10**.

The risk of impact assessment (refer to **Table 10**) is qualitative and based upon the potential extent of habitat loss resulting from the construction phase of the Project and to a lesser degree the operational phase of the Project. It considered, but was not limited to the following:

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

Table 10: Threatened fauna and migratory fauna species listed under the EPBC Act, with a moderate or greater likelihood of occurring in the referral area post field survey analysis, and risk of impact assessment

Scientific Name	Common Name	EPBC Act Status	Likelihood of Occurrence	Risk of Impact
Threatened fauna species				
Phascolarctos cinereus	Koala	Vulnerable	**Known** Suitable Koala habitat is present on-site and Koalas have been known to occur within close proximity to the site. No direct Koala observations were documented during field surveys, however, indirect observations in the form of scats was identified.	**Yes**
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	**High** While suitable foraging vegetation occurs on-site, the species was not seen utilising this vegetation. In addition, there was no observed roosts on site, with the nearest known roost site located in Pilney Reserve (Barbara Street), 3.6 km north-east.	**No**
Lathamus discolor	Swift Parrot	Critically Endangered	**High** Suitable foraging habitat for the Swift Parrot occurs on and adjacent to the referral area. The referral area is dominated by *Corymbia citriodora* (Spotted Gum), while, the Opossum Creek corridor contains a more prominent abundance of suitable species such as *Eucalyptus crebra* (Narrow-leaved Ironbark) and	**No**

			Eucalyptus grandis (Flooded Gum). This species has been sighted recently in the Springfield Lakes area, however was not identified during detailed field surveys.	
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	**High** Suitable foraging habitat for the Swift Parrot occurs on and adjacent to the referral area. The referral area is dominated by *Corymbia citriodora* (Spotted Gum), while, the Opossum Creek corridor contains a more prominent abundance of suitable species such as *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus grandis* (Flooded Gum). This species has been sighted recently in the Springfield Lakes area, however was not identified during detailed field surveys.	**No**
Threatened migratory fauna species				
Rhipidura rufifrons	Rufous Fantail	Migratory Terrestrial Species/Marine Species	**Moderate** WildNet records indicate species has been previously observed in Springfield Lakes area.	**No**
Hirundapus caudacutus	White-throated Needle-tail	Vulnerable	**Moderate** WildNet records indicate species has previously been recorded on the site, however this record was in the year 1990. No recent sightings have been recorded on the site.	**No**

5.1.3 Potential Indirect Impacts

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

The potential indirect impacts that may potentially result from construction activities and/or the operational phase of the Project has been identified below.

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. 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, the project is likely to result in a temporary and minor impact to ecological values due to vehicular movements. Further, ecological field survey confirmed only common 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 the growth and photosynthesis, resulting in reduced habitat quality for fauna. High levels of airborne dust can irritate the respiratory systems of fauna and potentially result in ingestion of dust-coated seeds and other foods. Excessive deposition of dust on open water bodies may also

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- earthworks, including construction of the embankments, and moving, dumping and shaping material; and
- vegetation and soil clearing of the land.

Excessive deposition of dust on leaves of plants can suppress the growth and photosynthesis, resulting in reduced habitat quality for fauna. High levels of airborne dust can irritate the respiratory systems of fauna and potentially result in ingestion of dust-coated seeds and other foods. Excessive deposition of dust on open water bodies may also

degrade water quality and overall habitat quality for fauna. With implementation of standard mitigation measures, the project is likely to result in a temporary and minor impact to ecological values 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 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 ecological values due to the use of light pollution during construction.

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 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 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 the referral area, this is likely to be a temporary and negligible to minor impact.

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.

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 core habitat 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 period.

5.2. Potential Impacts to Matters of National Environmental Significance

5.2.1 EPBC Act Threatened Ecological Communities

The likelihood of occurrence for each TEC within the referral area, as presented in **Table 2**, referred to State Government regional ecosystem mapping within the Locality and known distributions of the TECs, to identifies those TEC's with potential to occur in the Referral area or recorded during field surveys.

The Protected Matters Search Tool (PMST) (refer **Appendix A**) returned the following four threatened ecological communities (TEC), listed under the EPBC Act, as having potential to occur within 5 km of the referral area:

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community
- Lowland Rainforest of Subtropical Australia
- Swamp Tea-tree (*Melaleuca irbyana*) Forest of South-east Queensland
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

The results of the likelihood of occurrence assessment determined that none of the above-mentioned TECs were likely to occur due to the absence of regional ecosystems and species on site typically associated with these TECs. **Field surveys confirmed no TEC's were present within the referral area. Consequently, the Project is not considered likely to impact on any EPBC Act listed TEC's.**

5.2.2 Threatened Flora Species

Database searches returned fifteen (15) flora species, listed as threatened under the EPBC Act and four (4) under the NCA Act as having been previously recorded or predicted to occur within 5 km of the referral area, as presented in **Appendix A.**

Based on the presence of species records within the locality and the habitats within the referral area, a likelihood of occurrence assessment was conducted to determine those threatened flora species with potential to occur within the referral area. The assessment identified that fourteen (14) of the listed threatened flora species had a low risk of impact on site due to being unlikely to occur in the referral area. *Coleus habrophyllus* which is listed as Endangered under the EPBC Act was identified as having moderate risk of occurrence on the site due to previous records of the species proximal to the site.

Detailed field surveys failed to yield evidence of niche habitat features such as rocky outcrops with a south-south-east facing slope. Further, the Mountain Creek and Opossum Creek corridor are heavily weed infested by *Lantana camara*, impacting the viability of *Coleus habrophyllus* to persist in the area. As such, **field surveys confirmed that**

no EPBC listed flora species were present within the referral area. Consequently, the Project is not considered likely to impact upon any EPBC Act or NC Act listed threatened flora species.

5.2.3 Threatened Fauna Species

In reference to **Table 10**, the threatened fauna species with a moderate or higher likelihood of occurring within the referral area, these being the Regent Honeyeater, Swift Parrot, Grey-headed Flying-fox and Koala, and their supported habitats are at risk of potential project related impacts and a significant impact assessment is considered necessary.

5.2.4 Threatened Migratory Species

In reference to **Table 10**, the threatened migratory species with a moderate likelihood of occurring within the referral area and its supported remnant habitats are at no risk of potential project related impacts and significant impact assessment are not considered necessary. Standard spotter-catcher procedures applied during clearing and construction activities should assist in further mitigating any risk of potential, unforeseen impacts.

6. General Mitigation Measures

6.1. Design Considerations

One of the purposes of this report is to identify potential impacts upon ecological values and provide guidance for further design development. Therefore, where practicable, the detailed design stage should consider the extent of the final project footprint in respect to avoiding and minimising impacts to areas of remnant and riparian vegetation, TECs and key habitat values therein.

6.2. Construction Phase

General mitigation measures to be implemented during the construction phase of the Project are outlined below.

6.2.1 Vegetation Clearing and Management Plan

A Vegetation Clearing and Management Plan (VC&MP) should form part of the broader management document submitted as part of the operational works application for the development site. The VC&MP should cover clearing of all vegetation listed in this report and include details on:

- Clearly show trees to be removed
- All civil works likely to impact on existing vegetation
- Temporary and permanent exclusion and protection fencing
- Roles and responsibilities for site contractors, the developer and the consultant group
- Stockpiling and site access locations
- A clearing sequence plan showing the commencement of clearing and direction of removal (this should be in conjunction with the Fauna Management Plan to allow for the appropriate flushing of fauna towards safe havens and/or the application of an appropriate relocation program)
- Links to weed management and revegetation proposals
- The stock piling and reuse of cleared vegetation

6.2.2 Fauna Management Plan

A Fauna Management Plan (FMP) should be prepared for potential impacts of the construction phase covering the loss of vegetated areas, isolated trees and likely barriers and impediments to local dispersal.

The FMP should link closely with the VC&MP and include details on:

- Species surveyed as using the site with a focus on those most likely impacted by development works
- A list of relevant State and Commonwealth legislation constraints and controls for the above listed fauna
- A plan showing existing habitat opportunities and locations

- Details of the threats to existing fauna species
- Clearing sequence plan from the VC&MP
- Management and mitigation measures i.e. temporary use of fauna exclusion fencing
- Fauna spotter role, contacts and certification
- Specific fauna management procedures for potential or known habitat trees

6.2.3 Rehabilitation Management Plan

A Rehabilitation Management Plan (RMP) should form part of the broader management document submitted as part of the operational works drawings for the referral area, and will generally include information on:

- Rehabilitation approaches in accordance with SEQ Ecological Restoration Guidelines (SEQRF)
- Existing and proposed contours
- Locations of services, earthworks
- Existing vegetation to be retained, removed
- Location of waterways and waterbodies
- Major weed infestations and proposed treatments
- Trail and path systems

6.2.4 Fauna Spotter Catcher

A registered and suitability qualified fauna spotter catcher/ecologist will need to be employed for the construction phase of the Project to implement a protocol of best management practises. Significance habitat features, should any be identified on site, will be flagged prior to clearing events and these areas supervised by an appropriately experienced ecologist. Identified within the clearing supervision protocol should be flagging of hollow bearing trees followed by the removal of vegetation surrounding them. After 24 to 72 hours, these trees should then be removed. Trees must be directionally felled into open or already cleared areas.

The objective of this is to enable hollow dependant fauna an opportunity to move on their own accord as many species utilise multiple den/roost sites within a given home range. Certain areas would be identified and flagged as significant such as old-growth trees with hollow resources and on-site identification to construction personnel will help reduce/avoid clearing. Where required, native fauna situated within areas to be cleared will be relocated to a secure area of similar habitat prior to the commencement of vegetation clearance works by a registered fauna spotter/catcher. Should any removal and relocation of nests be required, it is to be undertaken by a suitably qualified and experienced persons and advice sought where necessary.

7. Significance of Impacts

7.1. Significant Impact Assessment Definitions

The Significant Impact Guidelines provides specific definitions for '*important population*' 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.

7.1.1 Population of a species

A 'population of a species' is defined by the Significant Impact Guidelines as:
"An occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

- *A geographically distinct regional population, or collection of local populations*
- *A population, or collection of local populations, that occurs within a particular bioregion.*

7.1.2 Important population

An '*important population*' is defined by the Significant Impact Guidelines as:
"An 'important population' is a population that is necessary for a species' long term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- *Key source populations either for breeding or dispersal*
- *Populations that are necessary for maintaining genetic diversity*
- *Populations that are near the limit of the species range*

7.1.3 Habitat critical to the survival of a species or ecological community

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.*

Such habitat may be, but is not limited to:

- *Habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community*
- *Habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.*

Critical habitat can be further explained as an identified area of viable habitat that contains habitat attributes that are essential for the conservation of a threatened species. These areas are typically under a regime of special protection and management to ensure the critical habitat remains a stronghold for the species to ensure its long-term survival and viability in the wild. Critical habitat may also include an area of land not currently occupied by the species, but can act as a sanctuary by possessing the necessary habitat attributes to facilitate the recovery of a declining population of the species.

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

7.2.1 Conservation Status

The GHFF is listed as Vulnerable under the EPBC Act.

7.2.2 Description

The GHFF is the largest Australian bat with a wingspan of up to one metre. It has dark-grey body fur, a grey head, and a distinctive reddish-brown collar. It is also the only flying-fox with hairy legs right down to its ankles.

7.2.3 Distribution

The GHFF occurs along the south-east coast of Australia, from Rockhampton in central Queensland through New South Wales to western Victoria. During the last few years, the GHFF has also been recorded from Adelaide.

7.2.4 Habitat

The GHFF is heavily dependent on the availability of foraging resources and roost sites. As canopy feeding frugivores and nectavores, GHFFs frequent fruiting and flowering trees in rainforests, open eucalypt forests, woodlands, *Melaleuca sp*. swamps and Banksia woodlands (Duncan *et al*. 1999). The GHFF is also known to forage in fruit crops and introduced tree species within urban environments. Roost sites for the GHFF are commonly within dense vegetation close to water, primarily rainforest patches, stands of *Melaleuca sp.*, mangroves or riparian vegetation.

7.2.5 Recovery Actions

There is no adopted or made Recovery Plan for this species at the federal level. The Queensland Government identifies the following recovery actions:

- Identify and map important foraging and roosting habitats
- Prevent the destruction and degradation of important forested habitat, through: identifying guidelines to protect habitat; appropriate zoning; identifying development alternatives and incentives to retain habitat and educating communities.
- Encourage community partnerships and initiatives that protect important habitats, and where possible re-vegetate with foraging trees for GHFF
- Work with orchardists to improve the image of GHFF, and to identify and implement non-destructive methods to protect fruit crops, such as: appropriate netting (not monofilament netting) that is not hung loose over trees (which can entangle bats and birds)
- Reduce negative public attitudes and conflict with humans

- Develop accurate methods for monitoring population size

7.2.6 Significant Impact Assessment

EPBC Act, Grey-headed Flying-fox populations are listed as Vulnerable. The species is not specifically listed under Queensland's *Nature Conservation Act 1992* (Qld) (NCA), however, retains a Least Concern status for the purposes of the Act. The *Referral guideline for management actions in grey-headed and spectacled flying-fox camps* summarise the decision process in considering the likelihood of a significant impact on the Grey-headed Flying-fox or Spectacled Flying-fox schematically. The Guidelines are specifically for the assessment of impacts on Flying-fox camps. Given no roosting sites are located on-site or in the near vicinity, it is highly unlikely that the action will involve impacts on the Grey-headed Flying-fox according to the Guidelines. However, the Guidelines also state that, '*It does not apply to the following actions... Actions which may impact on the foraging habitat of EPBC Act-listed flying-fox species. Proponents of actions of this kind should refer to the Significant Impact Guidelines 1.1.*'

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 in **Table 11**.

Table 11: Significant Impact Assessment – Vulnerable Grey-headed Flying-fox

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Lead to a long-term decrease in the size of an important population of a species	This species was not observed utilising the site nor observed as a fly over species. Further, no suitable roosting sites occur on or adjacent to the site. SEQ has a permanent and abundant population of GHFF and available habitat is spread throughout the region given the high prevalence of *Eucalypts*. While vegetation on site is considered appropriate foraging habitat for the species, due to the limited habitat quality, proximity to development and absence of evidence of the species utilising the site even as a transient visitor, the site is not considered to support an important population of the species and the proposed action is unlikely to lead to a long term decrease in the size of any local GHFF populations.	No significant impact
2. Reduce the area of occupancy of an important population	This species was not observed utilising the site nor observed as a fly over species. Further, no suitable roosting sites occur on or adjacent to the site. The proposed action will not reduce the area of occupancy of an important population of GHFF as no part of the action will occur within an area known to be occupied by the species.	No significant impact
3. Fragment an existing important population into two or more	The SPRAT species profile outlines that while there are spatially structured colonies of GHFF, there are no separate or distinct populations due to the constant genetic exchange and movement between camps throughout the	No significant impact

	species' geographic range. In addition, given the high mobility of the species, the proposed action is unlikely to fragment a population into two or more populations. Of note, the species was not observed utilising the site nor observed as a fly over species.	
4. Adversely affect habitat critical to the survival of a species	This species was not observed utilising the site nor observed as a fly over species. Despite this, vegetation across the site is considered to be foraging habitat for the species. The proposal will result in the removal of 17.08 ha of GHFF foraging habitat and consequently this project is likely to adversely impact habitat critical to the survival of the species.	**Significant impact likely**
5. Disrupt the breeding cycle of an important population	The site surveys did not identify any evidence of breeding GHFF. 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.	No significant impact
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	While suitable foraging habitat is located across the site, its removal 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.	No significant impact
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed action is unlikely to result in the introduction of invasive species.	No significant impact
8. Introduce disease that may cause the species to decline	The project is unlikely to introduce disease into the area.	No significant impact
9. Interfere substantially with the recovery of the species	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.	No significant impact

7.3. *Lathamus discolor* (Swift Parrot)

7.3.1 Conservation Status

The Swift Parrot is listed as Critically Endangered under the EPBC Act.

7.3.2 Description

The Swift Parrot is mostly 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.

7.3.3 Distribution

The swift parrot breeds in Tasmania during the summer and the entire population migrates north to mainland Australia for the winter. 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.

7.3.4 Habitat

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 in close proximity, 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 macrocarpa, Eucalyptus melliodora, Eucalyptus robusta, Eucalyptus tereticornis* and *Corymbia citriodora*. The species prefers large trees which flower consistently.

7.3.5 Recovery Actions

The Swift Parrot has a National Recovery Plan published in 2011 by Saunders and Tzaros (2011). The overall objective of the National Recovery Plan is to prevent further population decline of the Swift Parrot and to achieve a

demonstratable sustained improvement in the quality and quantity of Swift Parrot habitat to increase carrying capacity. The following actions were designed to achieve the overall objectives of the National Recovery Plan:

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

7.3.6 Significant Impact Assessment

Table 12: Significant Impact Assessment – Critically Endangered Swift Parrot

Significant Impact Criteria	Description	Impact
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 population	The species was not identified on-site during field survey events; however, suitable foraging habitat was noted within the referral area, with species such as *Corymbia citriodora, Eucalyptus robusta* and *Eucalyptus tereticornis* all recorded on-site. It should be noted that detailed habitat quality transects concluded that the vegetation on-site meets the definition of 'remnant', however, due to historical logging activities, large trees were predominantly absent. Analysis of the data indicates that six (6) trees per hectare were equal to or greater than the large tree benchmark (380 mm DBH) for the 'remnant' RE12.9-10.2 vegetation community. The benchmark large trees per hectare the 'remnant' RE12.9-10.2 as per the Queensland Herbarium Benchmark guideline is 38 trees per hectare. As such, the 'remnant' RE12.9-10.2 vegetation community within the referral area meets 7.89 % of the large tree benchmark for the regional ecosystem. This data indicates that although the vegetation community on-site contains potential foraging species for the Swift Parrot, the preferential of the specie to forage in large, mature trees therefore limits the availability of preferred habitat on-site. Further, given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site (Greenbank Military Base located within the Flinders-Karawatha Corridor), the significance of the foraging habitat on-site is considered marginal. This is further supported by the National Recovery Plan for the	No significant impact

	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*". Review of the *Vegetation Management Act 1999* Vegetation Management Report indicates that the referral area does not contain essential habitat for the Swift Parrot, whereas, this is not the case for the Greenbank Military Base.	
2. Reduce the area of occupancy of the species	The species was not identified on-site during field survey events; The species consistently occupies the breeding habitat in Tasmania and utilises habitat in Queensland opportunistically. The impact area associated with the proposed development are relatively small given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site. Therefore, the action will not reduce the area of occupancy of the species.	No significant impact
3. Fragment an existing population into two or more	The species was not identified on-site during field survey events; Given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site the action will not fragment an existing population into two or more.	No significant impact
4. Adversely affect habitat critical to the survival of a species	The species was not identified on-site during field survey events; Given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site the action will not adversely affect habitat critical to the survival of the species.	No significant impact
5. Disrupt the breeding cycle of a population	The Swift Parrot breeds in Tasmania during the austral summer.	No significant impact
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The species was not identified on-site during field survey events; Given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site, the action is not considered to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No significant impact
7. Result in invasive species that are harmful to a critically endangered	The proposed action is unlikely to result in the introduction of invasive species.	No significant impact

species becoming established in the critically endangered species' habitat		
8. Introduce disease that may cause the species to decline	The project is unlikely to introduce disease into the area.	No significant impact
9. Interfere substantially with the recovery of the species	The recovery of the Swift Parrot is focussed on identifying and managing habitat at a landscape scale and monitoring and managing competition and disease, particularly within their breeding habitat in Tasmania. The proposed action is not considered to interfere with the recovery of the species because the habitat on-site is not considered significant, particularly at a landscape scale given it is not recognised within Queensland Government mapping. Further, preferential habitat within close proximity of the site located within a bioregional corridor has been identified. As such, protection of this habitat at a landscape scale is important.	No significant impact

7.4. *Anthochaera phrygia (Regent Honeyeater)*

7.4.1 Conservation Status

The Regent Honeyeater is listed as Critically Endangered under the EPBC Act.

7.4.2 Description

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.

7.4.3 Distribution

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 20 century, but flocks of more than 30 birds are now uncommon.

7.4.4 Habitat

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.

7.4.5 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.

7.4.6 Significant Impact Assessment

Table 13: Significant Impact Assessment – Critically Endangered Regent Honeyeater

Significant Impact Criteria	Description	Impact
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 population	The species was not identified on-site during field survey events; however, suitable foraging habitat was noted within the referral area, with species such as *Corymbia citriodora* and *Eucalyptus robusta* recorded on-site. It should be noted that detailed habitat quality transects concluded that the vegetation on-site meets the definition of 'remnant', however, due to historical logging activities, large trees were predominantly absent. Analysis of the data indicates that six (6) trees per hectare were equal to or greater than the large tree benchmark (380 mm DBH) for the 'remnant' RE12.9-10.2 vegetation community. The benchmark large trees per hectare the 'remnant' RE12.9-10.2 as per the Queensland Herbarium Benchmark guideline is 38 trees per hectare. As such, the 'remnant' RE12.9-10.2 vegetation community within the referral area meets 7.89 % of the large tree benchmark for the regional ecosystem. This data indicates that although the vegetation community on-site contains potential foraging species for the Regent Honeyeater, the preferential of the	No significant impact

	specie to forage in large, mature trees therefore limits the availability of preferred habitat on-site. Further, given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site (Greenbank Military Base located within the Flinders-Karawatha Corridor), the significance of the foraging habitat on-site is considered marginal.	
2. Reduce the area of occupancy of the species	The species was not identified on-site during field survey events; The species has a patchy distribution, particularly in Queensland, where utilisation is considered opportunistic. The impact area associated with the proposed development is relatively small given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site. Therefore, the action will not reduce the area of occupancy of the species.	No significant impact
3. Fragment an existing population into two or more	The species was not identified on-site during field survey events; Given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site the action will not fragment an existing population into two or more.	No significant impact
4. Adversely affect habitat critical to the survival of a species	The species was not identified on-site during field survey events; Given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site the action will not adversely affect habitat critical to the survival of the species.	No significant impact
5. Disrupt the breeding cycle of a population	The Regent Honeyeater typically breeds during spring and summer, from August to February. The Regent Honeyeater was not observed on-site during field surveys. Further, no evidence of breeding was observed.	No significant impact
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The species was not identified on-site during field survey events; Given the superior mobility capacity of the specie and abundance of preferential habitat within close proximity of the site, the action is not considered to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	No significant impact
7. Result in invasive species that are harmful to a critically endangered species becoming established in the	The proposed action is unlikely to result in the introduction of invasive species.	No significant impact

critically endangered species' habitat		
8. Introduce disease that may cause the species to decline	The project is unlikely to introduce disease into the area.	No significant impact
9. Interfere substantially with the recovery of the species	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 and preferential habitat is located within close proximity of the site.	No significant impact

7.5. *Phascolarctos cinereus* (Koala)

7.5.1 Conservation Status

The Koala is listed as Vulnerable under the EPBC Act.

7.5.2 Description

Koalas (*Phascolarctos cinereus*) are native Australian tree-dwelling marsupials with predominantly grey coloured fur.

7.5.3 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 the Koala is influenced by altitude, temperature and leaf moisture. The density of the Koala population in coastal regions is generally greater than inland areas. Koalas are known to naturally inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by *Eucalyptus* sp.

7.5.4 Habitat

Koala habitat can be broadly defined as any forest or woodland containing species that are known Koala food trees, or shrubland and emergent food trees. Preferred food and shelter trees are naturally abundant on fertile clay soils. Along the Great Dividing Range and the coastal belt throughout the species' range, Koalas inhabit moist forests and woodlands mostly dominated by *Eucalyptus* sp.

The Koala species is not territorial and the home ranges of individuals extensively overlap. Home ranges are variable depending on the location, with those in "poorer" habitats being larger than in higher quality habitats. There is little evidence for longer movements in most cases, though dispersing individuals, mostly young males, may occasionally cover distances of several kilometres over land with little vegetation. In SEQ, the average distance between natal and breeding home ranges was similar for males and females, at approximately 3.5 km. Maximum dispersal distances were up to approximately 10 km for males and females. Other studies have reported movement of up to 16 km in rural SEQ.

7.5.5 Threats

Habitat loss and fragmentation, vehicle strike and predation by domestic or feral dogs are the main threats to the Koala. Extreme environmental events, such as drought, can also cause significant mortality.

7.5.6 Significant Impact Assessment

The *EPBC Act referral guidelines for the vulnerable Koala* summarise the significant impact decision for the Koala. The following points help to summarise the guideline:

- Impacts on 'habitat critical to the survival of the species' and impacts that 'substantially interfere with the recovery of the species' are the focus of assessing significance;
- Habitat protection and impact mitigation is focused on areas of habitat that are large and well connected;
- The loss of 20 hectares or more of high-quality habitat critical to the survival (habitat score of 8) is highly likely to have a significant impact for the purposes of the EPBC Act;

- The loss of two hectares or less of marginal quality habitat critical to the survival (habitat score of 5) is highly unlikely to have a significant impact on the koala for the purposes of the EPBC Act;
- The loss of between 2 and 20 ha of habitat critical to the survival may have a significant impact on the koala for the purposes of the EPBC Act. Whether this is more likely or unlikely depends on the characteristics of your action.

To determine whether the proposed action is likely to have a significant impact on the Koala, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided in **Table 14.** An assessment against the *EPBC Act referral guidelines for the vulnerable Koala* is provided in **Section 7.6**.

Table 14: Significant Impact Assessment – Vulnerable Koala

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Lead to a long-term decrease in the size of an important population of a species	Vegetation on-site is considered to be predominantly 'remnant' RE12.9-10.2, with fringing 'remnant' RE12.3.11. While the site does contain habitat assessed as critical for the Koala, field assessments failed to directly locate Koalas on-site despite targeted searches, with only indirect evidence of Low Koala usage recorded in the form of scats. As such, Koalas that potentially utilise the site are considered transient individuals. It is therefore unlikely that an important population is present on-site, and so the action is considered unlikely to decrease the size of an important population.	No significant impact
2. Reduce the area of occupancy of an important population	An important population is not considered present on the referral area for the following reasons: ▪ No Koalas (only evidence of their activity) have been recorded on-site ▪ The site contains low quality critical habitat, and is fragmented from conservation areas ▪ Koala records in the broader Springfield area include specimens carrying disease The proposal is not considered likely to reduce the area of occupancy for an important population as as no evidence of an important population was observed on-site.	No significant impact
3. Fragment an existing important population into two or more	An important population is not considered to utilise the site given lack of koala evidence on-site. Consequently, the project is not considered likely to fragment an existing important population as no evidence of an important population was observed on site.	No significant impact

4. Adversely affect habitat critical to the survival of a species	Critical Koala habitat is located across the site. The proposed action will result in the clearing of 17.08 ha of critical Koala habitat. Consequently, the project is likely to adversely affect habitat critical to the survival of the species.	**Significant impact likely**
5. Disrupt the breeding cycle of an important population	Site surveys did not identify any breeding Koalas. Evidence of Koala activity in the form of scats was recorded on-site, however, no individuals were recorded despite targeted searches. As such, the site is considered to most likely support transient individuals unlikely to constitute a breeding population or an important population.	No significant impact
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	While the vegetation across the site has been assessed as critical Koala habitat, 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.	No significant impact
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Evidence of wild dogs were identified on site in the form of tracks. Domestic dogs have the potential to become feral, are considered a major threat to Koala survival and are present in the surrounding landscape. The proposed action is likely to increase the density of domestic dogs in the area, however, their potential to increase impacts on Koalas will be mitigated by effective governance. Invasive *Lantana camara* is present on-site and is a recognised hindrance to Koala dispersal. It is likely that this invasive plant will be suppressed under the rehabilitation efforts as part of the proposed development. It is unlikely that the proposal will augment invasive species impacts already present in the area.	No significant impact
8. Introduce disease that may cause the species to decline	Most of South East Queensland's Koala populations already have a high prevalence of Chlamydia infection and Koala Retrovirus (KoRV), and sick Koalas have been recorded in the vicinity of the referral area. As such, the project is considered unlikely to cause pressure on the local Koala population to the point where these diseases manifest and the project is extremely unlikely to introduce or spread disease or pathogens into Koala habitat areas.	No significant impact
9. Interfere substantially with the recovery of the species	Analysis suggests the action is unlikely to interfere substantially with the recovery of the Koala, primarily due its fragmentation from surrounding bushland and a lack of records of the Koala utilising the site. Further, the sites location within the Springfield Structure Plan area	No significant impact

	earmarks the site for future development, and as such low value Koala habitat on site will become increasingly isolated from bushland and subject to urban pressures, exacerbating threats to any Koalas that may choose to utilise the site in the future.	

7.6. Assessment against the Koala Referral Guidelines

On 30 April 2012, the Koala populations of Queensland, New South Wales and the Australian Capital Territory were scheduled as Vulnerable under the EPBC Act. This had the effect of making the Koala population in South East Queensland a MNES. As such, an action considered likely to have a significant impact on the Koala or Koala habitat must be referred for controlled action assessment. In December 2014, the '*EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)*' ('Koala Referral Guidelines') were released to guide proponents in determining whether an action will have an impact on the Koala and require referral.

The report considers the environmental impacts against the Significant Impact Guidelines (refer **Section 7.5.6** above) and the Koala Referral Guidelines which support the Commonwealth Government scheduling of the Koala as a Vulnerable species under the provisions of the EPBC Act. The assessment methodology included site surveys (including Koala SAT survey techniques) and consideration of Commonwealth, State and Local Government environmental database searches.

To determine whether the proposed development will have an impact on the Koala, the flow chart **(Figure 5**) in the Koala referral Guidelines has been responded to in the following sections of the report along with an assessment against the Koala Habitat Assessment Tool (refer to **Table 15**).

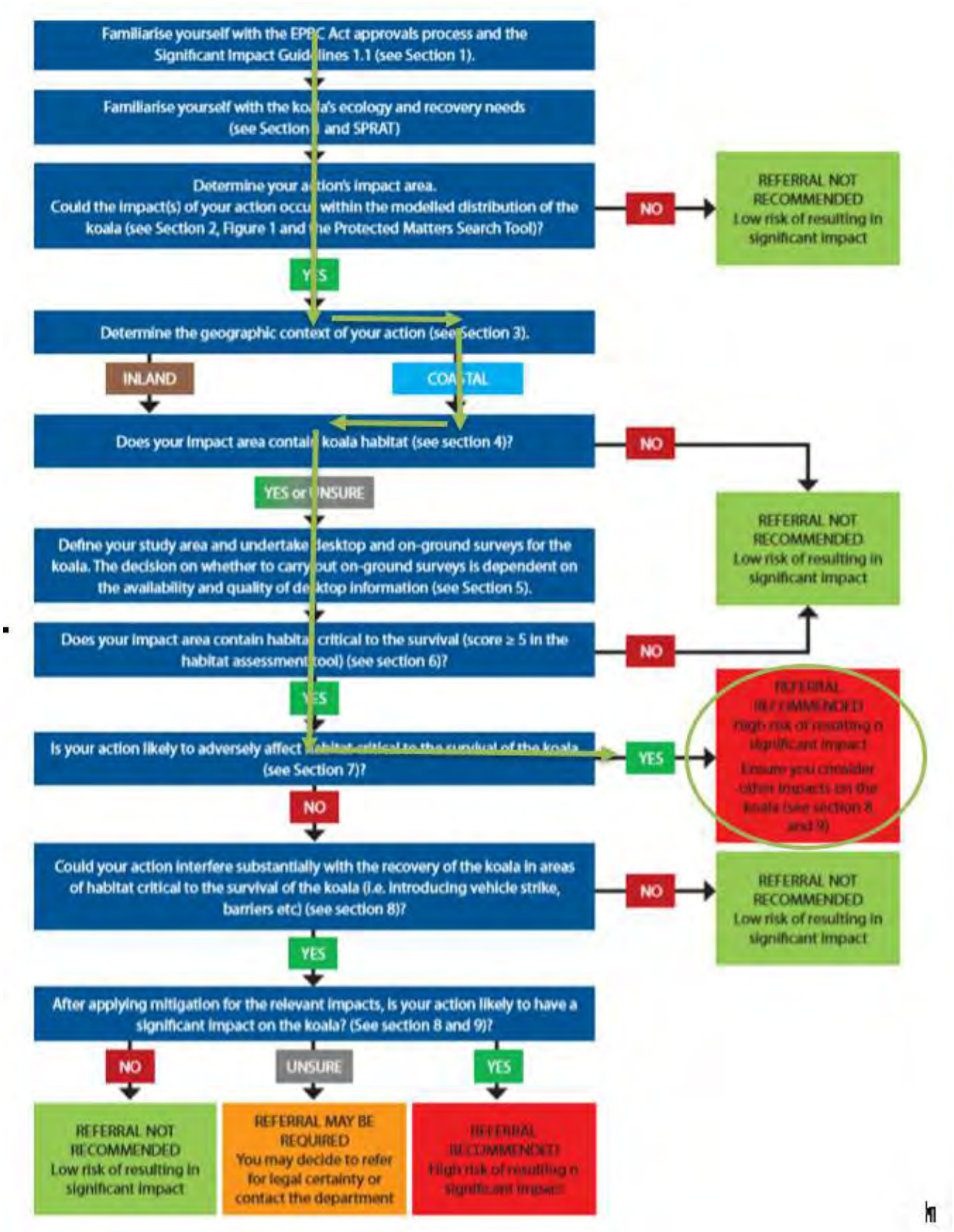


Figure 5: Summary of the EPBC Act referral guidelines for the Koala

Table 15: Koala Habitat Assessment Tool Assessment

Attribute	Score	Comment
Koala occurrence	**+2 (high)**	**Desktop** The PMR using a 5 km radius identified the Koala as having the potential to occur on-site. The Wildlife Online extract identified 207 records of Koala within a 5 km radius of the site. **On-ground** Surveys conducted by SHG (January 2020) resulted in indirect observations of Koalas in the form of scats. The age of these scats is unknown. **There is evidence that one (1) or more Koalas may have utilised the site within the last two (2) years. This attribute has been given a score of 2.**
Vegetation composition	**+2 (high)**	**Desktop** Regional ecosystem mapping published by the Queensland Government identifies the project area as containing predominantly remnant (Category B) vegetation. **On-ground** The site contains a mix of recognised Koala trees in varying densities and maturity. This includes *Corymbia citriodora* (Spotted Gum), *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum). **The site contains a 'woodland' or 'open forest' with two (2) or more known Koala food tree species, the vegetation composition attribute is given a score of 2.**
Habitat connectivity	**+2 (high)**	Connectivity towards the south and west is limited by major arterial roads and large-scale residential development. The development to the west is associated with a current EPBC approval (EPBC2016/7676). The site retains connectivity to the north and east, with the site adjoining existing known koala habitat on the Opossum Creek and Mountain Creek corridors and vacant bushland to the north. Currently, the site is connected to approximately 675 ha. Refer to **Plan 7** for detailed connectivity analysis. **Therefore, this attribute has been given a score of 2.**
Key existing threats	**+1 (medium)**	Two key existing threats pose a risk to survival of local Koala populations; vehicle strike and dog attack. **Vehicle Strike:**

		A review of the Koala Hospital incident data shows that 187 incidences have occurred within a 5 km buffer of the referral area. It should be noted that many live sightings of the Koala in the broader region have been along or proximal to major road networks or highly modified environments. The location of these sightings indicates the risk of motor vehicle strike is considerably high. Additionally, it is noted that anticipated growth and planned residential development surrounding the site will result in increased traffic flows. **<u>Dog Attack:</u>** A recent study completed by Gonzalez-Astudillo *et al.* (2017) analysed the Queensland Koala hospital data from 1997-2013 and found that 1,561 Koalas had injuries associated with trauma from animals, namely dogs. Further, Ipswich City Council's *Koalas in Urban Ipswich* guide suggests dog attacks can account for 40% of total Koala mortalities within an area. The likelihood of a Koala attack is increased when more than one dog is in a backyard, and during the periods of dawn and dusk when Koalas are most active. Further, 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. Refer to **Plan 6** for the hospital incidence within the locality. **As threats from vehicle strikes and dog attacks are present in the area, the key existing threats attribute has been given a score of +1.**
Recovery value	**0 (low)**	The interim recovery objective for coastal areas is based upon protecting and conserving large, connected areas of Koala habitat, particularly where Koalas are genetically diverse or distinct, free of disease or have a low incidence of disease or where there is evidence of breeding and maintain corridors and connective habitat that allows movement of Koalas between large areas of habitat. The site area is situated within the Springfield Structure Plan area, with ongoing residential development and major arterial roads surrounding the site. In its current state, the site retains connectivity to the north and east, with the site adjoining existing known koala habitat on the Opossum Creek and Mountain Creek corridors and vacant bushland to the north. The surrounding locality is earmarked for development to cater for future population growth within SEQ, and hence continued modification and isolation of vegetation is anticipated to occur.

		Although there are patches of vegetation of varying quality proximal to the project, approved development will impact this vegetation either directly or indirectly (e.g., edge effects). This will also result in additional barriers including roads and incompatible urban landscapes. The movement of fauna to and from the site will become dangerous and potentially lead to increased fauna mortality. The referral area has been modified previously due to historical logging and some internal clearing to facilitate the Springfield trunk sewer necessary infrastructure. Vegetation on-site is predominantly of 'remnant', and contains known Koala food trees. However, due to urban development encroaching the boundary of the site and major roads bounding the site, it is not considered that the site will be important in the recovery of the Koala. This is because the site is relatively isolated from surrounding habitat and located within the Springfield Structure Plan area, and hence is not considered viable to support a population of Koala. The local Koala population is not considered genetically distinct from other Koala populations in SEQ. While the health of the local Koalas is unknown, diseases such as Chlamydia and Koala Retrovirus are extremely prevalent amongst SEQ Koalas. Environmental corridors are generally considered to provide the most effective habitat value and connectivity when edge effects are minimised. Strategic planning of the Flinders Karawatha Corridor ensures environmental values and the provision of opportunities for fauna dispersal are maintained across the landscape. As such, within the broader landscape, the referral area is not considered to provide Koala habitat critical to the longevity of the population. Potential dispersal to surrounding bushland habitat is limited. Potential recovery and persistence are highly restricted surrounding intensification of disturbances, extensive urban development and the Springfield Structure Plan area designation. Further, residential development has been approved immediately adjacent to and within the surrounding area and will increase the isolated state of the site from suitable habitat. In summary, the recovery value of the referral area is compromised by its Springfield Structure Plan area designation, the existing and future planned urban development within the local area and existing disturbances from the intensification of planned residential development. **The 'recovery value' attribute has been given a score of 0.**
Total	**7**	**As the habitat score is greater than five (5), the site is considered to provide critical habitat for the Koala.**

4. Critical Koala Habitat Analysis



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 Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless a development approval states otherwise, this is not an approved plan.

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Legend

- Referral Area
- Qld DCDB

Potential Critical Koala Habitat

- Habitat to Remove (17.08ha)

Issue	Date	Description	Drawn	Checked
A	2/03/2020	Preliminary	MP	JG

0 10 20 40 60 80 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:3,000 @ A3

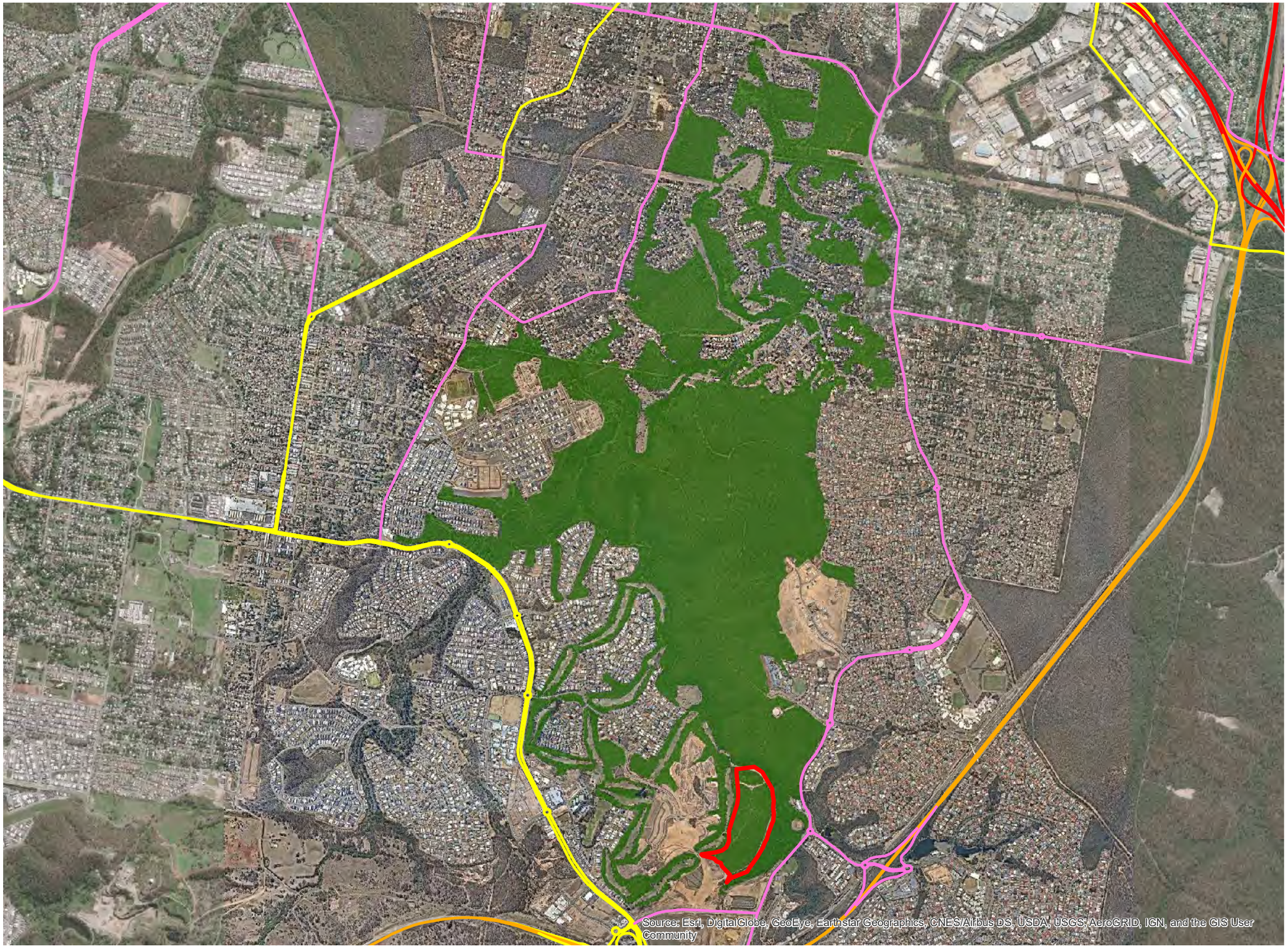
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ADDRESS/RPD: Eden Station Drive, Brookwater *2/03/2020* *7399 E 04 Critical Koala Habitat Analysis A*

5. Contiguous Landscape Analysis



NOTES
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Legend

- Referral Area
- Qld DCDB
- Contiguous Landscape (675ha)

Major Roads

- Road type 1
- Road type 2
- Road type 3
- Road type 4

Issue	Date	Description	Drawn	Checked
A	2/03/2020	Preliminary	MP	JG

0 340 680 1,020 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:27,000 @ A3

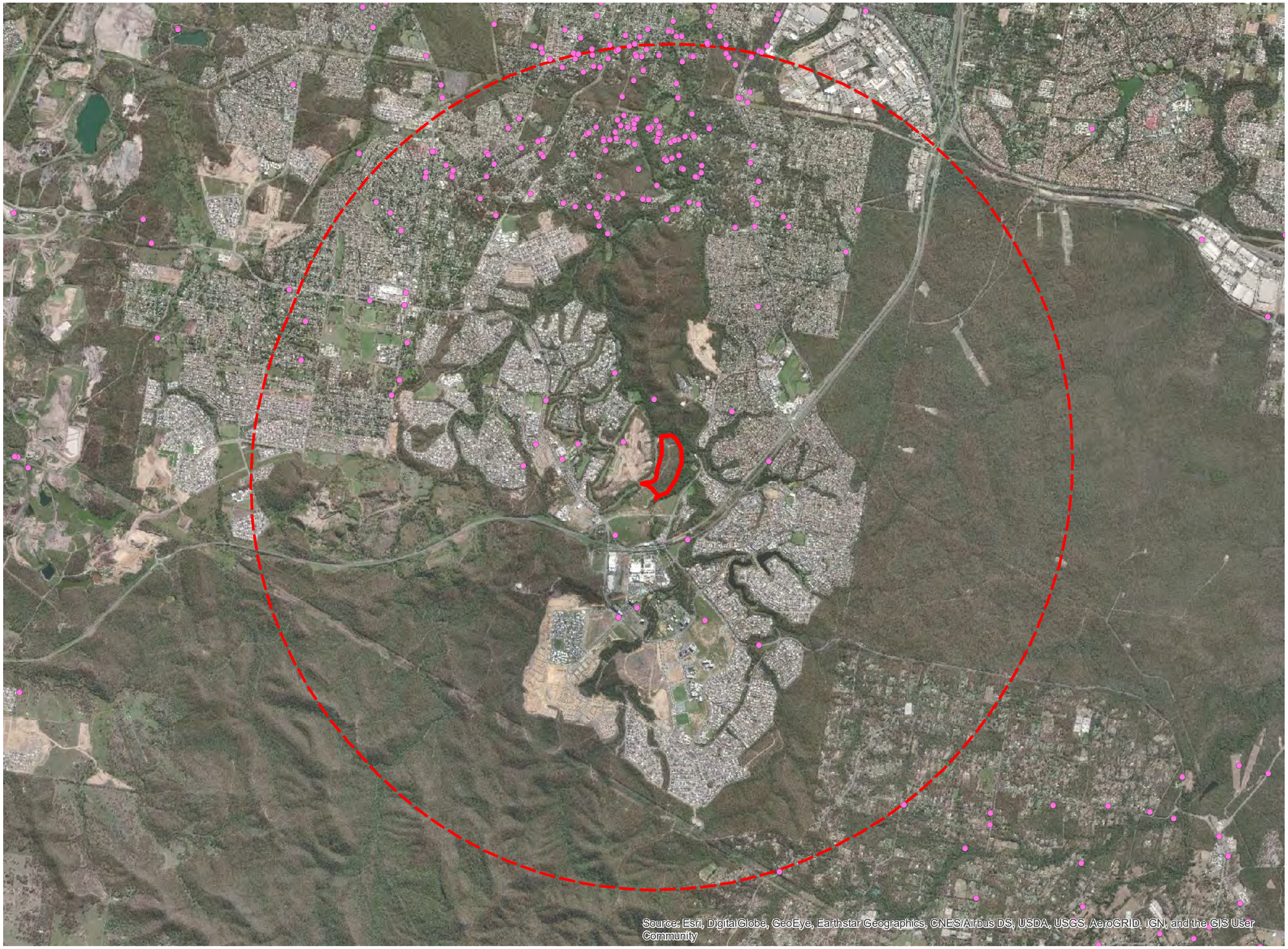
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Peninsula Precinct

ADDRESS/RPD: Eden Station Drive, Brookwater | 2/03/2020 | 7399 E 05 Contiguous Landscape Analysis A

6. Koala Hospital Incident Locations



NOTES
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Legend

- Referral Area
- Referral Area 5km buffer
- Koala hospital incidents (187)

Issue	Date	Description	Drawn	Checked
A	2/03/2020	Preliminary	MP	JG

0 640 1,280 1,920 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:49,000 @ A3

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Peninsula Precinct

ADDRESS/RPD: Eden Station Drive, Brookwater *2/03/2020* *7399 E 06 Koala Hospital Incident Locations A*

8. EPBC Act Significant Residual Impact and Offset Advice

8.1. Significant Residual Impact Summary

Assessing the proposed action against the *EPBC Significant Impact Guidelines 1.1* and against the *EPBC Act referral guidelines for the vulnerable Koala* determined that the action would have a significant impact on 17.08 ha of habitat critical for the survival of Koala and 17.08 ha of foraging habitat for the GHFF. The project is not considered to have a significant impact on foraging habitat for the Swift Parrot and Regent Honeyeater due to the mobility capacity of the species' and abundance of foraging habitat in close proximity of the site.

The Koala Habitat Assessment Tool provided in the *EPBC Act referral guidelines for the vulnerable Koala* scored the habitat on the referral area **7/10.** As the habitat score is greater than five (5), the site is considered to provide critical habitat for the Koala. As such, the clearing of 17.08 ha of critical Koala habitat is considered to be a significant impact.

In the nomination of the proposed development as a 'controlled action' under the EPBC Act referral process, further detailed assessment methodologies as part of the Preliminary Documentation phase are to be species specific to derive the quantum impact score. The methodology to assess the habitat quality for the Koala and Grey-headed Flying-fox are to be the same scoring mechanism at the impact and offset site and relate to habitat requirements for the specific species. Potential assessment methodologies include the Modified Habitat Quality Assessment (Koala) and Grey-headed Flying-fox Foraging Habitat Assessment.

8.2. Offset Advice

The proposed action has been determined to have a significant residual impact on 17.08 ha of critical Koala habitat and 17.08 ha of GHFF foraging habitat. As such, an environmental offset in accordance with the *EPBC Act Environmental Offsets Policy* (2012) is deemed necessary. The environmental offset will need to compensate for 100 % of the impact of the proposed action.

9. Conclusion

This ecological assessment has identified matters of national environmental significance (MNES) recorded or predicted to potentially occur on the referral area. It presents the design and mitigation measures employed to avoid and minimise project related impacts to the matters of conservation significance and quantifies the extent of potential residual impacts.

As the proposed action involves the clearing of 17.08 ha of critical habitat for the Koala at a Koala Habitat Assessment Tool score of 7, SHG recommends that the action be referred for an EPBC Act 'controlled action' assessment. Given the analogous alignment of Koala and GHFF habitat, the proposed action will result in the clearing of 17.08 ha of foraging habitat for the GHFF. Further, as the proposed action is considered to have a significant residual impact on critical habitat for the Koala and GHFF foraging habitat, an environmental offset in accordance with the *EPBC Act Environmental Offsets Policy* (2012) is deemed necessary. The environmental offset will need to compensate for 100 % of the impact of the proposed action.

10. Appendices

Appendix A

EPBC Act Protected Matters Search Tool Results

Appendix B

NCA Wildlife Online Search Results

Appendix C

Likelihood of Occurrence Assessment

Appendix D

SAT survey results

Appendix E

Flora and Fauna Species List

Appendix A

EPBC Act Protected Matters Search Tool Results

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

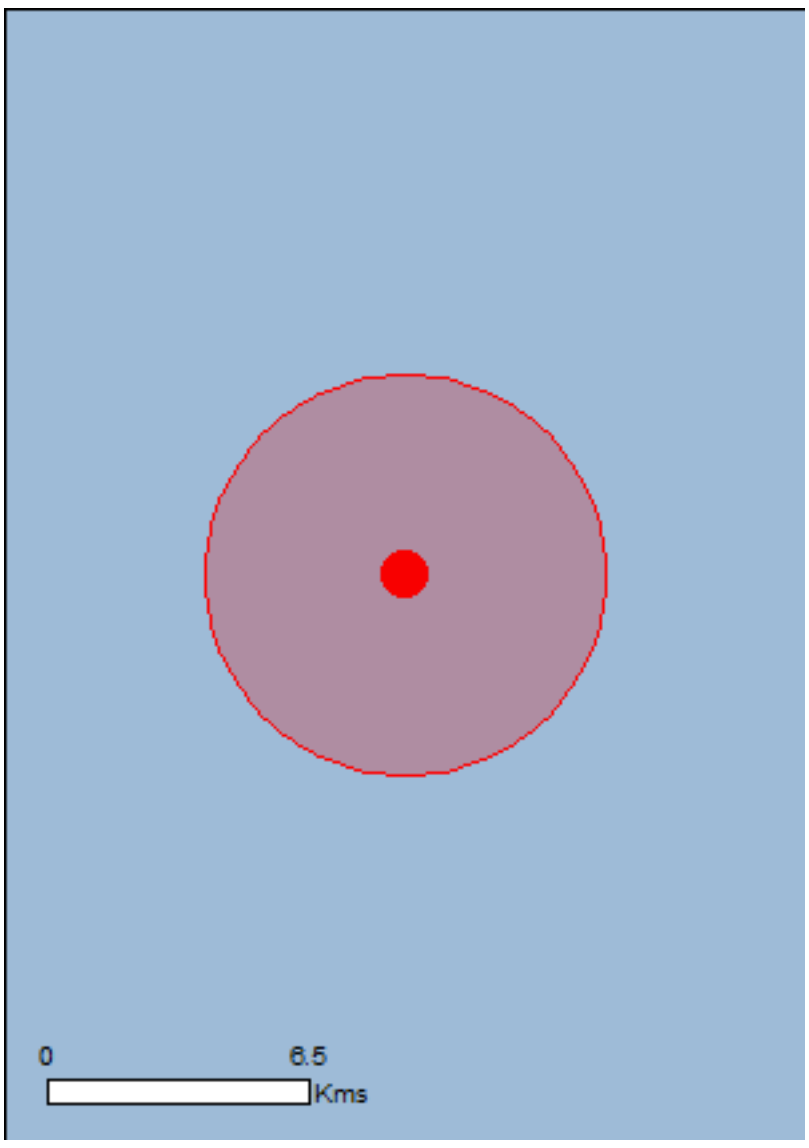
Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

Report created: 21/02/20 08:10:14

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

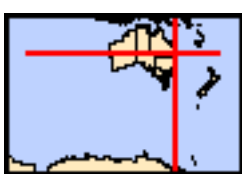
Caveat
Acknowledgements



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates

Buffer: 5.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	41
Listed Migratory Species:	16

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	1
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	34
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Moreton bay	30 - 40km upstream

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat known to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species

Name	Status	Type of Presence
		habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE Mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Corchorus cunninghamii Native Jute [14659]	Endangered	Species or species habitat may occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Cupaniopsis tomentella Boonah Tuckeroo [3322]	Vulnerable	Species or species habitat likely to occur within area
Cycas ophiolitica [55797]	Endangered	Species or species habitat likely to occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Fontainea venosa [24040]	Vulnerable	Species or species habitat may occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat may occur within area
Notelaea ipsviciensis Cooneana Olive [81858]	Critically Endangered	Species or species habitat may occur within area
Notelaea lloydii Lloyd's Olive [15002]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Plectranthus habrophyllus [64589]	Endangered	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat likely to occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Saiphos reticulatus Three-toed Snake-tooth Skink [88328]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		

Name	Threatened	Type of Presence
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Defence - GREENBANK TRAINING AREA

Commonwealth Heritage Places [Resource Information]

Name	State	Status
Natural		
Greenbank Military Training Area (part)	QLD	Listed place

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

State and Territory Reserves [Resource Information]

Name	State
White Rock	QLD

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur

Name	Status	Type of Presence within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Equus caballus Horse [5]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Solanum elaeagnifolium Silver Nightshade, Silver-leaved Nightshade, White Horse Nettle, Silver-leaf Nightshade, Tomato Weed, White Nightshade, Bull-nettle, Prairie-berry, Satansbos, Silver-leaf Bitter-apple, Silverleaf-nettle, Trompillo [12323]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Nationally Important Wetlands [Resource Information]

Name	State
Greenbank Army Training Area C	QLD

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-27.6652 152.9056

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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Appendix B

NCA Wildlife Online Search Results

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: Rare and threatened species
Records: All
Date: Since 1980
Latitude: -27.6652
Longitude: 152.9056
Distance: 5
Email: jamesgautrey@saundershavill.com
Date submitted: Friday 21 Feb 2020 07:13:03
Date extracted: Friday 21 Feb 2020 07:20:02

The number of records retrieved = 13

Disclaimer

As the DSITIA is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Limnodynastidae	*Adelotus brevis*	tusked frog		V		9
animals	birds	Apodidae	*Hirundapus caudacutus*	white-throated needletail		V	V	10
animals	birds	Cacatuidae	*Calyptorhynchus lathami lathami*	glossy black-cockatoo (eastern)		V		3
animals	birds	Psittacidae	*Lathamus discolor*	swift parrot		E	CE	1
animals	birds	Strigidae	*Ninox strenua*	powerful owl		V		8
animals	mammals	Dasyuridae	*Dasyurus maculatus maculatus*	spotted-tailed quoll (southern subspecies)		V	E	2
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		V	V	207
animals	mammals	Pseudocheiridae	*Petauroides volans volans*	southern greater glider		V	V	16
animals	mammals	Vombatidae	*Vombatus ursinus*	common wombat		NT		1
plants	land plants	Apocynaceae	*Marsdenia coronata*	slender milkvine		V		6/6
plants	land plants	Lamiaceae	*Coleus habrophyllus*			E	E	14/14
plants	land plants	Myrtaceae	*Eucalyptus curtisii*	Plunkett mallee		NT		2/2
plants	land plants	Myrtaceae	*Melaleuca irbyana*			E		1/1

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.* The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

Appendix C

Likelihood of Occurrence Assessment

Listed TECs

Name	Status	Type of presence	Description of the community/preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	Coastal Swamp Oak Forest typically occurs on unconsolidated sediments, including alluvium deposits. The canopy layer is dominated by Casuarina glauca (swamp oak, swamp she-oak). This often occurs as a relatively uniform upper layer of swamp oak, with height and density dependent on the local environmental conditions.	Desktop analysis and detailed field surveys confirmed that this TEC does not occur on-site or adjacent to the site.	Low	Low
Lowland rainforest of subtropical Australia	Critically endangered	Community may occur within area	This TEC occurs mainly on basalt and alluvial soils and is characteristic of a low abundance of *Eucalyptus, Melaleuca* and *Casuarina* species. Specimens with buttress roots and a diversity of vines are common throughout this TEC.	Desktop analysis and detailed field surveys confirmed that this TEC does not occur on-site or adjacent to the site.	Low	Low
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area	The Poplar Box Grassy Woodland on Alluvial Plains ecological community is typically a grassy woodland with a canopy dominated by *Eucalyptus populnea* and understorey mostly of grasses and other herbs. The ecological community mostly occurs in gently undulating to flat landscapes and occasionally on gentle slopes on a wide range of soil types of alluvial and depositional origin. This TEC is associated with RE11.3.2, RE11.3.17, RE11.4.7, RE11.4.12, and RE12.3.10.	Desktop analysis and detailed field surveys confirmed that this TEC does not occur on-site or adjacent to the site.	Low	Low
White Box-Yellow Box-Blakely's Red Gum Grassy	Critically endangered	Community may occur within area	Box – Gum Grassy Woodlands and Derived Grasslands are characterised by a species-rich understorey of native tussock grasses, herbs and scattered shrubs, and	Desktop analysis and detailed field surveys confirmed that this TEC does	Low	Low

Woodland and Derived Native Grassland			the dominance, or prior dominance, of White Box, Yellow Box or Blakely's Red Gum trees. In Queensland the ecological community is a primary component of the following Regional Ecosystems: 11.8.2a, 11.8.8, 11.9.9a, 13.3.1, 13.11.8, 13.12.8 and 13.12.9. It can also be a smaller component of the following regional ecosystems: 11.3.23, 12.8.16 (only at the far western edge of the bioregion), 13.3.4, 13.11.3 and 13.11.4. These regional ecosystems range in conservation status from 'not of concern at present' to 'endangered'.	not occur on-site or adjacent to the site.		

Listed threatened species

Scientific name	**Common name**	**Status**		**EPBC code**	**Description of preferred habitat**	**Analysis**	**Desktop Likelihood of occurrence (on-site)**	**Field Survey Confirmed Likelihood of occurrence (on-site)**
		National	**QLD**					
Birds								
Anthochaera phrygia	Regent Honeyeater	CE	E	82338	Regent Honeyeaters mostly occur in dry Box-Ironbark Eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief, wherein they prefer moister, more fertile sites. These areas are generally associated with creek flats and river valleys and foothills. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. They are a generalist forager, which mainly feed	Suitable foraging habitat for the Swift Parrot occurs on and adjacent to the subject site. The referral area is dominated by *Corymbia citriodora* (Spotted Gum), while, the Opossum Creek corridor contains a more prominent abundance of suitable species such as *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus grandis* (Flooded Gum). This species has been sighted recently in the Springfield	High	High

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					on nectar from a wide range of eucalypts and mistletoes.	Lakes area and as a result there is a potential for this species to opportunistically forage on-site.		
Botaurus poiciloptilus	Australasian Bittern	E	-	1001	The Australasian Bittern occurs in terrestrial wetlands and, rarely, estuarine habitats, mainly in the temperate south-east and south-west. It favours wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and / or reeds or cutting grass growing over muddy or peaty substrate. The Australasian Bittern occurs in the far south-east of Queensland; it has been reported North to Baralaba and West to Wyandra, although in most years it is probably confined to a few coastal swamps. It is rarely recorded in Queensland, and possibly survives only in protected areas such as the Cooloola and Fraser regions.	There are no wetlands present on-site.	Low	Low

Scientific name	**Common name**	**Status**		**EPBC code**	**Description of preferred habitat**	**Analysis**	**Desktop Likelihood of occurrence (on-site)**	**Field Survey Confirmed Likelihood of occurrence (on-site)**
		National	**QLD**					
Calidris ferruginea	Curlew Sandpiper	CE	E	856	Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. In Queensland, scattered records occur in the Gulf of Carpentaria, with widespread records along the coast south of Cairns.	No suitable foraging or breeding habitat occurs on-site.	Low	Low
Cyclopsitta diophthalma coxeni	Coxen's Fig Parrot	E	E	59714	The Coxen's Fig Parrot occurs in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, and vine forest. Food is mainly taken from figs however other species fruit have been recorded in their diet including *Elaeocarpus grandis, Syzygium corynanthum, Litsea reticulata* and *Grevillea robusta.*	This site does not contain any rainforest habitat, or species represented in this species diet.	Low	Low

Scientific name	**Common name**	**Status**		**EPBC code**	**Description of preferred habitat**	**Analysis**	**Desktop Likelihood of occurrence (on-site)**	**Field Survey Confirmed Likelihood of occurrence (on-site)**
		National	**QLD**					
Dasyornis brachypterus	Eastern Bristlebird	E	E	533	The Eastern Bristlebird inhabits low dense vegetation in a broad range of habitat types including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest. It occurs near the coast, on tablelands and in ranges. The Eastern Bristlebird is found in habitats with a variety of species compositions, but is defined by a similar structure of low, dense, ground or understorey vegetation.	A variety of species compositions is not present on-site therefore it is unlikely the species would occur here.	Low	Low
Erythrotriorchis radiatus	Red Goshawk	V	V	942	A wide ranging and highly mobile species generally observed over eucalypt habitats. This species prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds) and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins. Habitat has to be open enough for fast attack and manoeuvring in flight, but provide cover for ambushing of prey.	This site does not contain the mosaic of vegetation types that this species favours.	Low	Low

Scientific name	**Common name**	**Status**		**EPBC code**	**Description of preferred habitat**	**Analysis**	**Desktop Likelihood of occurrence (on-site)**	**Field Survey Confirmed Likelihood of occurrence (on-site)**
		National	**QLD**					
Geophaps scripta scripta	Squatter Pigeon (southern)	V	V	64440	This species inhabits open grasslands and woodlands typically with a native understorey although may occur in artificial pasture.	This site does not contain suitable habitat, with a mix of eucalypt woodland with areas that have been highly modified. In addition, the species is very rarely observed in southern Queensland, and thus this species is not expected to occur on-site.	Low	Low
Grantiella picta	Painted Honeyeater	V	V	470	The species inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips.	Preferred habitat is not present on-site.	Low	Low
Hirundapus caudacutus	White-throated Needletail	V	-	682	Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly	WildNet records indicate species has previously been recorded on the site, however this record was in the year 1990. No recent sightings have been recorded on the site.	Moderate	Moderate

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps.			
Lathamus discolor	Swift Parrot	CE	E	744	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.	Suitable foraging habitat for the Swift Parrot occurs on and adjacent to the subject site. The referral area is dominated by *Corymbia citriodora* (Spotted Gum), while, the Opossum Creek corridor contains a more prominent abundance of suitable species such as *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus grandis* (Flooded Gum). This species has been sighted recently in the Springfield Lakes area and as a result there is a potential for this species to opportunistically forage on-site.	High	High
Numenius madagascariensis	Eastern Curlew	CE	E	847	The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries),	No suitable habitat is present on-site.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes use the mangroves. The birds are also found in saltworks and sewage farms.			
Rostratula australis	Australian Painted-snipe	E	V	77037	The Australian Painted Snipe is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled. The species has a scattered distribution throughout many parts of Australia, with a single record from Tasmania.	No suitable wetlands occur on-site.	Low	Low
Turnix melanogaster	Black-breasted Button Quail	V	V	923	Typical habitat occurs in dry rainforest and vegetation immediately adjacent to rainforest. However, the species has also been recorded in a variety of low coastal heathlands around Fraser Island and nearby mainland. Deep leaf litter in which the species can forage appears to be particularly favoured.	The site does not contain dry rainforest or vegetation immediately adjacent to rainforest, and no heathlands are present.	Low	Low
Insects								

Scientific name	**Common name**	**Status**		**EPBC code**	**Description of preferred habitat**	**Analysis**	**Desktop Likelihood of occurrence (on-site)**	**Field Survey Confirmed Likelihood of occurrence (on-site)**
		National	**QLD**					
Argynnis hyperbius inconstans	Australian Fritillary	CE	E	88056	Most specimens have been collected from river estuaries or swampy coastal areas at or near sea level. The Australian fritillary butterfly is restricted to open, swampy, coastal areas where the larval food plant, *Viola betonicifolia*, grows as a small, insignificant ground herb in association with *Lomandra longifolia* (Long Leaved Matrush) and grasses, especially the grass *Imperata cylindrica* (Bladey Grass). This habitat is called *Melaleuca* wetlands, although the larval food plant does not occur in all sub-types of this plant community.	No suitable coastal habitat was observed throughout the assessment area.	Low	Low
Phyllodes imperialis smithersi	Pink Underwing Moth	Endangered			The Pink Underwing Moth is found below the altitude of 600m in undisturbed, subtropical rainforest. It occurs in association with the vine *Carronia multisepalea*.	No suitable habitat was observed throughout the subject site.	Low	Low
Mammals								
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	183	The Large-eared Pied Bat roosts on sandstone cliffs and fertile woodland valley habitat within close proximity of each other. However, in South East Queensland habitat includes rainforest	No suitable high elevation habitat to support this species occurs on-site.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					and moist eucalypt forest habitats at high elevations.			
Dasyurus hallucatus	Northern Quoll	E	-	331	The Northern Quoll occupies a diversity of habitats across its range which includes rocky areas, eucalypt forests and woodlands, rainforests, sandy lowlands and beaches, shrubland, grassland and desert. Northern Quoll habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Eucalypt forest or woodland habitats usually have a high structural diversity containing large diameter trees, termite mounds or hollow logs for denning purposes. Dens are made in rock crevices, tree holes or occasionally termite mounds. Surveys in Queensland suggest that Northern Quolls are more likely to be present in high relief areas that have shallower soils, greater cover of boulders, less fire impact and were closer to permanent water.	No suitable denning habitat to support this species occurs on-site, or in the nearby vicinity.	Low	Low

Scientific name	**Common name**	**Status**		**EPBC code**	**Description of preferred habitat**	**Analysis**	**Desktop Likelihood of occurrence (on-site)**	**Field Survey Confirmed Likelihood of occurrence (on-site)**
		National	**QLD**					
Dasyurus maculatus maculatus	Spot-tailed Quoll	E	V	75184	The Spot-tailed Quoll prefers mature wet forest habitat. Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable. This predominantly nocturnal species rests during the day in dens. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves. Individuals require an abundance of food such as birds and small mammals, and large areas of relatively intact vegetation through which to forage.	The site has been subjecting to high levels of disturbance and does not contain wet forest habitat. It is unlikely this species would occur.	Low	Low
Petauroides volans	Greater Glider	V	V	254	The Greater Glider is an arboreal nocturnal marsupial that 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. Diet consists of eucalypt leaves, and occasionally flowers. Small home ranges and low dispersibility make this species sensitive to clearing and fragmentation, with low persistence in small forest fragments.	A variety of eucalypt species occur over site, however, given the historical logging activities of the site, it is unlikely that the site contains a suitable hollow density to support a greater glider population. It should be noted that WildNet records indicate this species has been sighted previously in the Springfield Lakes area.	Moderate	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
Petrogale penicillata	Brush-tailed Rock Wallaby	V	V	225	This species prefers rocky habitats, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks. It also utilises tree limbs. While it appears that most Brush-tailed Rock-wallaby colonies are on north-facing slopes and cliff lines, colonies have been found on south-facing cliffs in Kangaroo Valley, in the Macleay River Gorge, in the Warrumbungles and at Mt Kaputar, although usually in lower densities.	No suitable habitat was observed throughout the subject site.	Low	Low
Phascolarctos cinereus	Koala	V	V	85104	The Koala is found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland.	Suitable Koala habitat is present on-site and Koalas have been known to occur within close proximity to the site. No direct Koala observations were documented during field surveys, however, indirect observations in the form of scats was identified.	Known	Known
Potorous tridactylus tridactylus	Long-nosed Potoroo	V	V	66645	The Long-nosed Potoroo inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrub of	Suitable habitat is not located on-site.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					tea-trees or melaleucas. A sandy loam soil is also a common feature.			
Pteropus poliocephalus	Grey-headed Flying-fox	V	-	186	Species generally roosts in camps in trees adjacent to larger permanent watercourse. The Grey-headed flying fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feeds on commercial fruit crops. The primary food source is blossom from Eucalyptus and related genera.	While suitable foraging vegetation occurs on-site, the species was not seen utilising this vegetation. In addition, there was no observed roosts on site, with the nearest known roost site located in Pilney Reserve (Barbara Street), 3.6 km north-east.	Moderate	Moderate
Plants								
Bosistoa transversa	Three-leaved Bosistoa	V	-	16091	The Three-leaved Bosistoa is conserved within Mt Warning National Park, Numbinbah Nature Reserve, Limpinwood Nature Reserve and Whian Whian State Forest. While population information is unavailable, it is thought to be common in its range. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 3oo metres in	Rainforest/wet forest and the species that the Three-leaved Bosistoa is commonly associated with were not located on site.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					altitude. It is commonly associated with *Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photinophylla, Acmena ingens, Diploglottis australis and Diospyros mabacea*.			
Bothriochloa bunyensis	Satin-top Grass	V	V	15961	Satin-top Grass is endemic to south-east Queensland where populations occur on Bunya Mountains north of Dalby, near Toowoomba, Crows Nest and the Main Range (Mt Mistake Plateau). Satin-top Grass occurs on relatively fertile krasnozem (dark brown) soils derived from basalt on upper slopes and hill crests at altitudes of 600–1100 m, in grassland or woodland with a grassy understorey.	Site is outside species' known range therefore is unlikely to occur on-site.	Low	Low
Corchorus cunninghamii	Native Jute	E	E	14659	The Native Jute occurs in the ecotone of wet sclerophyll forest and dry to dry-subtropical rainforest (e.g. araucarian microphyll vine forest), and in Hoop Pine (*Araucaria cunninghamii*) plantations. It often occurs on hill crests, exposed slopes, ridges or upper slopes of hilly terrain on south or south-east. It also occurs on sheltered slopes, gullies and on lower	Preferred habitat not present on-site.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					slopes, depending on the topographic position of the sclerophyll-rainforest margin.			
Cupaniopsis shirleyana	Wedge-leaf Tuckeroo	V	V	3205	The Wedge-leaf Tuckeroo occurs in a variety of dry rainforest vegetation types, including vine thicket communities on hillsides, stream beds and along riverbanks at altitudes up to 550 m above sea level. This species is also likely to occur on the margins of native vegetation in scrubby urbanised areas. Predominately found on dark brown sandy loams and sandy clay loams (pH 5-7.5) and rocky scree slopes. Generally, these soils have formed from volcanic parent materials (mainly granites and granodiorites, basalt and andesitic flows, and pyroclastics).	Preferred habitat not present on-site.	Low	Low
Cupaniopsis tomentella	Boonah Tuckeroo	V	V	3322	No description available.	Little is known about species' habitat and distribution. Unlikely to occur on-site in a highly disturbed eucalypt woodland.	Low	Low
Cycas ophiolitica		E	E	55797	*Cycas ophiolitica* grows on hills and slopes in sparse, grassy open forest at altitude ranges from 80–400 m above sea level. Although this species reaches its best development on red clay soils near	Preferred habitat is not present on-site except for areas associated with Land Zone 10. Preferred associated species not present.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					Marlborough, it is more frequently found on shallow, stony, infertile soils, which are developed on sandstone and serpentinite, and is associated with species such as *Corymbia dallachiana, C. erythrophloia, C. xanthope* and *Eucalyptus fibrosa*. *Cycas ophiolitica* has also been found on mudstone in association with *Corymbia dallachiana, C. erythrophloia* and *Eucalyptus crebra*, and on alluvial loams with *Corymbia intermedia*, *Eucalyptus drepanophylla* and *E. tereticornis*.			
Dichanthium setosum	Bluegrass	V	-	14159	In Queensland, bluegrass has been reported from the Leichhardt, Morton, North Kennedy and Port Curtis regions. *Dichanthium setosum* is associated with heavy basaltic black soils and stony red-brown hardsetting loam with clay. It can be found in moderately disturbed areas such as cleared woodland, grassy roadside remnants, grazed land and highly disturbed pasture. The extent to which this species tolerates disturbance is unknown.	There are no local records of this species within the Queensland Wildlife Online sightings data, with the closest sighting in the Toowoomba and surrounds. This species is unlikely to occur on-site due to lack of suitable conditions.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
Fontainea venosa		V	V	24040	Occurs in notophyll vine forest and vine thicket with a mean annual rainfall of 1000-1100 mm on soils derived from and containing abundant andesitic rocks, often on rocky outcrops or along creeks.	Suitable habitat not present on-site.	Low	Low
Macadamia integrifolia	Macadamia Bush	Vulnerable		7326	The Macadamia Nut grows in remnant rainforest. It prefers to grow in mild frost-free areas with reasonably high rainfall. Vegetation communities range from notophyll mixed forest, extremely tall closed forest, simple notophyll mixed very tall closed forest to simple microphyll-notophyll mixed mid-high closed forest with Araucaria and Argyrodendron emergents.	No suitable habitat to support this species occurs on-site.	Low	Low
Macadamia tetraphylla	Rough-shelled Bush Nut	Vulnerable			This species generally occurs in subtropical rainforest and complex notophyll vineforest, at the margins of the forests and mixed sclerophyll forest. It occurs in restricted habitat, growing on moderate to steep hillslopes on alluvial soils at well drained sites.	No suitable habitat to support this species occurs on-site.	Low	Low
Notelaea ipsviciensis	Cooneana Olive	CE	E	81858	The Cooneana Olive survives as an understorey plant in degraded, eucalypt dominated dry sclerophyll vegetation	Site is outside of known species range.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					communities. Soils in the area are of low fertility, depauperate and sandstone-based. This species prefers open woodland communities with open canopies. The known population is adjacent to subdivided, modified and developed land.			
Notelaea lloydii	Lloyd's Olive	V	V	15002	The species occurs on undulating to hilly terrain either in moist gullies or on gentle to steep dry slopes, but is rarely found on rocky outcrops. Soil types are mostly shallow, well drained and stony to very rocky in texture. Found in the ecotone between eucalypt open forests and vine thickets at 80-480 m above sea level (asl).	No suitable habitat to support this species occurs on-site.	Low	Low
Phaius australis	Lesser Swamp-orchid	Endangered		5872	The Lesser Swamp-orchid is commonly associated with coastal wet heath/sedge land wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found. Typically, the Lesser Swamp-orchid is restricted to the swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp Mahogany/Swamp	Suitable habitat to support this species is absent from site.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					Box (*Lophostemon suaveolens*), swampy rainforest (often with sclerophyll emergent), or fringing open forest. It is often associated with rainforest elements such as Bangalow Palm (*Archontophoenix cunninghamiana*) or Cabbage Tree Palm (*Livistona australis*).			
Coleus habrophyllus *(Plectranthus habrophyllus)*	Plectranthus	E	E	64589	Plants have been recorded growing on chert or sandstone outcrops, in open woodlands often in shaded situations near vine forest. Seven populations are known including: Oxley Creek, Greenbank; Opposum Creek, Springfield; Woogaroo Creek, Goodna; three populations within White Rock Conservation Park, incorporating Six Mile Creek Conservation Park near Ormeau (south of Beenleigh).	This species requires niche habitat requirements such a rocky outcrop, limited to no weeds with a relatively undisturbed understorey and shaded location. The population situated on Mountain Creek to the south of the subject site is located on a rocky outcrop facing south-east and contains limited to no weed incursion. These niche species habitat requirements do not occur on-site, however, given that records of the species have been located in close proximity to the site, there may be potential for this species to occur.	Moderate	Low
Samadera bidwillii	Quassia	V	V	29708	Quassia commonly occurs in lowland rainforest or on rainforest margins, but it can also be found in other forest types,	This species favours lowland rainforest or rainforest margins which are absent from the site, and no local records exist.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					such as open forest and woodland. Quassia is commonly found in areas adjacent to both temporary and permanent watercourses in locations up to 510 m altitude. The species occurs on lithosols, skeletal soils, loam soils, sands, silts and sands with clay subsoils.			
Thesium australe	Austral Toadflax	V	V		Austral Toadflax is semi-parasitic on the roots of a range of grass species, notably *Themeda triandra* (Kangaroo Grass). It occurs in shrubland, grassland or woodland, often on damp sites.	No suitable habitat to support this species occurs on-site.	Low	Low
Reptiles								
Delma torquata	Collared Delma	V	V	1656	In general, the species occurs on rocky hillsides on basalt and lateritic soils supporting open eucalypt and Acacia woodland with a sparse understorey of shrubs and tussocks or semi-evergreen vine thicket.	Rocky hillsides present, however, no records exist for this species in the area.	Low	Low
Egernia rugosa	Yakka Skink	V	V	1420	The Yakka Skink is found in open dry sclerophyll forest or woodland. This species will often take refuge among dense ground vegetation, large hollow logs, cavities in soil-bound root systems of	Potential suitable habitat for species to occur, however, no records exist for this species in the area.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
					fallen trees and beneath rocks. They may also excavate burrow systems among low vegetation or below logs			
Furina dunmalli	Dunmall's Snake	V	V	59254	Dunmall's Snake has been found in a broad range of habitats, including forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow other Wattles, native Cypress or Bull-oak, and various Blue Spotted Gum, Ironbark, White Cypress Pine and Bull oak open forest and woodland associations on sandstone derived soils. Dunmall's Snake occurs primarily in the Brigalow Belt region in the south-eastern interior of Queensland. Records indicate sites at elevations between 200–500 m above sea level. The snake is very rare or secretive with limited records existing. It has been recorded at Archokoora, Oakey, Miles, Glenmorgan, Wallaville, Gladstone, Lake Broadwater, Mount Archer, Exhibition Range National Park, roadside reserves between Inglewood and Texas, Rosedale, Yeppoon and Lake Broadwater Conservation Park.	No suitable habitat to support this species occurs on-site.	Low	Low

Scientific name	Common name	Status		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		National	QLD					
Saiphos reticulatus	Three-toed Snake-tooth Skink	V	-	88328	Found mostly in closed forest and possibly open layered Eucalyptus forest. Generally recorded in moist layered forest on loamy basaltic soils, but also found in closed forest overlying silica sand dunes at Cooloola. Within forests, this species is found in well-mulched, loose, friable rainforest soil in leaf litter, often immediately adjacent to fallen tree trunks. Much of the lowland closed forest within its range has been cleared for agriculture and grazing, pasture improvement, crop production, tropical fruit production, and native forest logging. Suitable habitat has generally been reduced to patches, especially in lowland areas.	No suitable habitat to support this species occurs on-site.	Low	Low

Listed migratory species (not listed above)

Scientific name	Common name	EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of Occurrence
Migratory marine birds						

Scientific name	Common name	EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of Occurrence
Apus pacificus	Fork-tailed Swift	678	This species is almost exclusively aerial and mostly occur over inland plains but sometimes above foothills or in coastal areas.	No suitable habitat to support this species occurs on-site.	Low	
Migratory terrestrial species						
Cuculus optatus	Oriental Cuckoo	86651	Non-breeding habitat only: monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia or Eucalyptus woodlands. Frequently at edges or ecotones between habitat types.	No suitable habitat to support this species occurs on-site.	Low	
Monarcha melanopsis	Black-faced Monarch	609	The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine thickets, complex notophyll vine forests, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and occasionally cool temperate rainforest.	No suitable habitat to support this species occurs on-site.	Low	
Monarcha trivirgatus	Spectacled Monarch	610	The Spectacled Monarchs natural habitats are subtropical or tropical moist lowland forests, subtropical or tropical mangrove forests, and subtropical or tropical moist montane forests. Its preference is for thick understorey areas.	No suitable habitat to support this species occurs on-site.	Low	
Motacilla flava	Yellow Wagtail	644	This species occupies a range of damp or wet habitats with low vegetation, from damp meadows, marshes, waterside pastures, sewage farms and bogs to damp steppe and grassy tundra.	No suitable habitat to support this species occurs on-site.	Low	

Scientific name	**Common name**	**EPBC code**	**Description of preferred habitat**	**Analysis**	**Desktop Likelihood of occurrence (on-site)**	**Field Survey Confirmed Likelihood of Occurrence**
Myiagra cyanoleuca	Satin Flycatcher	612	Satin Flycatchers inhabit heavily vegetated gullies in eucalypt dominated forests and taller woodlands, and on migration occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	No suitable habitat to support this species occurs on-site.	Low	
Rhipidura rufifrons	Rufous Fantail	592	The Rufous fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by Eucalypts such as *Eucalyptus microcorys*, *Eucalyptus pilularis*, *Eucalyptus resiniferia* and a number of other Eucalyptus species.	WildNet records indicate species has been previously observed in Springfield Lakes area.	Moderate	
Migratory wetland species						
Actitis hypoleucos	Common Sandpiper	59309	The Common Sandpiper utilises a wide range of coastal wetlands and some inland wetlands, including estuaries and deltas of streams, banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and clay pans, and occasionally piers and jetties. They are mostly found in shallow water, around muddy margins or rocky shores and sometimes in muddy areas littered with rocks or snags. The species commonly utilises mangroves for foraging and roosting but is rarely seen on mudflats.	No suitable foraging or breeding habitat occurs on-site.	Low	
Calidris acuminata	Sharp-tailed Sandpiper	874	In Australia, the Sharp-tailed Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh, and beach cast algae / seaweed or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore	No suitable foraging or breeding habitat occurs on-site.	Low	

Scientific name	Common name	EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of Occurrence
			swamps, saltpans and hypersaline salt lakes inland. They also occur in salt works and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves.			
Calidris melanotos	Pectoral Sandpiper	858	The Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. Occasionally found further inland.	No suitable foraging or breeding habitat occurs on-site.	Low	
Gallinago hardwickii	Latham's Snipe	863	Latham's Snipe occurs in permanent and ephemeral wetlands. They usually inhabit open, freshwater wetlands with low, dense vegetation.	No suitable foraging or breeding habitat occurs on-site.	Low	
Pandion haliaetus	Osprey	952	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers.	No suitable foraging or breeding habitat occurs on-site.	Low	
Tringa nebularia	Common Greenshank	832	The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. The species is known to forage at the edges of wetlands in soft mud or mudflats.	No suitable foraging or breeding habitat occurs on-site.	Low	

Appendix D

SAT survey results

SAT Survey ID				
Tree Number	**Scientific Name**	**Common Name**	**DBH**	**Scat (Y/N)**
1	*Corymbia citriodora*	Spotted Gum	120	N
2	*Corymbia citriodora*	Spotted Gum	160	N
3	*Corymbia citriodora*	Spotted Gum	180	N
4	*Corymbia citriodora*	Spotted Gum	160	N
5	*Corymbia citriodora*	Spotted Gum	120	N
6	*Eucalyptus moluccana*	Gum-topped Box	100	N
7	*Corymbia citriodora*	Spotted Gum	100	N
8	*Corymbia citriodora*	Spotted Gum	160	N
9	*Eucalyptus moluccana*	Gum-topped Box	250	N
10	*Eucalyptus moluccana*	Gum-topped Box	100	N
11	*Corymbia citriodora*	Spotted Gum	160	N
12	*Corymbia citriodora*	Spotted Gum	180	N
13	*Corymbia citriodora*	Spotted Gum	200	N
14	*Eucalyptus moluccana*	Gum-topped Box	120	N
15	*Eucalyptus moluccana*	Gum-topped Box	120	N
16	*Corymbia citriodora*	Spotted Gum	120	N
17	*Corymbia citriodora*	Spotted Gum	100	N
18	*Corymbia citriodora*	Spotted Gum	190	N
19	*Corymbia citriodora*	Spotted Gum	210	N
20	*Corymbia citriodora*	Spotted Gum	150	N
21	*Corymbia citriodora*	Spotted Gum	130	N
22	*Corymbia citriodora*	Spotted Gum	210	N
23	*Corymbia citriodora*	Spotted Gum	140	N
24	*Corymbia citriodora*	Spotted Gum	140	N
25	*Eucalyptus moluccana*	Gum-topped Box	250	N
26	*Corymbia citriodora*	Spotted Gum	160	N

27	*Corymbia citriodora*	Spotted Gum	140	N
28	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	130	N
29	*Eucalyptus moluccana*	Gum-topped Box	370	N
30	*Eucalyptus moluccana*	Gum-topped Box	300	N
Total				0

SAT Survey ID				
Tree Number	**Scientific Name**	**Common Name**	**DBH**	**Scat (Y/N)**
1	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	150	N
2	*Eucalytpus tereticornis*	Forest Red Gum	130	N
3	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	140	N
4	*Corymbia citriodora*	Spotted Gum	150	N
5	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	140	N
6	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	380	N
7	*Eucalytpus tereticornis*	Forest Red Gum	200	N
8	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	140	N
9	*Eucalytpus tereticornis*	Forest Red Gum	200	N
10	*Corymbia citriodora*	Spotted Gum	190	N
11	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	190	N
12	*Corymbia citriodora*	Spotted Gum	400	N
13	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	210	N
14	*Corymbia citriodora*	Spotted Gum	220	N
15	*Corymbia citriodora*	Spotted Gum	200	N
16	*Corymbia citriodora*	Spotted Gum	130	N
17	*Eucalytpus tereticornis*	Forest Red Gum	130	N
18	*Corymbia citriodora*	Spotted Gum	180	N
19	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	180	Y
20	*Corymbia citriodora*	Spotted Gum	120	Y
21	*Corymbia citriodora*	Spotted Gum	150	N
22	*Corymbia citriodora*	Spotted Gum	190	N
23	*Eucalytpus tereticornis*	Forest Red Gum	140	N
24	*Corymbia citriodora*	Spotted Gum	150	N
25	*Angophora leiocarpa*	Smooth-barked Apple	100	N
26	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	240	N
27	*Corymbia citriodora*	Spotted Gum	130	N
28	*Acacia disparrima*	Hickory Wattle	100	N
29	*Corymbia citriodora*	Spotted Gum	100	N
30	*Eucalytpus tereticornis*	Forest Red Gum	210	N

Total				2

SAT Survey ID				
Tree Number	**Scientific Name**	**Common Name**	**DBH**	**Scat (Y/N)**
1	*Corymbia intermedia*	Pink Bloodwood	210	N
2	*Corymbia citriodora*	Spotted Gum	180	N
3	*Eucalyptus terteticornis*	Forest Red Gum	140	N
4	*Corymbia intermedia*	Pink Bloodwood	200	N
5	*Acacia disparrima*	Hickory Wattle	100	N
6	*Corymbia citriodora*	Spotted Gum	120	N
7	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	400	N
8	*Eucalyptus moluccana*	Gum-topped Box	150	N
9	*Corymbia intermedia*	Pink Bloodwood	200	N
10	*Corymbia citriodora*	Spotted Gum	160	N
11	*Corymbia intermedia*	Pink Bloodwood	220	N
12	*Eucalyptus terteticornis*	Forest Red Gum	210	N
13	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	400	N
14	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	280	N
15	*Eucalyptus moluccana*	Gum-topped Box	210	N
16	*Eucalyptus moluccana*	Gum-topped Box	400	N
17	*Eucalyptus terteticornis*	Forest Red Gum	130	N
18	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	220	N
19	*Corymbia intermedia*	Pink Bloodwood	150	N
20	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	280	N
21	*Corymbia citriodora*	Spotted Gum	250	N
22	*Corymbia citriodora*	Spotted Gum	340	N
23	*Corymbia citriodora*	Spotted Gum	160	N
24	*Corymbia intermedia*	Pink Bloodwood	200	N
25	*Eucalyptus terteticornis*	Forest Red Gum	220	N
26	*Eucalyptus terteticornis*	Forest Red Gum	130	N
27	*Eucalyptus terteticornis*	Forest Red Gum	230	N
28	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	260	N
29	*Eucalyptus terteticornis*	Forest Red Gum	140	N
30	*Eucalyptus terteticornis*	Forest Red Gum	150	N
Total				0

SAT Survey ID				
Tree Number	**Scientific Name**	**Common Name**	**DBH**	**Scat (Y/N)**
1	*Eucalyptus grandis*	Flooded Gum	600	N
2	*Celtis sinensis*	Chinese Elm	140	N
3	*Celtis sinensis*	Chinese Elm	180	N
4	*Pinus elliotti*	Slash Pine	120	N
5	*Pinus elliotti*	Slash Pine	300	N
6	*Pinus elliotti*	Slash Pine	220	N

7	*Pinus elliotti*	Slash Pine	200	N
8	*Pinus elliotti*	Slash Pine	170	N
9	*Pinus elliotti*	Slash Pine	160	N
10	*Pinus elliotti*	Slash Pine	210	N
11	*Pinus elliotti*	Slash Pine	240	N
12	*Pinus elliotti*	Slash Pine	220	N
13	*Pinus elliotti*	Slash Pine	230	N
14	*Pinus elliotti*	Slash Pine	220	N
15	*Pinus elliotti*	Slash Pine	320	N
16	*Pinus elliotti*	Slash Pine	160	N
17	*Pinus elliotti*	Slash Pine	160	N
18	*Celtis sinensis*	Chinese Elm	110	N
19	*Pinus elliotti*	Slash Pine	150	N
20	*Pinus elliotti*	Slash Pine	100	N
21	*Pinus elliotti*	Slash Pine	140	N
22	*Pinus elliotti*	Slash Pine	180	N
23	*Pinus elliotti*	Slash Pine	220	N
24	*Pinus elliotti*	Slash Pine	230	N
25	*Pinus elliotti*	Slash Pine	270	N
26	*Pinus elliotti*	Slash Pine	260	N
27	*Pinus elliotti*	Slash Pine	130	N
28	*Pinus elliotti*	Slash Pine	180	N
29	*Pinus elliotti*	Slash Pine	120	N
30	*Pinus elliotti*	Slash Pine	220	N
Total				0

SAT Survey ID				
Tree Number	**Scientific Name**	**Common Name**	**DBH**	**Scat (Y/N)**
1	*Acacia melanoxylon*	Australian Blackwood	240	N
2	*Eucalyptus grandis*	Flooded Gum	580	N
3	*Eucalyptus grandis*	Flooded Gum	570	N
4	*Eucalyptus grandis*	Flooded Gum	410	N
5	*Eucalyptus grandis*	Flooded Gum	880	N
6	*Eucalyptus grandis*	Flooded Gum	510	N
7	*Eucalyptus grandis*	Flooded Gum	560	N
8	*Acacia melanoxylon*	Australian Blackwood	190	N
9	*Acacia melanoxylon*	Australian Blackwood	210	N
10	*Eucalyptus grandis*	Flooded Gum	490	N
11	*Eucalyptus grandis*	Flooded Gum	680	N
12	*Eucalyptus grandis*	Flooded Gum	500	N
13	*Acacia melanoxylon*	Australian Blackwood	240	N
14	*Acacia melanoxylon*	Australian Blackwood	130	N
15	*Lophostemon sauveolans*	Swamp Box	300	N
16	*Acacia melanoxylon*	Australian Blackwood	220	N
17	*Eucalyptus grandis*	Flooded Gum	520	N
18	*Acacia melanoxylon*	Australian Blackwood	180	N
19	*Eucalyptus grandis*	Flooded Gum	610	N
20	*Eucalyptus grandis*	Flooded Gum	430	N

21	*Eucalyptus grandis*	Flooded Gum	490	N
22	*Eucalyptus grandis*	Flooded Gum	430	N
23	*Eucalyptus grandis*	Flooded Gum	480	N
24	*Cinnamomum camphora*	Camphor Laurel	230	N
25	*Eucalyptus grandis*	Flooded Gum	580	N
26	*Ulmus parvifolia*	Chinese Elm	120	N
27	*Eucalyptus grandis*	Flooded Gum	580	N
28	*Alphitonia excelsa*	Soap Tree	160	N
29	*Ulmus parvifolia*	Chinese Elm	130	N
30	*Eucalyptus grandis*	Flooded Gum	980	N
Total				0

Appendix E

Flora and Fauna Species List

FLORA SPECIES LIST

Species	**Common Name**	**Native/Introduced**
Acacia concurrens	Black wattle	Native
Acacia disparrima	Hickory Wattle	Native
Acacia fimbriata	Brisbane Wattle	Native
Acacia salicina	Sally Wattle	Native
Adaintum atroviride	Maidenhair Fern	Native
Allocasuarina littoralis	Black She Oak	Native
Alphitonia excelsa	Soap Tree	Native
Angophora leiocarpa	Smooth Bark Apple	Native
Breynia oblongifolia	Coffee Bush	Native
Cassinia laevis	Cough Bush	Native
Cassytha pubescens	Dodder Laurel	Native
Cheilanthes distans	Bristle Cloak Fern	Native
Corymbia citriodora	Spotted Gum	Native
Corymbia intermedia	Pink Bloodwood	Native
Corymbia tessellaris	Morteon Bay Ash	Native
Dianella caerulea	Blueberry Lilly	Native
Dianella nervosa	Blue Lilly	Native
Dockrillia linguiformis	Tongue Orchid	Native
Dodonaea viscosa	Hop Bush	Native
Eremophia debilis	Winter Apple	Native
Eucalyptus crebra	Narrow Leaf Ironbark	Native
Eucalyptus fibrosa	Broad-leaved Ironbark	Native
Eucalyptus major	Grey Gum	Native
Eucalyptus microcorys	Tallowwood	Native
Eucalyptus moluccana	Gum-topped Box	Native
Eucalyptus resinifera	Red Stringybark	Native
Eucalyptus grandis	Flooded Gum	Native
Eucalyptus seeana	Narrow Leaf Red Gum	Native
Eucalyptus tereticornis	Forest Red Gum	Native
Eustrephus latifolius	Wombat Berry	Native
Gahnia aspera	Saw Sedge	Native
Geitonoplesium cymosum	Scrambling Lilly	Native
Glochidion ferdinandi	Cheese Tree	Native
Goodenia rotundifolia	Goodenia	Native
Grevillea robusta	Silky Oak	Native
Hardenbergia violacea	Native Sarsaparila	Native
Hybanthus stellarioides	Spade Flower	Native
Imperata cylindrica	Blady Grass	Native
Jagera pseudorhus	Foambark	Native
Juncus sp.	Rushes	Native
Lobelia purpurascens	White Root	Native

Lomandra longifolia	Mat Rush	Native
Lomandra multiflora	Many-flowered Mat Rush	Native
Lophostemon confertus	Brush Box	Native
Lophostemon suaveolens	Swamp Box	Native
Melia azedarach	White Cedar	Native
Nephrolepis cordifolia	Fishbone Fern	Native
Parsonsia straminea	Monkey Rope Vine	Native
Petalostigma pubescens	Quinine Bush	Native
Platycerium bifurcatum	Elkhorn	Native
Poa labillardieri	Tussock Grass	Native
Pteridium esculentum	Bracken Fern	Native
Pyrrosia confluens	Robber Fern	Native
Schefflera actinophylla	Umbrella Tree	Native
Smilax australis	Barbed-wire Vine	Native
Themeda triandra	Kangaroo Grass	Native
Trema tomentosa	Poison Peach	Native
Wahlenbergia gracilis	Small-Flowered Bluebell	Native
Ageratina adenophora	Crofton Weed	Introduced
Ageratina riparia	Mistflower	Introduced
Ageratum houstonianum	Blue Billygoat Weed	Introduced
Ambrosia artemisiifolia	Annual Ragweed	Introduced
Asparagus africanus	Climbing Asparagus Fern	Introduced
Baccharis halimifolia	Groundsel	Introduced
Bidens pilosa	Cobblers Pegs	Introduced
Celtis sinensis	Chinese Elm	Introduced
Chloris gayana	Rhodes Grass	Introduced
Chloris virgata	Feathertop Rhodes Grass	Introduced
Cinnamomum camphora	Camphor Laurel	Introduced
Cirsium vulgare	Spear Thistle	Introduced
Commelina diffusa	Wandering Jew	Introduced
Conyza bonariensis	Flaxleaf Fleabane	Introduced
Crassocephalum crepidioides	Thickhead	Introduced
Desmodium uncinatum	Silver-leaved Desmodium	Introduced
Gomphocarpus physocarpus	Balloon Cotton Bush	Introduced
Hypochaeris radicata	Flatweed	Introduced
Ipomoea cairica	Mile-a-minute	Introduced
Lantan a camara	Lantana	Introduced
Lantana montevidensis	Creeping Lantana	Introduced
Leucaena leucocephala	Leucaena	Introduced
Megathyrsus maximus	Guinea Grass	Introduced
Melinis repens	Red Natal Grass	Introduced
Ochna serrulata	Ochna	Introduced
Opuntia stricta	Prickly Pear	Introduced
Paspalum dilatatum	Paspalum Grass	Introduced

Passiflora subpeltata	White Passionfruit	Introduced
Passiflora suberosa	Corky Passionfruit	Introduced
Pinus elliotii	Slash Pine	Introduced
Psidium guajava	Guava	Introduced
Schinus terebinthifolius	Broad-leaf Pepper Tree	Introduced
Senecio madagascariensis	Fireweed	Introduced
Senna pendula	Easter Cassia	Introduced
Seteria sphacelata	Setaria	Introduced
Sida cordifolia	Flannel Weed	Introduced
Solanum mauritianum	Wild Tobacco Tree	Introduced
Solanum seaforthianum	Brazialian Nightshade	Introduced
Solanum torvum	Devils Fig	Introduced
Sporobolus pyramidalis	Rat's Tail Grass	Introduced
Syagrus romanzoffianum	Cocus Palm	Introduced
Tagetes minuta	Stinking Roger	Introduced
Tecoma stans	Yellow Bells	Introduced
Themeda quadrivalvis	Grader Grass	Introduced
Tradescantia fluminensis	Wandering Jew	Introduced

FAUNA SPECIES LIST

Scientific Name	**Common Name**
Coracina novaehollandiae	Black-faced Cuckoo-shrike
Corvus orru	Torresian Crow
Coturnix ypsilophora	Brown Quail
Cracticus torquatus	Grey Butcherbird
Dacelo novaeguineae	Laughing Kookaburra
Dendrelaphis punctulata	Common Tree Snake
Eopsaltria australis	Eastern Yellow Robin
Gymnorhina tibicen	Australian Magpie
Lepus europaeus	Hare
Macropus agilis	Agile Wallaby
Macropus giganteus	Eastern Grey Kangaroo
Malurus cyaneus	Superb Fairy-wren
Malurus melanocephalus	Red-backed Fairy Wren
Manorina melanocephala	Noisy Minor
Merops ornatus	Rainbow Bee-eater
Milvus migrans	Black Kite
Myzomela sanguinolenta	Scarlet Honeyeater
Philemon corniculatus	Noisy Friarbird
Rhipidura fuliginosa	Grey Fantail
Rhipidura leucophrys	Willie Wagtail
Smicrornis brevirostris	Weebill

Taeniopygia bichenovii	Double-barred Finch
Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet
Trichoglossus haematodus	Rainbow Lorikeet

Attachment A4

Koala Connectivity and Sustainability Analysis, BAAM Pty Ltd 2026

Technical Memorandum

Component:	Koala Connectivity and Sustainability Analysis
Project Title:	Scenic and Peninsula Precinct Developments, Springfield
File Number:	0633-003
Client:	Saunders Havill Group
Project Author/s:	Adrian Caneris, Dr Elizabeth Williams, Dr Victoria Thomson
Date:	September 21, 2026

Background and Purpose

Biodiversity Assessment and Management Pty Ltd (BAAM) have been engaged to undertake an independent technical analysis and complete an assessment of the ability of the size and function of the retained habitat areas to support the local population for two referral areas: Scenic Precinct (EPBC 2020/8651) and Peninsula Precinct (EPBC 2020/8629).

BAAM are familiar with the developments in the project area, including both Scenic and Peninsula Precincts, having completed surveys in this general area in the past and for this review we have:

1. Defined and reviewed the landscape context of the impact area and surrounding habitat;
2. Reviewed species records (historical and contemporary) on-site and within the local proximity to the project area;
3. Included and discussed the results of a thermal drone audit of the land and adjacent areas, to gather an understanding of Koala presence and abundance at the site;
4. Review other available data sources from the site and area, including surveys completed by technical ecologists from surrounding projects.
5. Review relevant extracts from Ipswich City Council's Koala Conservation and Habitat Management Plan, including the results of Koala detection dog surveys completed in the local area by OWAD Environment.
6. Considered the project impacts in conjunction with other known project EPBC referrals adjoining or within context of the project site, including the Springfield Residential Development (EPBC 2019/8575); and
7. Reviewed the broader connectivity of the landscape, available habitat, existing and, based on planning documents, potential future barriers to Koala movement.

To undertake this analysis, we have identified the study area being based on the impact site and the species typical home range in south-east Queensland (as per Dique et al., 2003). Consideration was also given for the species wider dispersal/landscape undertaken in relation to functional connectivity based on longer term dispersal from the impact site, and linear connections located proximal to the Scenic and Peninsula Precinct warranting a detailed review of this area.

As no long-term monitoring data is available for the Koala population within the study area, this analysis is based on records, habitat mapping and relatively recently completed detailed technical studies on or near the referral sites.

We defined the home range study area (4,141.7 ha) based on a 3 km buffer from both precincts' referral area boundaries (**Figure 1**). This distance is based on dispersal estimates for habitat assessments (Youngentob et al., 2021). The boundary to the study area was considered to be a conservative distance (i.e., greater) than the typical home range of urban and peri-urban Koalas in the greater Brisbane region (e.g., Dique et al., 2003; de Oliveira et al., 2014; Tacla et al., 2025), which was used to define the area that would support the local population. Koalas may disperse outside this area for breeding and/or when permanently migrating to new areas (e.g., immature, and particularly male, Koalas after leaving their mother; Dique et al., 2003).

Our review of the proposed impacts from EPBC projects within the home range study area identified the extent of habitats retained and removed as provided in **Table 1**. The requested analysis is discussed below with explanatory figures.

Table 1: BAAM home range area EPBC project impact review:

Area	Total Area	Retention Area		Koala Habitat Removed	Koala Habitat Temporarily Impacted
		Non-habitat	Koala Habitat		
Koala food/shelter habitat in home range area	**1,353.2 ha**				
Scenic Precinct (EPBC 2020/8651)	**24.2 ha**	0 ha	0 ha	24.2 ha	
Peninsula Precinct (EPBC 2020/8629)	**18.9 ha**	0 ha	0 ha	18.9 ha	
Springfield Residential Development (2019/8575)	**161.4 ha**	1.9 ha	25.6 ha	131.3 ha*	2.6 ha

*Includes 7.45 ha approved impact under approval EPBC 2014/7306.

Koala Records

Examination of the Atlas of Living Australia (ALA) database indicates there are two records of Koala within or immediately (<100 m) adjacent to the referral sites, both in the northern part of the Scenic Precinct or its buffer area (**Figure 1**).

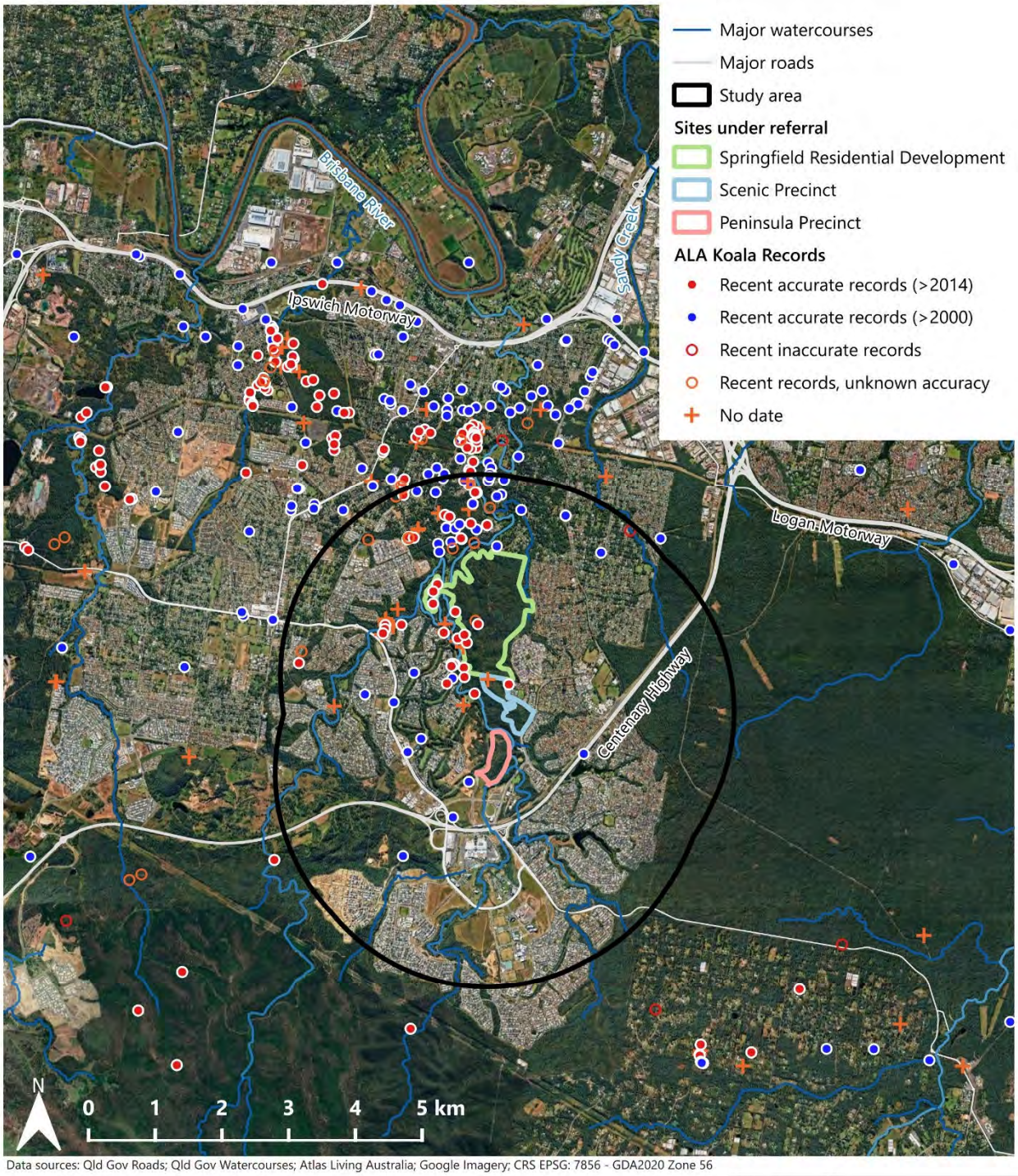
The number of records, particularly at the site locality is considered low given the location and size of the available habitat. Considering the terrain and accessibility of this area, with only limited walking trails and Council management tracks existing, it is likely that this is an underrepresentation of Koala records, particularly as Koala sightings decrease with distance from roads and human habitation (e.g., see Dissanayake et al., 2019).

While reduced records can be attributed to the limited access, the records are consistent with:

- The results of ICC OWAD Koala Detection Dog Surveys in 2015 as mapped and included in the ICC Koala Conservation and Habitat Management Plan; and
- Spot Assessment Technique Surveys undertaken by the Saunders Havill Group as part of the MNES surveys and PD Submissions for the Springfield Residential Development.

The majority of ALA records in the study area are located to the north of the referral sites and the Springfield Residential Development. However, the majority of these are >10 years old (**Figure 1**), with significant development occurring since then. More recent records are clustered in remaining, fragmented remnant and/or mature regrowth vegetation, such as the Opossum Creek and Woogaroo Creek riparian corridors.

The increase in recent records of Koalas in and/or immediately adjacent to the referral sites may be a result of increased community stakeholder awareness in the projects and active campaigns to record and register sightings in the local landscape.



Data sources: Qld Gov Roads; Qld Gov Watercourses; Atlas Living Australia; Google Imagery; CRS EPSG: 7856 - GDA2020 Zone 56



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Figure:	1
Title:	Referral Sites and Study Area
Project:	Scenic and Peninsula Precincts Koala Analysis
Client:	Saunders Havill Group
Drawn:	EW 05/08/2026
Checked:	AC

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Koala Food and Shelter Habitat

Towards identification of the local habitat values, we reviewed the local Koala preference of tree species against the mapped Koala habitat REs to establish the presence of Koala habitats and overall values. In particular, we used the Ipswich City Council (ICC) Important Koala trees in Ipswich (as per ICC Koala Friendly Planting Guide; ICC 2025), which identifies the following species as primary habitat trees:

- Queensland Blue Gum (*Eucalyptus tereticornis*)
- Gum-topped box (*Eucalyptus moluccana*)
- Tallowwood (*Eucalyptus microcorys*)
- Small fruited Grey Gum (*Eucalyptus propinqua*)
- Queensland Grey Gum (*Eucalyptus major*)
- Scribbly Gum (*Eucalyptus racemosa*)
- Yellow Box (*Eucalyptus melliodora*)
- Narrow-Leaved Red Gum (*Eucalyptus seeana*)
- Grey Gum (*Eucalyptus biturbinata*)

And the following as shelter or secondary Koala food trees:

- Narrow Leaved Ironbark (*Eucalyptus crebra*)
- Spotted Gum (*Corymbia citriodora* subsp. *variegata*)
- Broad Leaved Ironbark (*Eucalyptus fibrosa*)
- Brush Box (*Lophostemon confertus*)
- Pink Bloodwood (*Corymbia intermedia*)

Using this information, the remnant and regrowth regional ecosystems (REs, sourced from DNRMMRRD, 2026) occurring with the study area were categorised into primary, secondary and non-Koala habitats (**Table 2**, **Figure 2**). This indicated that Koala habitat within the Scenic and Peninsula Precinct proposed development areas is characterised as secondary Koala habitat, with REs that are not dominated by preferred forage tree species. In contrast, riparian vegetation along Woogooroo Creek and Opossum Creek supports primary Koala habitat, where preferred forage tree species dominate the canopy.

However, it should be noted that determining good Koala habitat by relying on the presence of a few preferred tree species is generally too simplistic, especially as Koalas can show a variance in species preference between individuals (Rhodes et al., 2015). Additionally, DCCEEW's definitions for Koala habitat based on guidance material includes areas which are not mapped by State and/or Local Government's or where trees occur in more sporadic densities where barriers do not occur.

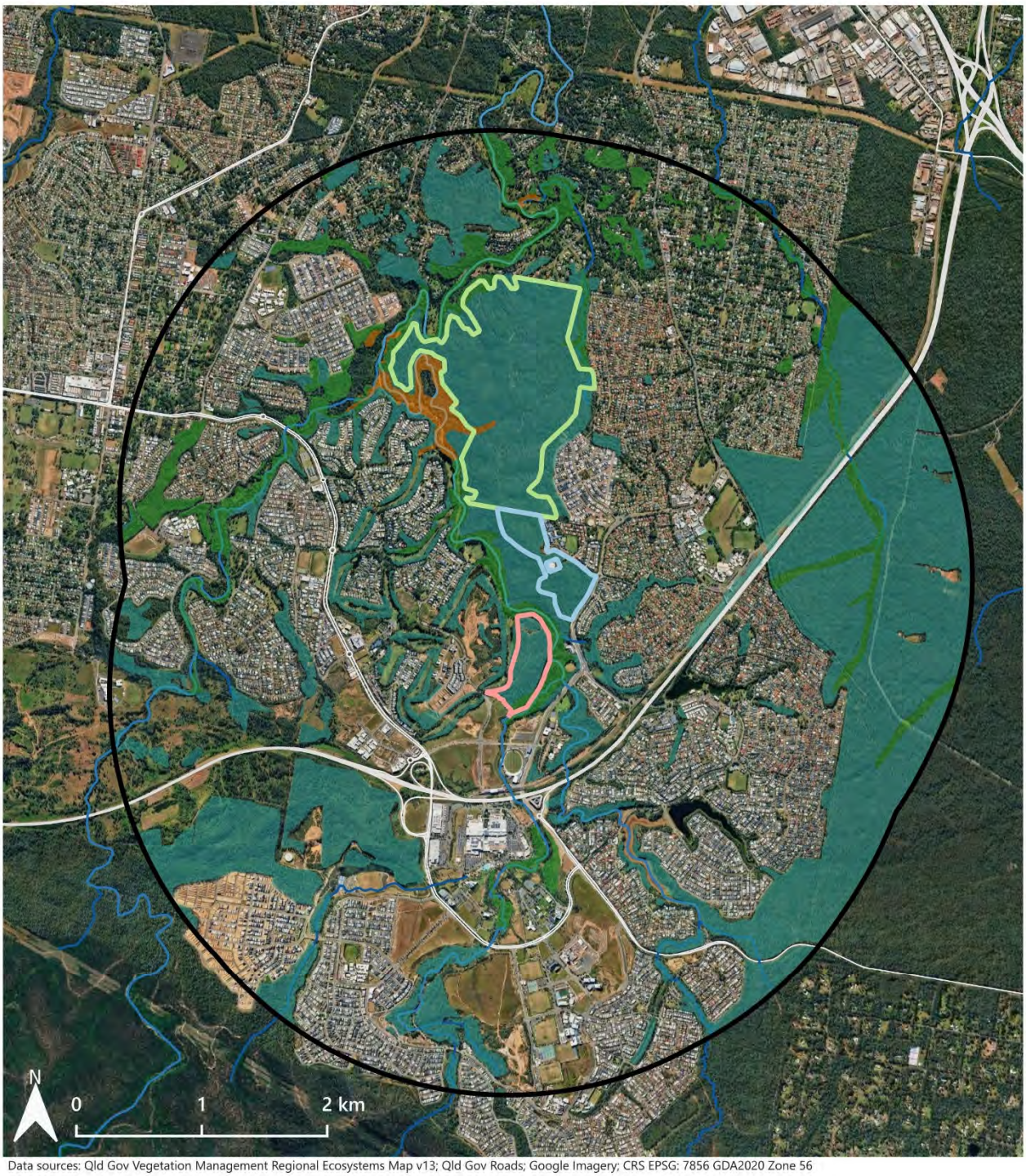
In terms of Koala habitat in other residential developments within the study area, **Figure 3** provides the resultant landscape of the current application sites (EPBC 2020/8651 and EPBC 2020/8629) and the nearby Springfield Residential Development (EPBC 2019/8575). It is noted the retained habitats are configured to provide connected habitats of primary Koala habitat along Woogaroo Creek, Opossum Creek, Mountain Creek and O'Dwyer's Gully, and the species is known to occupy these locations.

Table 2. Dominant regional ecosystems (REs) within the referral sites, including Koala primary food tree species (bold and underlined), and shelter or secondary food tree species (bold). Primary habitat includes REs with primary food trees as the dominant vegetation; secondary habitat contains shelter and/or secondary food trees as dominant; non-habitat REs do not have Koala habitat tree species in the dominant vegetation. The classification of RE use by Koalas in the Spatial modelling for Koalas in South East Queensland (DES, 2023) is also provided in parentheses.

RE (Koala habitat)	**Short Description**	**Description**
Within Scenic and/or Peninsular Precincts		
12.3.11 (Primary habitat / High)	*Eucalyptus tereticornis* +/- *Eucalyptus siderophloia, Corymbia intermedia* open forest on alluvial plains usually near coast	***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.
12.9-10.2 (Secondary habitat / Medium)	*Corymbia citriodora* subsp. *variegata* +/- *Eucalyptus crebra* open forest on sedimentary rocks	***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.
12.9-10.7 (Primary habitat / Medium)	*Eucalyptus crebra* +/- *E. tereticornis, Corymbia tessellaris, Angophora* spp. and *E. melanophloia* woodland on sedimentary rocks	***Eucalyptus crebra*** +/- ***E. tereticornis,*** *Corymbia tessellaris, Angophora leiocarpa, E. melanophloia* woodland. Occurs on Cainozoic and Mesozoic sediments.
12.9-10.19a (Secondary habitat / Medium)	*Corymbia henryi and/or Eucalyptus fibrosa* subsp. *fibrosa* open forest	*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.

Table 3. Additional regional ecosystems in the study area, with short description and Koala habitat classifications (as per Table 1).

RE	Short Description	Koala Habitat	SEQ Modelling Classification
12.3.3	***Eucalyptus tereticornis*** woodland on Quaternary alluvium	Primary	High use
12.3.6	*Melaleuca quinquenervia* +/- ***Eucalyptus tereticornis,*** *Lophostemon suaveolens,* ***Corymbia intermedia*** open forest on coastal alluvial plains	Primary	Medium use
12.3.7	***Eucalyptus tereticornis,*** *Casuarina cunninghamiana* subsp. *cunninghamiana* +/- *Melaleuca* spp. fringing woodland	Primary	Medium use
12.3.16	Complex notophyll to microphyll vine forest on alluvial plains	Non-habitat	Very low use
12.5.3a	Mixed woodland to open forest usually containing ***Corymbia intermedia,*** ***Eucalyptus racemosa* subsp. *racemosa*** and at least a presence of ***Eucalyptus seeana***	Primary	Medium use
12.8.24	***Corymbia citriodora subsp. variegata*** open forest on Cainozoic igneous rocks especially trachyte	Secondary	Low use
12.9-10.3	***Eucalyptus moluccana*** open forest on sedimentary rocks	Primary	Medium use
12.9-10.12	Mixed woodland usually containing ***Corymbia intermedia,*** *Angophora leiocarpa* and at least the presence of ***Eucalyptus seeana*** on sedimentary rocks	Secondary	Medium use
12.9-10.15	Semi-evergreen vine thicket with *Brachychiton rupestris* on sedimentary rocks	Non-habitat	Very low use
12.9-10.17a	***Lophostemon confertus*** or *L. suaveolens* dominated open forest usually with emergent *Eucalyptus* and/or *Corymbia* species.	Secondary	Low use
12.9-10.17b	***Corymbia citriodora subsp. variegata*** mixed open forest to woodland.	Primary	High use
12.9-10.17d	Open forest generally containing *Eucalyptus siderophloia*, ***E. propinqua*** or ***E major***, ***Corymbia intermedia***.	Primary	High use
12.9-10.19	***Eucalyptus fibrosa subsp. fibrosa*** woodland on sedimentary rocks	Secondary	Medium use



Data sources: Qld Gov Vegetation Management Regional Ecosystems Map v13; Qld Gov Roads; Google Imagery; CRS EPSG: 7856 GDA2020 Zone 56

Koala Habitat Classifications

- Primary
- Secondary
- Non-habitat

- Major watercourses
- Major roads

Sites under referral

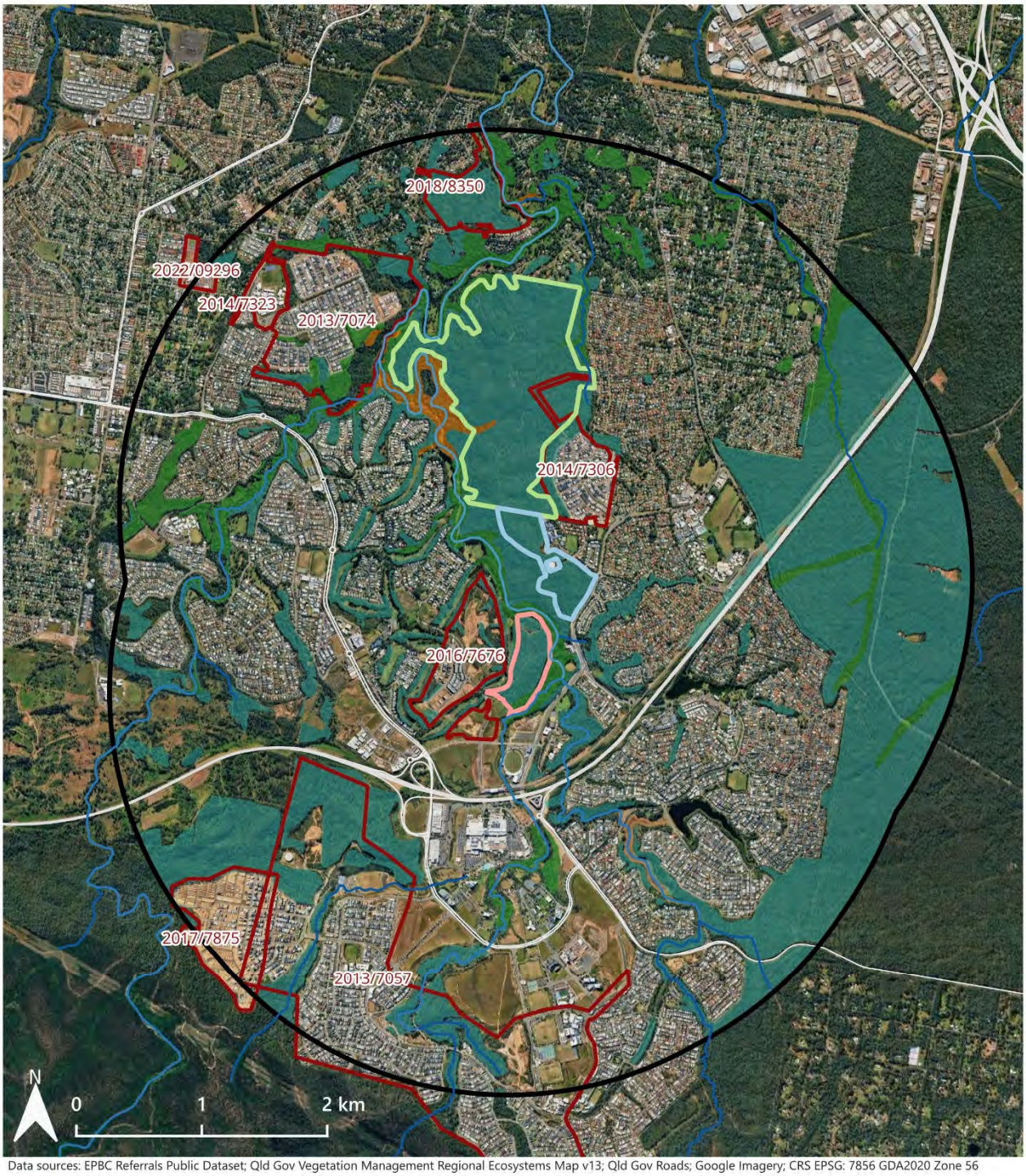
- Peninsula Precinct
- Scenic Precinct
- Springfield Residential Development

- Study area

Figure:	2
Title:	Koala Habitat
Project:	Scenic and Peninsula Precincts Koala Analysis
Client:	Saunders Havill Group
Drawn:	EW 05/08/2026
Checked:	AC

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Data sources: EPBC Referrals Public Dataset; Qld Gov Vegetation Management Regional Ecosystems Map v13; Qld Gov Roads; Google Imagery; CRS EPSG: 7856 GDA2020 Zone 56

Koala Habitat Classifications

- Primary
- Secondary
- Non-habitat

Sites under referral

- Peninsula Precinct
- Scenic Precinct
- Springfield Residential Development

- Major watercourses
- Major roads

- Study area
- Approved residential developments

Figure:	3
Title:	Residential Developments and Koalas
Project:	Scenic and Peninsula Precincts Koala Analysis
Client:	Saunders Havill Group
Drawn:	EW 05/08/2026
Checked:	AC

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Koala Dispersal Habitat Definition

Under the EPBC Act, there is no standalone statutory definition of **"Koala Dispersal Habitat"**. Instead, the concept is captured within the broader definition of Koala habitat and through the assessment of habitat connectivity and movement corridors that enable Koalas to move between habitat patches.

The clearest current Commonwealth guidance is in - Identifying habitat for the endangered Koala (2025)[1]. It states that Koala habitat includes not only occupied forest but also land used for movement between habitat patches. Specifically, Koala habitat includes:

- Forests and woodlands containing feed trees,
- Roadside vegetation, railway vegetation and paddock trees,
- Safe intervening ground used for travelling between trees and habitat patches, and
- Vegetated corridors or paddock trees that facilitate movement between habitat patches.

The guidance further states that, habitat should be assumed where land is likely to be utilised for Koala movement. Walking on the ground is how Koalas typically travel between trees, so the ground itself forms an essential component of Koala habitat, as without the ground, movement between trees would be hindered or impossible.

A practical EPBC definition often used by ecologists is:

- Koala dispersal habitat is habitat that enables Koalas to move between occupied or potentially occupied habitat patches and maintain connectivity between populations, even where the area is not itself core breeding or feeding habitat.

Within the study area we have identified urbanised landscape as Koala **dispersal habitat** where it occurs within 2 km of mapped or known Core Koala Habitat and retains characteristics that may facilitate Koala movement through the broader landscape. Koalas in Southeast Queensland often utilise fragmented habitats within urban landscapes and readily disperse through highly modified and hazardous areas, including major roads (including motorways), rail lines (including heavy and light rail), and residential areas, where risks including swimming pool drownings and dog attacks are present. While these areas may not constitute core habitat or support a resident breeding population and present elevated threats to dispersing Koalas from vehicle strike, and habitat fragmentation impacts associated with urban development, the EPBC Act guidance recognises that habitat includes land that provides connectivity between habitat patches and enables dispersal, foraging and recolonisation processes.

The Commonwealth's Identifying Habitat for the Endangered Koala guidance states that Koala habitat is landscape-context dependent and includes areas that provide safe intervening ground for travel, access to corridors and movement pathways between habitat patches. The guidance further notes that unoccupied habitat may still be considered habitat and that occupancy should be assumed where habitat attributes are present or where areas are likely to be used for Koala movement.

Given the proximity to core habitat (within 2 km), these urbanised areas are well within the movement (dispersal) capability of Koalas. Dispersal movements, particularly by sub-adult

[1] https://www.dcceew.gov.au/environment/epbc/publications/identifying-habitat-for-the-endangered-koala

animals, can extend across fragmented and modified landscapes, including urban environments, where remnant trees, roadside vegetation, scattered feed trees and other vegetated elements provide stepping-stone connectivity. Consequently, urbanised land can, to various degrees pending landscape and fence types, contribute to connectivity of the Koala habitat network even where vegetation condition is highly modified.

Accordingly, the urbanised landscape has been classified as Koala dispersal habitat due to its location within 2 km of core habitat, together with its potential role in facilitating Koala movement and maintaining landscape connectivity, as it contributes to the broader habitat network that supports the long-term viability and recovery of the endangered Koala under the EPBC Act. This is also relevant for mapped rainforest and vine dominant habitat which has also been included as dispersal habitat.

Within the study area, sections of the Centenary Motorway have been considered within potential Koala dispersal habitat as it is not considered to constitute a complete barrier to Koala movement, with opportunities for individuals to traverse the corridor. However, the motorway may still act as a movement constraint due to the elevated risks associated with crossing. The motorway corridor also contains fauna underpasses and associated vegetated linkages (to varying degrees), which provide opportunities for Koalas to move beneath the roadway.

In addition, there are numerous sections where adjoining vegetation and open verge areas allow Koalas to access and traverse the corridor, increasing the likelihood of movement between habitat patches. Although the motorway presents significant risks to dispersing Koalas, including vehicle strike, the presence of crossing opportunities and the absence of extensive physical barriers along much of the corridor mean that some connectivity is retained. While these crossing opportunities may be limited to small drainage culverts or unfenced sections of the motorway corridor and may expose dispersing Koalas to an elevated level of risk, the Springfield Motorway is nevertheless considered permeable to Koala movement. Therefore, it is considered capable of facilitating dispersal and maintaining landscape connectivity between areas of core habitat and has been included within the dispersal habitat network.

Functional Connectivity Review

An assessment was also undertaken of potential Koala habitat within and surrounding the referral sites, categorised as food/shelter or dispersal habitat.

Suitable habitats within the study area were determined and used for review and analysis. **Food/shelter habitat** was determined by extracting remnant or regrowth REs classified as either high, medium or low suitability for Koala, as per the *Spatial Modelling for Koalas in South East Queensland* (DES, 2023). Areas apparent on satellite imagery that have subsequently been developed were removed from Koala food/shelter habitat but may still constitute dispersal habitat. Pre-clear RE mapping was used to determine potential **dispersal habitat**, with the REs suitable for Koala (as above) included.

It should be noted that there are some small areas mapped as non-remnant which now are treed. Although these areas are not formally mapped as remnant or regrowth, they would be considered to achieve the definition of food/shelter habitat for Koala based on Commonwealth Government Guidelines. We note that there are limited Koala records in these areas.

Within the 4,141.7 ha of the study area, approximately 33% is considered likely to meet the above definition of food/shelter habitat for Koalas (**Table 3, Figure 4**). A further 55% may be attributed to dispersal habitat (non-remnant Koala habitat REs); however, much of this is highly urbanised which would increase the risk of mortality from dogs, vehicle strike, or have barriers in

the forms of high backyard fencing. The remainder of the study area is comprised of REs of very limited or negligible value to Koala.

Scenic and Peninsula Precincts comprise 0.6% and 0.5% of the study area size. Removal of the entire referral area associated with these two developments would reduce Koala forage/shelter habitat within the study area by approximately 3%, and dispersal habitat by 0.06%.

Other residential developments reviewed contain ~10% of the Koala forage/shelter habitat in the study area (at Springfield Residential Development, which is currently under assessment), and 11% within several residential developments approved since 2010. These proportions are based on current vegetation mapping, noting that Koala habitat within previously approved development footprints has largely been removed.

Table 3. Size of referral areas for residential development within the study area, as well as Koala habitats.

Area	Total Referral Area (ha)	Koala Forage /Shelter Habitat (ha)	Koala Dispersal Habitat (ha)
Study area	**4,141.7**	**1,353.2**	**2,788.5**
Scenic Precinct	24.2 (0.6%)	22.9 (0.6%)	1.3 (0.06%)
Peninsula Precinct	18.9 (0.5%)	17.1 (0.4%)	0.02 (<0.001%)
Springfield Residential Development (EPBC 2019/8575)	134.9 (3.3%)	134.6 (10.0%)	0.3 (0.01%)
Other approved residential developments	597.2 (14.4%)	149.7 (11.0%)	145.7 (6.4%)



Data sources: EPBC Referrals Public Dataset; Qld Gov Vegetation Management Regional Ecosystems Map v13; Qld Gov Roads; Google Imagery; CRS EPSG: 7856 GDA2020 Zone 56

Koala habitat
- Forage/Shelter
- Major watercourses
- Major roads

Sites under referral
- Peninsula Precinct
- Scenic Precinct
- Springfield Residential Development
- Study area
- Previous residential referral sites

Figure:	4
Title:	Koala Forage/Shelter and Dispersal Habitats
Project:	Scenic and Peninsula Precincts Koala Analysis
Client:	Saunders Havill Group
Drawn:	EW 03/09/2026
Checked:	AC

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Barrier and Connectivity Analysis

Queensland Government spatial data for railways, motorways, highways and busways were also used to determine movement barriers in the landscape. Other roads were considered unlikely to form complete barriers, although may inhibit dispersal and safe movement. In accordance with the Commonwealth's definition of barriers to Koala movement, only major roads with physical barriers, heavy rail line with physical barriers (if relevant), and dense established housing with no habitat trees are considered formal barriers. For this exercise barriers focussed on the 'likely' inhibition of safe Koala movement, not the complete removal of movement. Additionally, Koala habitat and corridors outside the functional connectivity study area (used to analyse the local population) were considered, to provide information on capacity for dispersal for breeding (and gene flow) or new areas by young Koalas.

Koala movement to the large tract of remnant vegetation in the Greenbank Military Range, approximately 2 km to the east of the referral sites, is limited by military fencing, the Centenary Motorway (a dual carriageway with cement barriers) and the Springfield rail line (with chain-link fencing ~2 m in height). There are also areas between the site and the Greenbank Military Range with established residential housing.

While the Centenary Motorway curves and continues west approximately 600 m south of Peninsula Precinct, and south-west of the referral sites, the road narrows to a single carriageway with no cement barriers, thereby providing fewer barriers to Koala movement. Several riparian underpasses are also present south of Peninsula Precinct, including approximately 30 m wide structures centred on Mountain Creek and Opossum Creek. These two underpasses which have been partially cleared and contain scattered trees provide for movement along the retained vegetation corridor that links the Scenic and Peninsula Precincts with the retained areas for the Springfield Residential Development to the north, thereby providing for Koala movement to occur under the roadway. The Opossum Creek underpass has treed vegetation up to the railway and motorway overpasses, further enhancing its function as a movement corridor. As the rail line also terminates at Springfield, it does not restrict Koala dispersal to the south-west.

Within the central part of the study area, the 27.5 ha of planned retention for the Springfield Residential Development area incorporates riparian corridors including Woogaroo and Opossum Creeks, as well as the adjoining habitat included at Broadwater Golf Course. These areas consist of connected high-value Koala habitats and is also where the majority of Koala observations have been recorded (see **Figure 1** above). As such, the retained corridors provide an interconnected landscape providing movement corridors and feeding habitats. These linkages also benefit from reduced levels of recognised threats, particularly vehicle strike and domestic dog attack, within these locations.

The planned retention corridors provide direct connectivity to the retained Koala habitats to the north of the referral sites, where recent Koala records are most common, and habitats south of the Centenary Motorway via the Opossum and Mountain Creek riparian underpasses. Review of **Figure 3** shows the resultant landscape provides for Koala movement through the retained corridor network. Site inspections indicated that these retained habitats provide a considerable feeding resource (dominated by *Eucalyptus tereticornis*) and are configured so that Koalas can move readily through these corridors. The retained habitats provide ongoing habitat and habitat connections for the species.

The proposed Scenic and Peninsula Precincts will result in an overall reduction of ~1% Koala forage and/or shelter habitats, and fragment habitat outside the retained corridors within the study area. Decreased habitat and connectivity leads to longer and more direct movements by Koalas over ground due to competition and territoriality (Rus et al., 2020), which increases risk of injury or death by dogs and vehicles.

Population Sustainability

Habitat loss reduces population sizes, leading to species loss at different points along the habitat loss gradient. The extinction threshold is the minimum habitat required for a species to persist in a landscape—below this, long-term survival is unlikely. Populations can only persist if reproduction matches or exceeds mortality (McAlpine et al., 2005).

As habitat declines, landscape-scale mortality increases relative to reproduction. Human-associated threats (e.g., dogs, cars, fires) accelerate population decline in Koalas (McAlpine et al., 2005). More fragmented landscapes, such as those in urban and peri-urban areas, also require greater habitat retention due to:

1. Reduced colonisation rates,
2. Increased edge effects and separation, raising the risk of individuals entering hostile environments, and
3. Species-specific responses based on life history traits.

A global review of wildlife (Andrén, 1994) identified 30% habitat retention as a critical threshold. Species loss occurs above this level, but below it, landscape configuration (e.g., patch connectivity) becomes more important than habitat amount. However, Andrén suggested that the quality of the surrounding landscape matrix had little effect on extinction thresholds.

Koala population density in the study area has been estimated between <0.0001 Koala/ha (or <0.01 Koala/km^2, Dissanayake et al., 2021) and 0.008 Koala/ha (or 0.8 Koala/km^2, Rhodes et al., 2015). Various studies have indicated that temperature is a determinate of Koala density and may be the reason for the low Koala density in Ipswich (Rhodes et al., 2015).

Koalas are more likely to persist in landscapes with large patches (>100 ha) of >50% high-quality habitat, with a low density of sealed roads (McAlpine et al, 2005). We note that the total size of the Scenic and Peninsula Precincts, and adjacent Springfield Residential Development currently under assessment, is >200 ha, with limited sealed roads. Whilst the referral sites do comprise a large bushland block, we view much of the site as comprising secondary habitat (Spotted Gum *Corymbia citriodora* subsp. *variegata* dominated woodlands on sedimentary rocks) when compared with the lower slopes and riparian areas where higher value habitats (Queensland Blue Gum *Eucalyptus tereticornis* dominated REs) occur. This is further highlighted by the location of Koala records within the study area (refer **Figure 2**).

Although the majority of the referral sites are considered to comprise of a large patch of 'secondary habitat' (refer **Figure 2**), it does contain suitable habitat for the species to persist, seek refuge and traverse. The Scenic and Peninsula Precincts will result in the loss of 40 ha of Koala food/shelter habitat, which is ~1% of the total Koala food/shelter habitat within the examined home range study area (e.g., **Figure 2**). A further 134.6 ha of Koala food/shelter habitat (10% of the home range) is contained within the Springfield Residential Development currently under assessment, with a further 149.7 ha (11%) previously approved (see **Table 3, Figures 3-4** above).

The loss of the proposed impact areas, in combination with other referrals and/or approvals, is expected to result in a reduced Koala population due to decreased habitat availability within the home range study area and the broader landscape. The retained habitats, including considering other EPBC development referrals and/or approvals, remains relatively well connected, though large core habitat areas are reduced. The habitat connections retained are dominated by high value habitats (Qld Blue Gum dominated) along waterways where higher moisture and nutrient values are present.

We note that the proposed impacts are also required to provide an offset, which is being delivered elsewhere, though will contribute to the species within south-east Queensland.

Based on the retained habitat connections and the greater functional connectivity study area containing 1,353.2 ha of koala food/shelter habitat (based on remnant and regrowth RE mapping), we consider a viable population will persist in the eastern Ipswich local government area.

Summary and Conclusion

There is little known about the actual population densities within the local landscape, and it is likely these vary between the various habitats due to the relative values (primary or secondary food trees), extent of weeds and/or barriers to or through the location.

Whilst there is a network of habitat connections retained, the potential loss of 229.9 ha of Koala food/shelter habitat (through the referral sites and other EPBC approvals and applications) effectively results in a landscape which comprises a series of linear corridors between retained core patches.

These core patches would also be linear in shape, and therefore subject to edge effects. It is expected that ongoing genetic exchange can occur, as there is connectivity through riparian corridors beyond the study area, although these connections are compromised, to varying degrees, by urbanisation and roadways, and the subsequent mortality risk.

Overall, the resultant landscape of the study area is viewed as comprising sufficient habitat and habitat connections for the species to persist, although the population size can be reasonably expected to be reduced, due to the removal of Koala food/shelter habitats on the referral sites.

Our analysis has found that within the study area, there is currently 1,353.2 ha of Koala food/shelter habitat (based on remnant and regrowth RE mapping). Whilst much of the retained habitats are associated with waterways, we note that these creek corridors retain the highest density of primary food trees, when compared with the prevalence of secondary koala trees in the referral impact areas.

The referral areas have been proposed and approved for development for over 25 years as part of the latest and final components of the long-standing Springfield Structure Plan. As a result, retention of Koala habitat in this location is not planned for or supported by local government investment through the ICC's Koala Conservation and Habitat Management Plan.

Ongoing maintenance of the retained habitats and connections would be integral, particularly relating to weed management and the prevention of barrier formation, ensuring the corridors remain viable connections within which Koalas can readily traverse. Future upgrade of roadways intersecting retained corridors should seek to maximise safe movement for the species.

Overall, our review has found there is considerable development within the study area and surrounds that have and continue to reduce habitat availability and connections and will result in a reduced Koala population. There is sufficient habitat and connections retained for the species to persist within the functional connectivity study area, although the long-term presence of Koalas within the local landscape is likely to be reliant on continued connections including provision of dedicated movement facilities across major roadways, beyond the study area as a source of recruitment. Many of the identified connections are expected to be retained in the long term as they are either conservation land, Commonwealth lands or outside of the urban footprint.

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Attachment A5

Wildlife Aerial Thermal Imagery Analysis

Wildlife Aerial Thermal Survey

Introduction

Saunders Havill Group were tasked with spotting *Petauroides volans* (Greater Glider). The following steps were undertaken in the preparation of this document.

1. Flight Planning
2. Field Data Collection
3. Desktop Processing
4. Survey Results

Details of the methodology undertaken for each of these phases is provided below.

I. Flight Planning and Approvals

A detailed site assessment was conducted across the project area to identify suitability for Greater Glider thermal sensor spotting. Items included airspace, landfall and vegetation mass to determine suitability. Additional elements of influence regarding safe and successful flight also included risk management factors, CASA air laws and regulations and RPA standard operating procedures that may influence outcomes. The following stages were undertaken:

- CASA compliance
- Airspace validation
- Weather check
- Day time Site assessment
- Risk Assessment
- Flight approvals

2. Field data collection

2.1. Site information

Location	Eden Station, Springfield QLD
Local Goverment	Ipswich Council
Topography	Undulating Terrain
Land/Property Access	YES
Site Manager	Brett Wilson, Springfield City Group
Site Stage	Investigation
Area	100 ha (site Specific)



2.2. Flight information

The project was divided into 4 flight areas due to terrain and ability to keep the RPA within line of sight.



RP *Remote pilot locations / Take off and Landing Area*
ALT *Alternative Landing Sites*

Site assessment flight was performed during daylight conditions prior to surveying each project area to establish flight paths for RPA, assess terrain for obstacles and areas of possible interference.

Wildlife survey was conducted during night-time (7PM-2AM) to fully utilize the thermal sensor. With this method we were able to search areas otherwise obstructed by vegetation by targeting heat signatures.
A combination of Autonomous flight and Manual RPA operation was used to undertake this thermal wildlife survey.
A waypoint mission was planned within DJ Pilot 2, software integrated into DJI remote controller used to operate DJI M300RTK.
Continuous visual monitoring of screen displaying the thermal video feed from the sensor was used as a primary detection method.
When suspicious thermal signature was detected, the RPA was put into “hover mode” to maintain position without further outputs from the pilot.
Thermal and RGB still images were captured for further analysis during the desktop processing.
After confirming the features of the image to be wildlife, several still images were taken to capture the subject from different angles. Direct overhead still image was also captured to provide GPS location.
After performing the capture, the pilot resumed automated flight along the predetermined flight path.
Frequent stops were necessary to observe for suspicious thermal signatures (other than target species) and assess whether closer inspection is necessary. (ie. Fast moving heat signatures could be classified as hare, making a closer inspection unnecessary).
Each flight was limited by RPA battery power. After each landing to reload charged batteries, the RPA would autonomously return to the last break point in the flight and resume the survey.
A thermal and RGB video was also captured for each flight.

Flight line direction	North to South (adjusted to site specifics)
Flight line overlap (side)	40% (Survey line width +/- 25 meters)
Survey altitude (AGL)	45-65m AGL
Inspection altitude (AGL)	20-30m AGL
Detection method (a)	Hot spot alert
Detection method (b)	Shape detection
Detection method (c)	Characteristic trait
Detection method (d)	Visual inspection
Total flight area	100 ha
Initial site inspection	7 September 2023
Flight dates 1	13 September 2023 (Flights aborted due to rain)
Flight dates 2	20 September 2023
Total Flights	18

2.3. Equipment information

RPA	DJI M300 RTK
Payload 1 Sensor	DJI H20T
Payload 2 Spotlight	Gl60+
Software	DJI Pilot 2

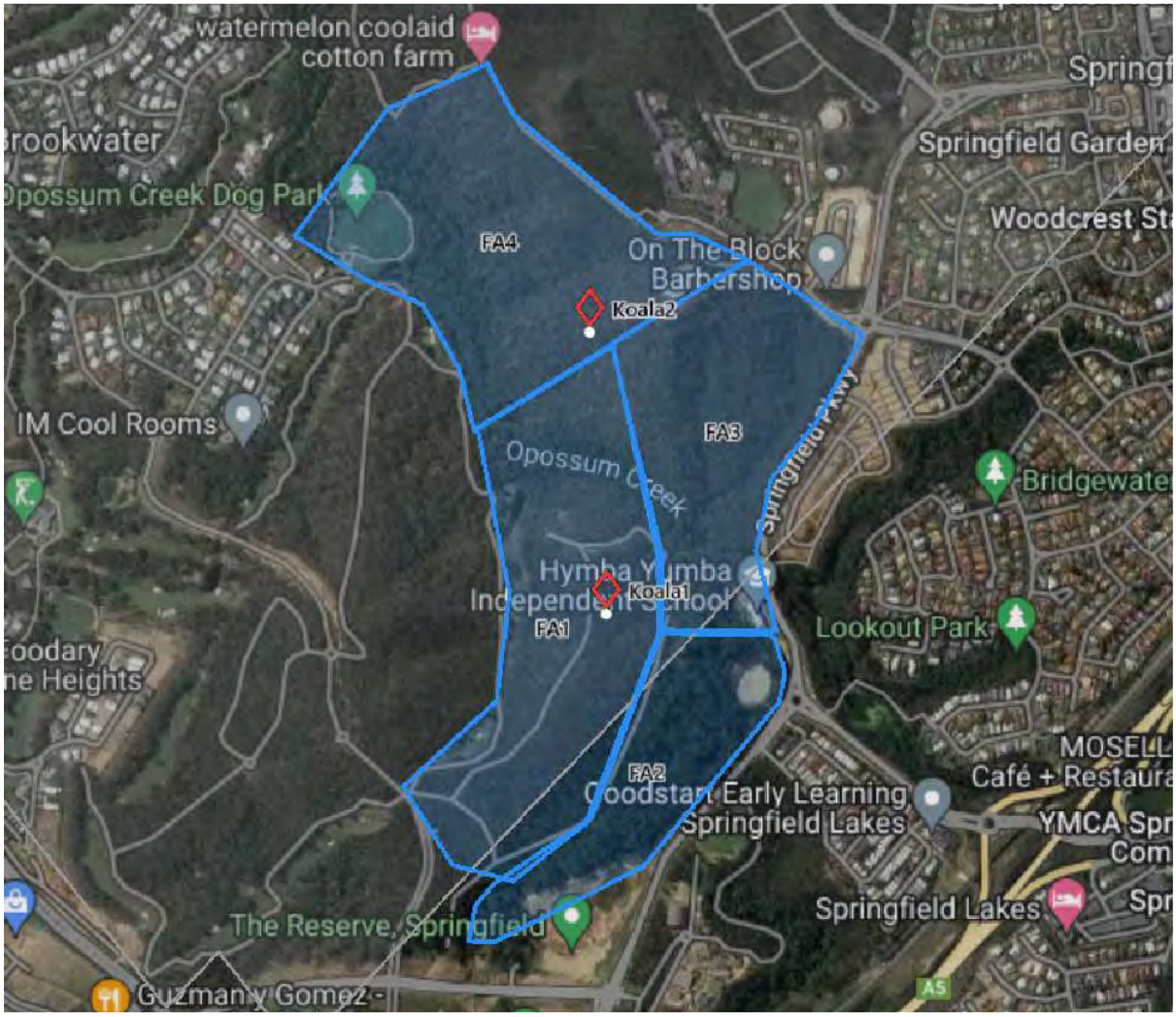
RPA	DJI M100
Payload 1 Sensor	DJI Zenmuse XT FLIR
Software	DJI Go

3. Desktop Processing

All survey data was captured onto SD card that is inserted into the RPA's sensor.

Each image that was captured directly overhead of target species is viewed and GPS coordinates from the image are used to create annotations for each finding.

A data set with all annotations is than exported as a KML file.



4. Survey Results

The aerial survey found several wildlife species within the entire project area. No target Species (Glider Greater) were detected.

Subjects were confirmed whilst airborne using several techniques including visual inspection, statistical temperature evaluation/alert, characteristic behavioural traits and fauna type investigation methods. Whilst every effort is made to confirm species and location, it is noted that some species were difficult to identify due to position in vegetation and uncharacteristic behaviour.

4.I. Detection Evidence Examples

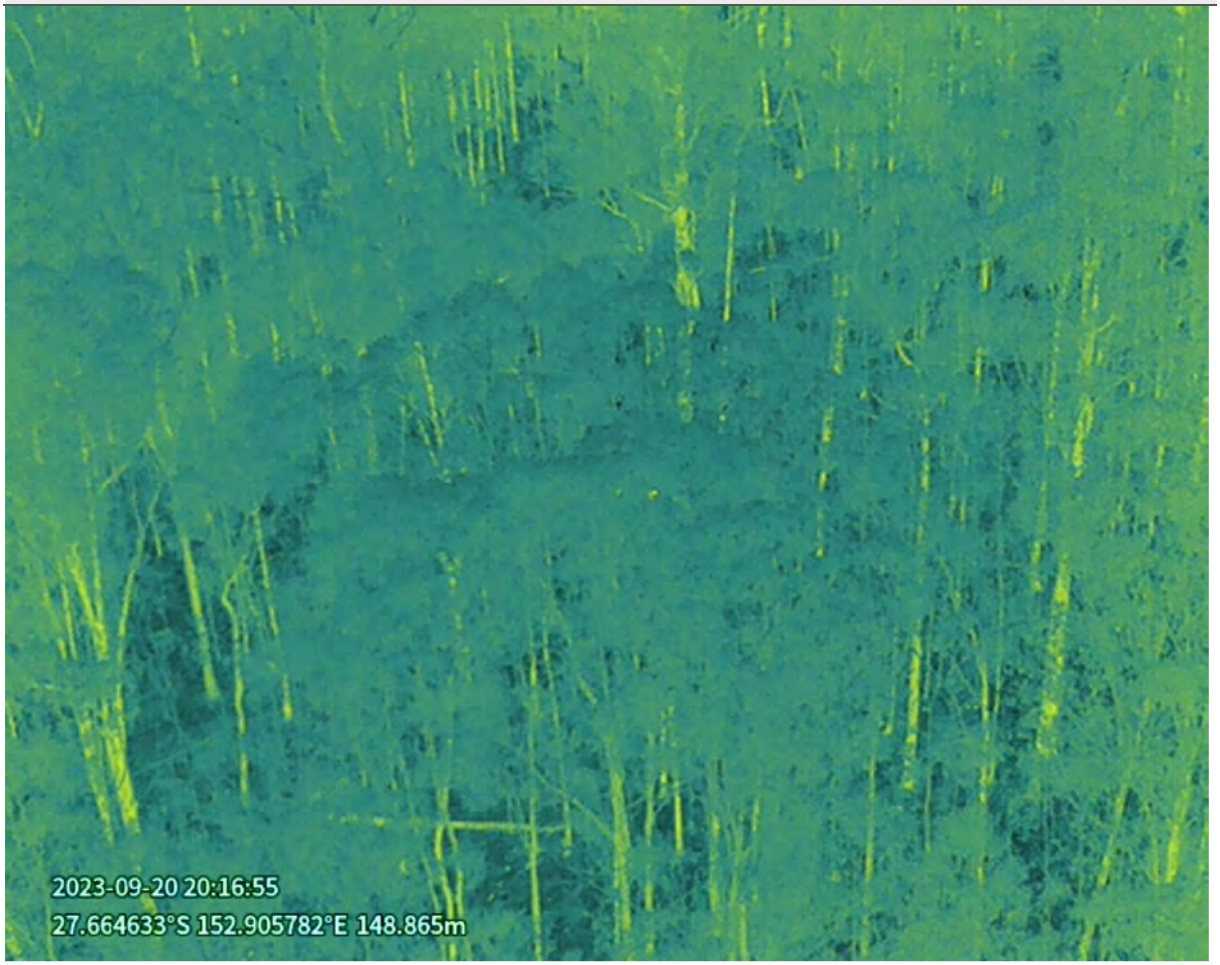
Example type 1 (Bat)	Raw Jpeg-R Thermal at distance as approaching (in flight video example). Standard in flight observation is in white hot and or black hot pallet with Isothermal properties activated. This allows the sensor to only show colour heat reflectance returns which isolate targets in the area.



Example type 2 (Bat)	RGB image (30xzoom) at distance captured simultaneously with Thermal video feed.



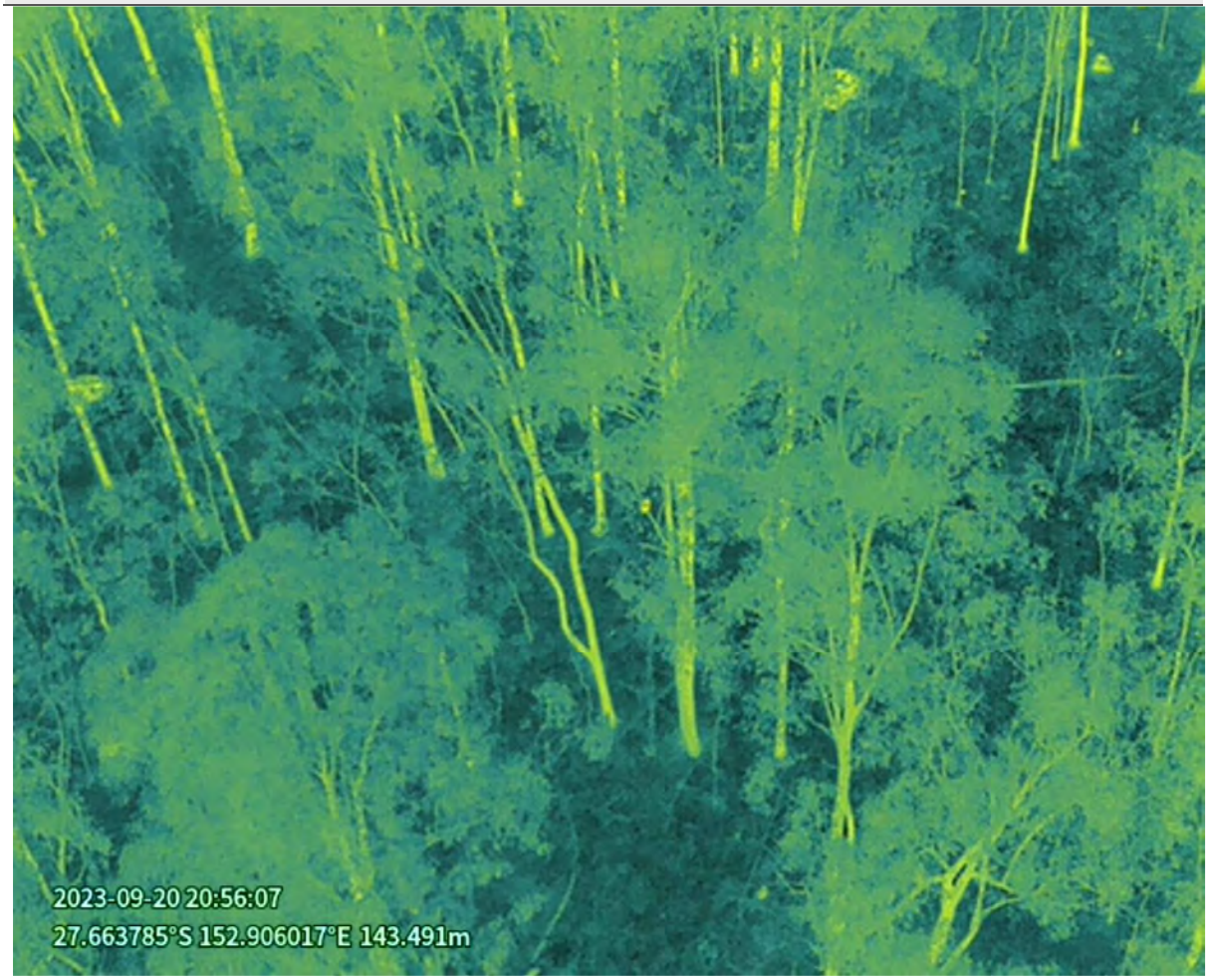
	Raw Jpeg-R Thermal at distance as approaching (in flight video example).
Example type 2 (Crows)	Standard in flight observation is in Arctic pallet with Isothermal properties activated. This allows the sensor to only show colour heat reflectance returns which isolate targets in the area.



Example type 2 (Crows)	RGB image (30xzoom) at distance captured simultaneously with Thermal and RGB video feed.



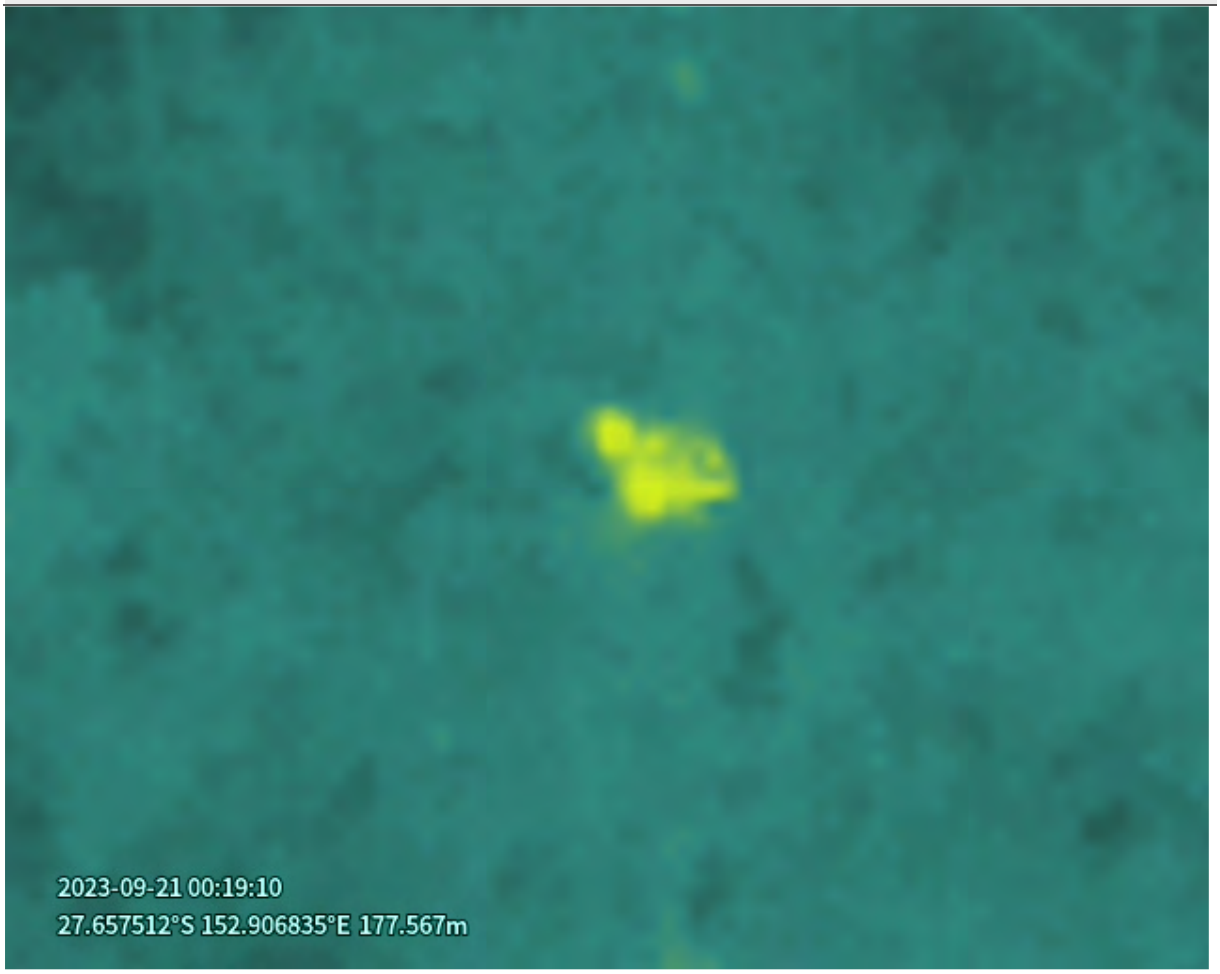
Example type 3 (Koala)	Raw Jpeg-R Thermal at distance as approaching (In-flight pallet change to better understand the observed subject). In-flight, sensor settings can be adjusted to better observe head reflectance subjects for further interrogation, in this instance Arctic pallet allows easy identification of hot spots comparative to surrounding environment. Note the para-heliotropic angle allows the trees appear ghosted with trunks behind easily viewable showing a semi-transparent ability to look through vegetation in areas where canopy volume is denser. This angle is considered for all thermal flights to give the highest look potential for species being detected.



Example type 3 (Koala)	RGB image (30xzoom) at distance captured simultaneously with Thermal and RGB video feed.



Example type 4 (Lorikeets)	Raw Jpeg-R Thermal (standard look angle observed whilst in inspection flight mode). Shapes are identified easier when closer In-flight inspection using thermal zoom mode (up to 8x).



Example type 4 (Lorikeets)	RGB image (30xzoom) at distance captured simultaneously with Thermal and RGB video feed.



	Coordinates	File Location
Koala 1	27.6640644070 S 152.905990601 E	DJI_202309201929_006_7399-Eden-Station—Springfield 20230920 DJI_20230920204307_0001_Z 20:55:33
Koala 2	27.6589622500 S 152.905654907 E	DJI_202309202359_008_7399EdenStationSpringfield-EdenStationFA4 20230921 DJI_20230921003733_0003_Z 00:56:30

Attachment A6

Greater Glider Connectivity Analysis

1.00 Greater Glider Corridor Analysis



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, 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 plan is approved, and may change when a full survey is undertaken. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill Group therefore disclaims any liability for any loss or damage whatsoever or howsoever incurred, arising from any party using or relying upon this plan for any purpose other than as a document prepared for the sole purpose of accompanying a development application and which may be subject to alteration beyond the control of the Saunders Havill Group. Unless stated otherwise, this is not an approved plan.

Layer Sources

© State of Queensland (Department of Resources) 2025. Updated data available at http://qldspatial.information.qld.gov.au/catalogue/

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

*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

- Referral Area
- Other EPBC Projects
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders
- Major roads
- Rail network
- Highway or 4-lane arterial road

Corridors for Analysis

- Corridor 1
- Corridor 2
- Corridor 3
- Corridor 4
- Connectivity assessment location
- Connectivity barrier locations



saunders havill group

SPRINGFIELD CITY GROUP

Peninsula Precinct

0 200 400 600 m

Transverse Mercator
GDA 2020 | Zone 56

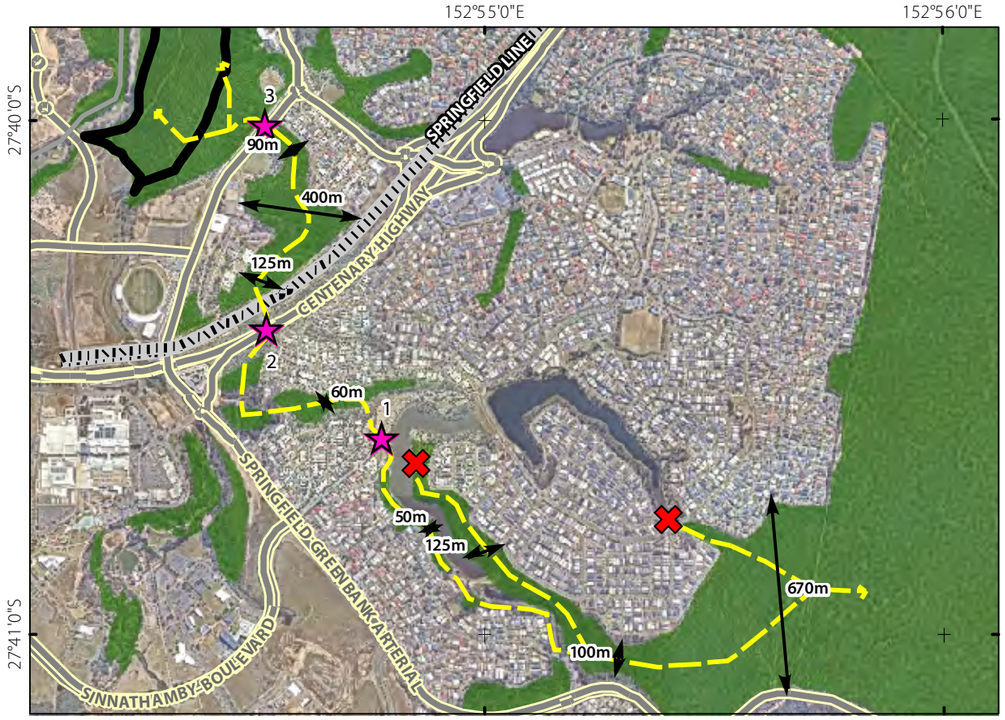
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@ A3

Address: 163/SP291400

7399 E A01_0 SFA GG Corridors A

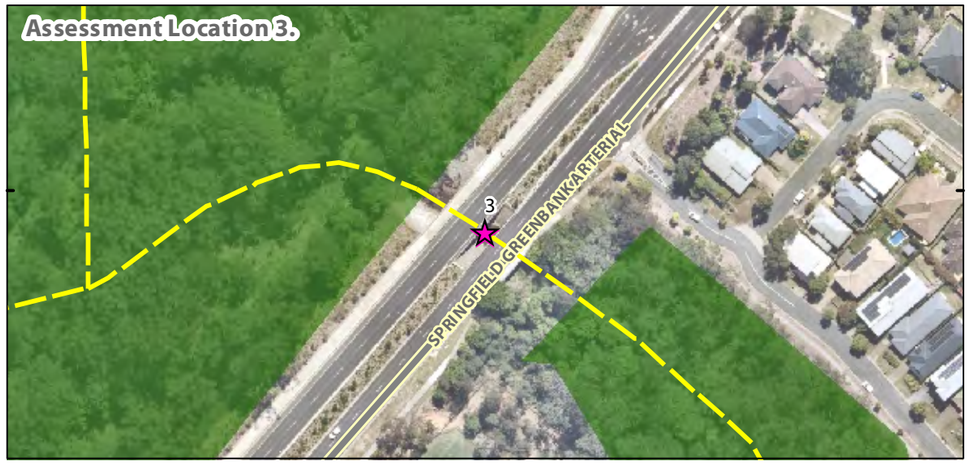
Issue	Date	Drawn	Checked
A	30/10/2025	TF	AW

1.01 Greater Glider Corridor Analysis (Corridor 1)









BARRIER ASSESSMENT

Photos are provided for the following locations:

1.Springfield Lakes Boulevard (-27.677007, 152.912897) –
Modified open parkland, street trees and detention basin adjoined by established residential communities.

2.Centenary Motorway and Rail Line (-27.673475, 152.908603) –
Two intersecting paths of major linear infrastructure. Vegetation between the Centenary Motorway and rail line is predominantly scattered regrowth with limited canopy coverage required for stepping stone connectivity. Approximate crossing distance from vegetation south of Centenary Motorway to north of the rail line is 135 metres.

3. Springfield Greenbank Arterial (-27.666898, 152.908576) –
Four-lane arterial road adjoined by non-remnant and remnant vegetation. Vegetation width approximately 100 metres at crossing location inclusive of regrowth and planted street tree vegetation. Approximate crossing distance is 60 metres. Vegetation broadens to the north-west of Springfield Greenbank Arterial.

Notes:
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Legend

- Referral Area
- Other EPBC Projects
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders
- Major roads
- Rail network

Corridors for Analysis

- Corridor 1
- Corridors 2-4
- Connectivity assessment location
- Connectivity barrier locations
- Greater Glider suitable Regional Ecosystems widths



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SPRINGFIELD CITY GROUP

Peninsula Precinct

0 200 400 600 m

Transverse Mercator
GDA 2020 | Zone 56

1:22,000 @ A3

Address: 163/SP291400

7399 E A01_1_1 SFA GG Corridors A

Issue	Date	Drawn	Checked
A	30/10/2025	TF	AW

1.02 Greater Glider Corridor Analysis (Corridor 1)

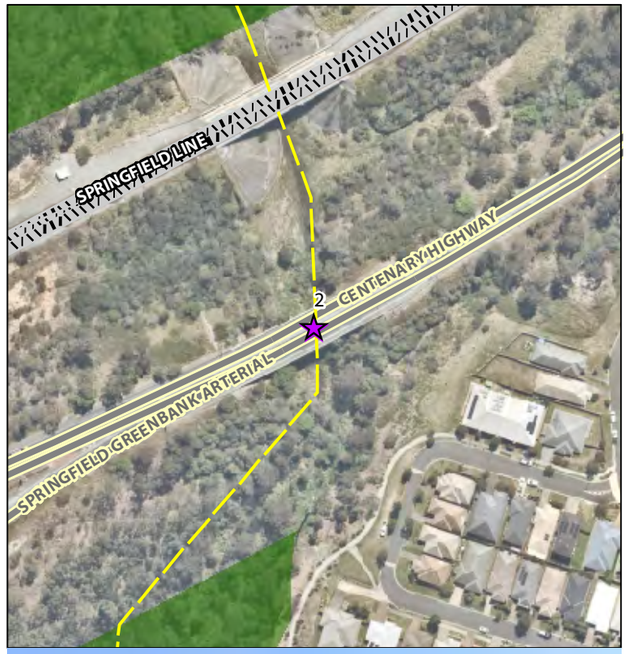
Assessment Location 1.







Assessment Location 2.







Assessment Location 3.







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Legend

- Referral Area
- Other EPBC Projects
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders
- Major roads
- Rail network

Corridors for Analysis

- Corridor 1
- Corridors 2-4
- Connectivity assessment location
- Connectivity barrier locations



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SPRINGFIELD CITY GROUP

Peninsula Precinct

0 10 20 30 40 50 m

Transverse Mercator
GDA 2020 | Zone 56

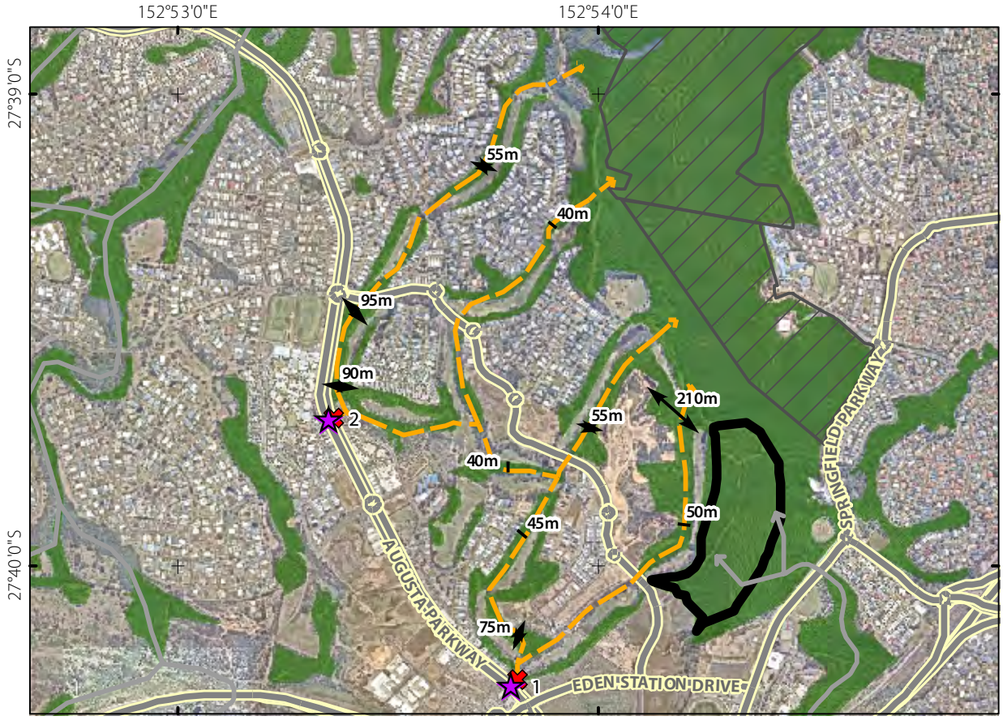
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Address: 163/SP291400

7399 E A01_1_2 SFA GG Corridors A

Issue	Date	Drawn	Checked
A	30/10/2025	TF	AW

1.03 Greater Glider Corridor Analysis (Corridor 2)





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BARRIER ASSESSMENT

Corridor 2 is entirely a minor internal corridor associated with the Brookwater Golf Course. The linkages are comprised of golf fairway which is skirted by narrow strips of remnant and regrowth vegetation. Corridors are intersected at multiple locations by residential roads including Brookwater Drive and Grangewood Avenue.

Corridor connections terminate at Augusta Parkway to the south-west. Identified locations highlighted as Assessment Locations 1 (-27.670685, 152.896264) and 2 (-27.660633, 152.889095). Augusta Parkway and surrounding development areas represent a major barrier due to the absence of vegetation to the immediate south-west and south-east thus disconnecting the minor golf course corridors from major habitat connections to the south-east or south-west.



Legend

- Referral Area
- Other EPBC Projects
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders
- Major roads

Corridors for Analysis

- Corridor 2
- Corridors 1 & 3-4
- Connectivity assessment location
- Connectivity barrier locations
- Greater Glider suitable Regional Ecosystems widths



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Peninsula Precinct

0 200 400 600 m

Transverse Mercator
GDA 2020 | Zone 56

1:24,000 @ A3

Address: 163/SP291400

7399 E A01_2_1 SFA GG Corridors A

Issue	Date	Drawn	Checked
A	30/10/2025	TF	AW

1.04 Greater Glider Corridor Analysis (Corridor 2)

Assessment Location 1.



Image 1. Facing North



Image 2. Facing South



Assessment Location 2.



Image 1. Facing North



Image 2. Facing West



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Legend

- Referral Area
- Other EPBC Projects
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders
- Major roads

Corridors for Analysis

- Corridor 2
- Corridors 1 & 3-4
- Connectivity assessment location - No connectivity
- Connectivity barrier locations



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Peninsula Precinct

0 10 20 30 40 50 m

Transverse Mercator
GDA 2020 | Zone 56

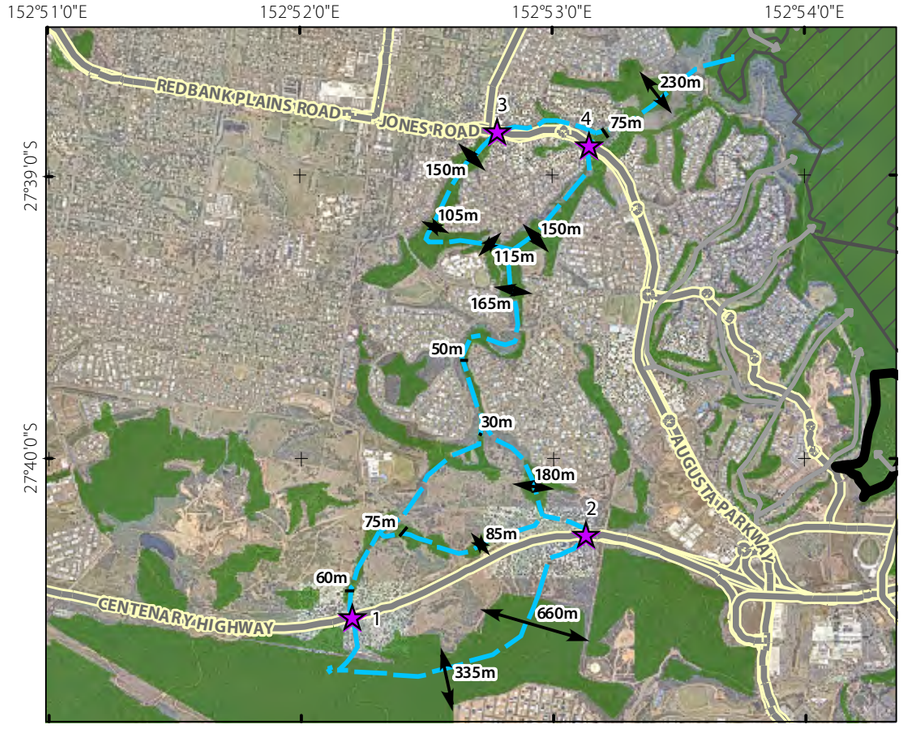
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Address: 163/SP291400

7399 E A01_2_2 SFA GG Corridors A

Issue	Date	Drawn	Checked
A	30/10/2025	TF	AW

1.05 Greater Glider Corridor Analysis (Corridor 3)



BARRIER ASSESSMENT

Photos are provided for the following locations:

1. Centenary Highway (-27.675969, 152.870346) – Located at Woogaroo Creek bridge crossing. Scattered Eucalyptus tereticornis in floodplain gully area north and south of bridge may provide opportunity for refuge, however, limited canopy trees up to edge of bridge is likely to limit access due to compromised glide trajectories.

2. Centenary Highway (-27.671154, 152.885345) –
Non-remnant vegetation comprising fragmented weed and native trees. Limited mature canopy trees on either side of road.

3. Augusta Parkway (-27.647414, 152.879836) –
Retained eucalypt vegetation on southern side of road bisected by road with nearest vegetation located >100 m to the north-east of Augusta Parkway.

4. Augusta Parkway (-27.648425, 152.886188) –
Woogaroo Creek bridge crossing dominated by relatively young regrowth vegetation to the north and south of bridge with juvenile Ficus sp. street trees along centre island. Mature scattered eucalypts further south and north.

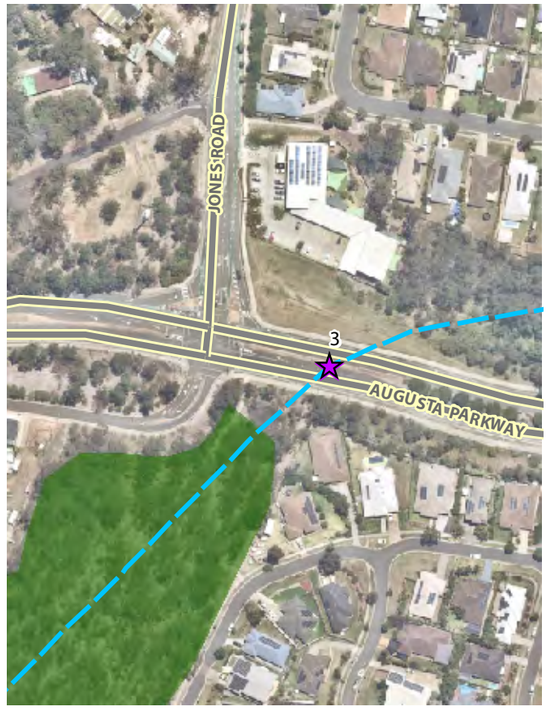
Assessment Location 1.



Assessment Location 2.



Assessment Location 3.



Assessment Location 4.



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Legend

- Referral Area
- Other EPBC Projects
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders
- Major roads

Corridors for Analysis

- Corridor 3
- Corridors 1-2 & 4
- Connectivity assessment location
- Connectivity barrier locations
- Greater Glider suitable Regional Ecosystems widths



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Peninsula Precinct

0 500 1,000 m

Transverse Mercator
GDA 2020 | Zone 56

1:40,000 @ A3

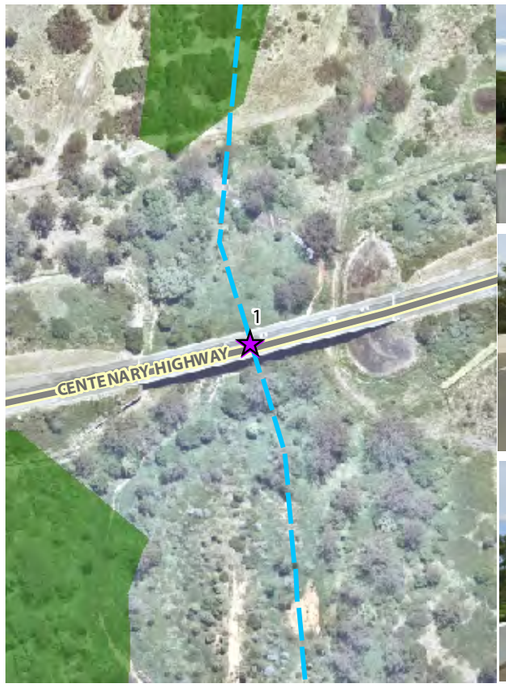
Address: 163/SP291400

7399 E A01_3_1 SFA GG Corridors A

Issue	Date	Drawn	Checked
A	30/10/2025	TF	AW

1.06 Greater Glider Corridor Analysis (Corridor 3)

Assessment Location 1.



Images 1-3. North, Southwest, East



Assessment Location 2.



Images 1-3. North, East, South



Assessment Location 3.



Images 1-3. Northeast, East, West



Assessment Location 4.



Images 1-3. North, Northwest, South



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Legend

- Referral Area
- Other EPBC Projects
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders
- Major roads

Corridors for Analysis

- Corridor 3
- Corridors 1-2 & 4
- Connectivity assessment location
- Connectivity barrier locations



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Peninsula Precinct

0 20 40 60 80 100 m

Transverse Mercator
GDA 2020 | Zone 56

1:3,000 @ A3

Address: 163/SP291400

7399 E A01_3_2 SFA GG Corridors A

Issue	Date	Drawn	Checked
A	30/10/2025	TF	AW

1.07 Greater Glider Corridor Analysis (Corridor 4)









Notes:
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Legend

- Referral Area
- Other EPBC Projects
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders
- Major roads

Corridors for Analysis

- Corridor 4
- Corridors 1-3
- Connectivity assessment location
- Connectivity barrier locations
- Greater Glider suitable Regional Ecosystems widths



BARRIER ASSESSMENT

Rural residential properties dominate the landscape to the north while to the east, west and south is highly developed with medium to low density residential communities and major infrastructure. Fragmented vegetation patches are interspersed with modified planted vegetation typical of rural residential properties providing limited value for greater gliders and compromising dispersal. Lower scale roads are a minor barrier, however, vegetation patches diminish in size and become progressively fragmented and ultimately remain unconnected to tracts of land with Greater Glider records.

Photos are provided for the following locations:

1. Meier Road, Camira (-27.636109, 152.911590) –
Fragmented rural residential properties located to the south-west and north-east of Meier Road with a mix of retained eucalypt trees and planted ornamental trees and shrubs.

2. Cairns Avenue and Hayes Road, Camira (-27.629625, 152.908448) –
Fragmented rural residential properties located to the south-west and north-east of Meier Road with a mix of retained eucalypt trees and planted ornamental trees and shrubs.

3. Jones Road, Bellbird Park (-27.635855, 152.884409) –
Thin strip of vegetation located south-west of Jones Road surrounded by cleared areas and residential communities.

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Peninsula Precinct

0 200 400 600 m

Transverse Mercator
GDA 2020 | Zone 56

1:20,000
@ A3

Address: 163/SP291400

7399 E A01_4_1 SFA GG Corridors A

Issue	Date	Drawn	Checked
A	30/10/2025	TF	AW

1.08 Greater Glider Corridor Analysis (Corridor 4)

Assessment Location 1.







Assessment Location 2.







Assessment Location 3.







Notes:
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Legend

- Referral Area
- Other EPBC Projects
- Greater Glider regional ecosystems with a known or possible association with Queensland greater gliders
- Major roads

Corridors for Analysis

- Corridors 1-3
- Corridor 4
- Connectivity assessment location
- Connectivity barrier locations



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SPRINGFIELD CITY GROUP

Peninsula Precinct

0 10 20 30 40 50 m

Transverse Mercator
GDA 2020 | Zone 56

1:2,000 @ A3

Address: 163/SP291400

7399 E A01_4_2 SFA GG Corridors A

Issue	Date	Drawn	Checked
A	30/10/2025	TF	AW

Attachment A7

Greater Springfield Fauna Spotter Catcher Analysis

1. Springfield EPBC Approval Areas



Notes:
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Legend

EPBC Approval Areas

Issue	Date	Description	Drawn	Checked
A	8/02/2023	Preliminary	TC	LT

0 500 1,000 m

Transverse Mercator | GDA 2020 | Zone 56 | 1:30,000 @ A3

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Springfield City Group

Address / RPD: Springfield, Qld

Springfield, Qld

8/02/2023 | Springfield E EPBC Approvals 01 A

Summary

SHG ID	EPBC	Project	Greater Glider (Y/N)	Collared Delma (Y/N)
7243	2013/7057	Spring Mountain	N	N
8473	2014/7306	Springview Village One	N	N
7927	2017/7875	Woogaroo	N	N
7399	2016/7676	First Nine	N	N
N/A	N/A	QUU Sewer Works	N	N

Spring Mountain

SHG ID	EPBC	Project	Stage/Phase	Duration (days)	Month/year	Greater Glider (Y/N	Collared Delma (Y/N)
7243	2013/7057	Spring Mountain		14	Oct-2016	N	N
				4	Nov-2016	N	N
				4	Nov-2016	N	N
				2	Nov-2016	N	N
				3	Dec-2016	N	N
				15	Feb-2017	N	N
				19	Mar-2017	N	N
			Village 8 & Services Corridor	6	Apr-2017	N	N
			Village 8 & 15	8	May-2017	N	N
			Village 11, 8 and 6-8 Crossing	7	Jul-2017	N	N
			Village 7 and Grande Avenue Wetlands	8	Aug-Sept 2017	N	N
			Village 8 (western Batter) & Mountain Creek S	2	Dec-2017	N	N
			Mountain Creek Sewer Alignment	2	Jan-2018	N	N
			Village 10 & 11	6	Feb-2018	N	N
			Town Centre Gully	10	Aug-2018	N	N
			Town Centre Gully & Crossing 5	5	Sep-2018	N	N
			Town Centre Gully	1	Oct-2018	N	N
			Village 17 access Track	1	Oct-2018	N	N
			Village 14	5	Oct-2018	N	N
			Village 8 & Local Park	2	Nov-2018	N	N
			Village 15	1	Nov-2018	N	N
			Town Centre Gully West, Stage 2	4	Apr-2019	N	N
			Village 15 Borrow Pit & Road 1501	5	May-2019	N	N
			Village 15	1	Jul-2019	N	N
			Village 17	4	Jul-2019	N	N
			Village 15	1	Aug-2019	N	N
			Village 16 Area B	4	Aug-2019	N	N
			Town Centre Gully West, Stage 3	2	Oct-2019	N	N
			Village 15 LOS	1	Oct-2020	N	N
			Village 14	2	Nov-2020	N	N
			Village 13 Sports Oval		Jul-2021	N	N

Spring Mountain

SHG ID	EPBC	Project	Stage/Phase	Duration (days)	Month/year	Greater Glider (Y/N)	Collared Delma (Y/N)
7243	2013/7057	Springfield Rise	Village 14 Ultimate Extent		Nov-22	N	N
			Village 17		Jun-22	N	N
			Village 16 Interim	10	Nov-24	N	N
			Village 16 Ultimate	68	Jan-March 2026	N	N

Kalina

SHG ID	EPBC	Project	Stage/Phase	Duration (days)	Month/year	Greater Glider (Y/N)	Collared Delma (Y/N)
8473	2014/7306	Springview Village One	Phase 1 early works	3	Jul-2018	N	N
			Phase 1 early works	2	Jul-2018	N	N
			Phase 2	9	Jul-2019	N	N

Woogaroo

SHG ID	EPBC	Project	Duration (days)	Month/year	Greater Glider (Y/N)	Collared Delma (Y/N)
7927	2017/7875	Woogaroo 2.6	22	Sept-Nov 2021	N	N
		Woogaroo 25m	15	Aug-22	N	N
		Woogaroo Ultimate	8	Oct-22	N	N

Brookwater

SHG ID	EPBC	Project	Stage/Phase	Duration (days)	Month/year	Greater Glider (Y/N)	Collared Delma (Y/N)
7399	2016/7676	First Nine	Springfield Town Centre North, Springfield Central & Brookwater	20	Mar-Apr-2018	N	N
			Springfield Town Centre North, Springfield Central & Brookwater	22	May-2018	N	N
			Springfield Town Centre North, Springfield Central & Brookwater	15	Jun-2018	N	N
			Springfield Town Centre North	1	Sep-2018	N	N
N/A	N/A	QUU Sewer	Sewer clearing works	19	Sep-2021	N	N

Attachment A8

Impact Area Raw Transect Data

Habitat Quality Site Assessment Template.....

PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD

For all environmental offset applications you must:

- Complete form (Environmental Offsets Delivery Form 1– Notice of Election and Advanced Offsets Details)
- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.
Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for: **An Impact Site** ☐ **An Offset Site** ☐ **an Advanced Offset Site** ☐

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Job Number	7399	Project Name	Peninsula Precinct

Part B - Site Data

Property		Date	23.01.2020

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1		12.9-10.2	Southeast Queensland

Site description and Location (including details of discrete polygons within the assessment unit)

Transect 1 - Corymbia citriodora, Eucalyptus crebra, Eucalyptus molucanna (dom)

Part C - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	6		
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved Ironbark
Scientific Name	*Eucalyptus molucanna*	Common Name	Gum-topped Box
Scientific Name	*Corymbia citriodora*	Common Name	Spotted Gum
Scientific Name	*Alphitonia excelsa*	Common Name	Soap Tree
Scientific Name	*Acacia leiocalyx*	Common Name	Early-flowering Black Wattle
Scientific Name	*Angophera leiocarpa*	Common Name	Smooth-barked Apple
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Shrub species richness:			
Total number of species	5		
Scientific Name	*Alphitonia excelsa*	Common Name	Soap Tree
Scientific Name	*Acacia fimbriata*	Common Name	Fringed Wattle
Scientific Name	*Acacia disparimma*	Common Name	Hickory Wattle
Scientific Name	*Acacia leiocalyx*	Common Name	Early-flowering Black Wattle
Scientific Name	*Jacksonia scopara*	Common Name	Dogwood
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	2		
Scientific Name	*Entolasia stricta*	Common Name	Wiry Panic
Scientific Name	*Cymbopogon refractus*	Common Name	Barbed Wire Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	6		
Scientific Name	*Lomandra confertifolia*	Common Name	Little Con Mat Rush
Scientific Name	*Eustrephus latifolius*	Common Name	Wombat Berry
Scientific Name	*Glycine sp*	Common Name	
Scientific Name	*Goodenia rotundifolia*	Common Name	Star Goodenia
Scientific Name	*Gahnia aspera*	Common Name	Rough Saw-sedge
Scientific Name	*Cyanthillium cinereum*	Common Name	Vernonia
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	2.00%		
Scientific Name	*Lantana camara*	Common Name	Lantana
Scientific Name	*Lantana montevidensis*	Common Name	Creeping Lantana
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters):	219.00		
1	1.40	26	
2	0.50	27	
3	20.00	28	
4		29	
5		30	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	0.00%	1.00%	5.00%	5.00%	1.00%	2.40%
Native other grass	15.00%	2.00%	3.00%	3.00%	0.00%	4.60%
Native forbs and other species	0.00%	0.00%	1.00%	1.00%	0.00%	0.40%
Native shrubs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Non-native grass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Non native forbs and shrubs	0.00%	0.00%	3.00%	3.00%	0.00%	1.20%
Litter	80.00%	97.00%	86.00%	86.00%	90.80%	87.96%
Rock	5.00%	0.00%	2.00%	2.00%	1.60%	2.12%
Bare Ground	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cryptogram	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Non- Eucalypt Large tree DBH benchmark used:	Eucalyptus crebra: 470, 390, 400 Eucalyptus molucanna 390
Number of large eucalypt trees:	250	Number of large non eucalypt trees:	0

Total Number Large Trees per ha:	4

Median Tree Canopy Height Measurements	Canopy:	20.00	Sub-canopy:	8.00	Emergent:	

Percentage of ecologically dominant layer species regenerating:	100

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	64.00	Sub-canopy:	33.40	Emergent:	
Shrub canopy cover %	2.90					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1	2.50	4.50	2.00	T2	3.30	6.40	3.10
T1	5.20	9.40	4.20	T2	12.10	12.30	0.20
T1	10.70	21.80	11.10	T2	12.90	13.00	0.10
T1	22.10	22.40	0.30	T2	13.30	13.70	0.40
T1	24.00	26.30	2.30	T2	15.90	16.30	0.40
T1	27.70	28.40	0.70	T2	16.30	17.60	1.30
T1	28.80	29.10	0.30	T2	19.30	22.60	3.30
T1	31.50	33.60	2.10	T2	23.40	26.30	2.90
T1	33.90	34.30	0.40	T2	26.60	28.90	2.30
T1	38.00	47.10	9.10	T2	29.10	31.20	2.10
T1	50.70	58.70	8.00	T2	31.70	33.40	1.70
T1	63.60	64.40	0.80	T2	34.50	37.20	2.70
T1	64.20	71.20	7.00	T2	37.70	39.20	1.50
T1	73.80	76.60	2.80	T2	42.60	42.80	0.20
T1	79.50	85.20	5.70	T2	55.30	55.60	0.30
T1	92.80	100.00	7.20	T2	55.70	56.90	1.20
				T2	60.80	61.30	0.50
				T2	62.10	64.40	2.30
				T2	76.60	78.00	1.40
				T2	78.30	78.70	0.40
				T2	81.80	86.90	5.10

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub	9.50	9.70	0.20	Shrub	44.70	44.80	0.10
Shrub	12.80	12.90	0.10	Shrub	75.20	75.30	0.10
Shrub	16.60	16.80	0.20	Shrub	75.50	75.60	0.10
Shrub	20.10	20.20	0.10	Shrub	75.90	76.10	0.20
Shrub	23.50	24.00	0.50	Shrub	76.90	77.00	0.10
Shrub	26.20	26.50	0.30	Shrub	85.20	85.40	0.20
Shrub	28.90	29.00	0.10	Shrub			
Shrub	36.90	37.50	0.60	Shrub			

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Corymbia citriodora	39
Eucalyptus tereticornis	8
Angophora leiocarpa	8
Acacia leiocalyx	19
Alphitonia excelsa	10
Eucalyptus moluccana	26
All species	110

Part J: SAT Survey Results

SAT Survey ID				
Tree Number	Scientific Name	Common Name	DBH	Scat (Y/N)
1	*Corymbia citriodora*	Spotted Gum	120	N
2	*Corymbia citriodora*	Spotted Gum	160	N
3	*Corymbia citriodora*	Spotted Gum	180	N
4	*Corymbia citriodora*	Spotted Gum	160	N
5	*Corymbia citriodora*	Spotted Gum	120	N
6	*Eucalyptus moluccana*	Gum-topped Box	100	N
7	*Corymbia citriodora*	Spotted Gum	100	N
8	*Corymbia citriodora*	Spotted Gum	160	N
9	*Eucalyptus moluccana*	Gum-topped Box	250	N
10	*Eucalyptus moluccana*	Gum-topped Box	100	N
11	*Corymbia citriodora*	Spotted Gum	160	N
12	*Corymbia citriodora*	Spotted Gum	180	N
13	*Corymbia citriodora*	Spotted Gum	200	N
14	*Eucalyptus moluccana*	Gum-topped Box	120	N
15	*Eucalyptus moluccana*	Gum-topped Box	120	N
16	*Corymbia citriodora*	Spotted Gum	120	N
17	*Corymbia citriodora*	Spotted Gum	100	N
18	*Corymbia citriodora*	Spotted Gum	190	N
19	*Corymbia citriodora*	Spotted Gum	210	N
20	*Corymbia citriodora*	Spotted Gum	150	N
21	*Corymbia citriodora*	Spotted Gum	130	N
22	*Corymbia citriodora*	Spotted Gum	210	N
23	*Corymbia citriodora*	Spotted Gum	140	N
24	*Corymbia citriodora*	Spotted Gum	140	N
25	*Eucalyptus moluccana*	Gum-topped Box	250	N
26	*Corymbia citriodora*	Spotted Gum	160	N
27	*Corymbia citriodora*	Spotted Gum	140	N
28	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	130	N
29	*Eucalyptus moluccana*	Gum-topped Box	370	N
30	*Eucalyptus moluccana*	Gum-topped Box	300	N
Total				0

Habitat Quality Site Assessment Template.....

PLEASE NOTE - YELLOW INDICATES AN AUTO POPULATED FIELD

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- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.
Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for: **An Impact Site** ☐ **An Offset Site** ☐ **an Advanced Offset Site** ☐

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Job Number	7399	Project Name	Peninsula Precinct

Part B - Site Data

Property		Date	23.01.2020

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1		12.9-10.2	Southeast Queensland

Site description and Location (including details of discrete polygons within the assessment unit)

Transect 3 - Corymbia citriodora (dom), Eucalyptus crebra, Eucalyptutereticornis, Corymbia intermedia. Eucalyptus molucanna

Part C - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	8		
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved Ironbark
Scientific Name	*Eucalyptus molucanna*	Common Name	Gum-topped Box
Scientific Name	*Corymbia citriodora*	Common Name	Spotted Gum
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum
Scientific Name	*Corymbia intermedia*	Common Name	Pink Bloodwood
Scientific Name	*Lophostemon sauveolans*	Common Name	Swamp Box
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash
Scientific Name	*Eucalyptus fibrosa*	Common Name	Red Ironbark
Scientific Name		Common Name	
Scientific Name		Common Name	

Shrub species richness:			
Total number of species	7		
Scientific Name	*Alphitonia excelsa*	Common Name	Soap Tree
Scientific Name	*Acacia fimbriata*	Common Name	Fringed Wattle
Scientific Name	*Acacia disparimma*	Common Name	Hickory Wattle
Scientific Name	*Acacia leiocalyx*	Common Name	Early-flowering Black Wattle
Scientific Name	*Lophostemon sauveolans*	Common Name	Swamp Box
Scientific Name	*Acacia consurrens*	Common Name	Black Wattle
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	2		
Scientific Name	*Themeda triandra*	Common Name	Kangaroo Grass
Scientific Name	*Cymbopogon refractus*	Common Name	Barbed Wire Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	2		
Scientific Name	*Lomandra confertifolia*	Common Name	Little Con Mat Rush
Scientific Name	*Dianella caerulea*	Common Name	Blue Flax Lily
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	2.00%		
Scientific Name	*Lantana camara*	Common Name	Lantana
Scientific Name	*Lantana montevidensis*	Common Name	Creeping Lantana
Scientific Name	*Passiflora suberosa*	Common Name	Corky Passion Flower
Scientific Name	*Pinus elliotii*	Common Name	Slash Pine
Scientific Name	*Lobelia purpurescens*	Common Name	White Root
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters):	95.00		
1	1.10	26	
2	1.40	27	
3	0.50	28	
4	2.00	29	
5	0.60	30	
6	0.50	31	
7	1.60	32	
8	0.50	33	
9	0.50	34	
10	0.80	35	
11		36	
12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	

25		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	0.00%	1.00%	1.00%	1.00%	5.00%	1.60%
Native other grass	3.00%	0.00%	2.00%	1.00%	1.00%	1.40%
Native forbs and other species	0.00%	2.00%	1.00%	1.00%	0.00%	0.80%
Native shrubs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Non-native grass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Non native forbs and shrubs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Litter	97.00%	97.00%	96.00%	95.00%	84.00%	93.80%
Rock	0.00%	0.00%	0.00%	2.00%	0.00%	0.40%
Bare Ground	0.00%	0.00%	0.00%	0.00%	15.00%	3.00%
Cryptogram	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Non- Eucalypt Large tree DBH benchmark used:	E crebra:380, 400, 380, 380 E. fibrosa 380, 410 E. molucanna 400
Number of large eucalypt trees:	250	Number of large non eucalypt trees:	7
Total Number Large Trees per ha:	8		

Median Tree Canopy Height Measurements	Canopy:	24.00	Sub-canopy:	12.00	Emergent:	

Percentage of ecologically dominant layer species regenerating:	50

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	46.20	Sub-canopy:	11.60	Emergent:	
Shrub canopy cover %	5.90					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1	0.00	4.90	4.90	T2	1.60	2.60	1.00
T1	6.40	13.50	7.10	T2	9.00	11.20	2.20
T1	16.00	19.00	3.00	T2	17.00	18.00	1.00
T1	22.00	27.50	5.50	T2	35.70	37.40	1.70
T1	29.40	32.70	3.30	T2	45.20	47.90	2.70
T1	42.00	43.50	1.50	T2	50.00	52.20	2.20
T1	45.20	50.00	4.80	T2	76.00	76.80	0.80
T1	54.00	57.50	3.50	T2			
T1	66.50	76.00	9.50	T2			
T1	79.70	82.80	3.10	T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
				T2			
				T2			
				T2			
				T2			
				T2			

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub	9.80	11.70	1.90	Shrub			
Shrub	48.80	49.80	1.00	Shrub			
Shrub	91.00	94.00	3.00	Shrub			
Shrub				Shrub			
Shrub				Shrub			
Shrub				Shrub			
Shrub				Shrub			
Shrub				Shrub			

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Eucalyptus fibrosa	2
Corymbia citriodora	27
Corymbia tesselaris	1
Eucalyptus crebra	6
Eucalyptus tereticornis	5
Eucalyptus molucanna	5
Acacia disparimma	5
Acacia concureens	1
Lophostemon sauveolans	4
Corymbia intermedia	1

Part J: SAT Survey Results

SAT Survey ID				
Tree Number	Scientific Name	Common Name	DBH	Scat (Y/N)
1	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	150	N
2	*Eucalytpus tereticornis*	Forest Red Gum	130	N
3	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	140	N
4	*Corymbia citriodora*	Spotted Gum	150	N
5	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	140	N
6	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	380	N
7	*Eucalytpus tereticornis*	Forest Red Gum	200	N
8	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	140	N
9	*Eucalytpus tereticornis*	Forest Red Gum	200	N
10	*Corymbia citriodora*	Spotted Gum	190	N
11	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	190	N
12	*Corymbia citriodora*	Spotted Gum	400	N
13	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	210	N
14	*Corymbia citriodora*	Spotted Gum	220	N
15	*Corymbia citriodora*	Spotted Gum	200	N
16	*Corymbia citriodora*	Spotted Gum	130	N
17	*Eucalytpus tereticornis*	Forest Red Gum	130	N
18	*Corymbia citriodora*	Spotted Gum	180	N
19	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	180	Y
20	*Corymbia citriodora*	Spotted Gum	120	Y
21	*Corymbia citriodora*	Spotted Gum	150	N
22	*Corymbia citriodora*	Spotted Gum	190	N
23	*Eucalytpus tereticornis*	Forest Red Gum	140	N
24	*Corymbia citriodora*	Spotted Gum	150	N
25	*Angophora leiocarpa*	Smooth-barked Apple	100	N
26	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	240	N
27	*Corymbia citriodora*	Spotted Gum	130	N
28	*Acacia disparrima*	Hickory Wattle	100	N
29	*Corymbia citriodora*	Spotted Gum	100	N
30	*Eucalytpus tereticornis*	Forest Red Gum	210	N
Total				2

Habitat Quality Site Assessment Template……..

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- Complete any other forms relevant to your application
- Provide the mandatory supporting information identified on the forms as being required to accompany your application

This form is useful for undertaking a **habitat quality analysis** of an impact and/or offset/advanced offset site.
Please note that this form should be completed individually for each assessment unit under consideration.

Is this Assessment for: **An Impact Site** ☐ **An Offset Site** ☐ **an Advanced Offset Site** ☐

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Job Number	7399	Project Name	Peninsula Precinct

Part B - Site Data

Property		Date	23.01.2020

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1		12.9-10.2	Southeast Queensland

Site description and Location (including details of discrete polygons within the assessment unit)

T5 - C citriodora with Eucalyptus crebra, Corymbia intermedia and Eucalyptus tereticornis

Part C - Native Species Richness: (*list species below)

Tree species richness:			
Total number of species	7		
Scientific Name	*Corymbia citriodora*	Common Name	Spotted Gum
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow-leaved Grey Ironbark
Scientific Name	*Coymbia intermedia*	Common Name	Pink Bloodwood
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum
Scientific Name	*Angophera leiocarpa*	Common Name	Smooth-barked Apple
Scientific Name	*Allocasuarina littoralis*	Common Name	Black She-oak
Scientific Name	*Lophostemon suaveolens*	Common Name	Swamp Box
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Shrub species richness:			
Total number of species	5		
Scientific Name	*Alphitonia excelsa*	Common Name	Soap Tree
Scientific Name	*Acacia leiocalyx*	Common Name	Early-flowering Black Wattle
Scientific Name	*Acacia disparimma*	Common Name	Hickory Wattle
Scientific Name	*Acacia concurrens*	Common Name	Black Wattle
Scientific Name	*Allocasuarina littoralis*	Common Name	Black She-oak
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	1		
Scientific Name	*Entolasia stricta*	Common Name	Wiry Panic
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	3		
Scientific Name	*Cheilanthes distans*	Common Name	Bristle Cloak Fern
Scientific Name	*Lomandra multiflora*	Common Name	Many-flowered Mat Rush
Scientific Name	*Lomandra longifolia*	Common Name	Mat Rush
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	5.00%		
Scientific Name	*Pinus elliotii*	Common Name	Slash Pine
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters):	112.00		
1	3.50	26	
2	0.50	27	
3	0.50	28	
4	3.50	29	
5	0.60	30	
6	0.50	31	
7	0.90	32	
8	1.20	33	
9		34	
10		35	
11		36	
12		37	
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14		39	
15		40	
16		41	
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19		44	
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24		49	

25		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	3.00%	0.00%	0.00%	1.00%	3.00%	1.40%
Native other grass	2.00%	1.00%	1.00%	1.00%	1.00%	1.20%
Native forbs and other species	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Native shrubs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Non-native grass	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Non native forbs and shrubs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Litter	95.00%	99.00%	99.00%	82.00%	94.00%	93.80%
Rock	0.00%	0.00%	0.00%	1.00%	0.00%	0.20%
Bare Ground	0.00%	0.00%	0.00%	15.00%	2.00%	3.40%
Cryptogram	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Non- Eucalypt Large tree DBH benchmark used:	250
Number of large eucalypt trees:	0	Number of large non eucalypt trees:	0
Total Number Large Trees per ha:	0		

Median Tree Canopy Height Measurements	Canopy:		Sub-canopy:	Emergent:	

Percentage of ecologically dominant layer species regenerating:	50

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	39.10	Sub-canopy:	27.40	Emergent:
Shrub canopy cover %	2.80				

Layer	Start	End	Interval	Layer	Start	End	Interval
T1	7.00	12.80	5.80	T2	0.00	6.70	6.70
T1	24.60	27.00	2.40	T2	21.60	23.60	2.00
T1	43.70	50.00	6.30	T2	26.00	35.00	9.00
T1	55.00	69.00	14.00	T2	38.70	39.70	1.00
T1	70.00	80.60	10.60	T2	81.00	83.00	2.00
T1				T2	88.30	95.00	6.70
T1				T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
T1				T2			
				T2			
				T2			
				T2			
				T2			
				T2			

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub	11.00	12.80	1.80	Shrub			
Shrub	16.00	17.00	1.00	Shrub			
Shrub				Shrub			
Shrub				Shrub			
Shrub				Shrub			
Shrub				Shrub			
Shrub				Shrub			
Shrub				Shrub			

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Corymbia citriodora	20
Eucalyptus crebra	3
Corymbia intermedia	6
Lophostemon sauveolans	1
Acacia disparimma	2
Acacia concurrens	3
Eucalyptus tereticornis	7
Alphitonia excelsa	3

Part J: SAT Survey Results

SAT Survey ID				
Tree Number	Scientific Name	Common Name	DBH	Scat (Y/N)
1	*Corymbia intermedia*	Pink Bloodwood	210	N
2	*Corymbia citriodora*	Spotted Gum	180	N
3	*Eucalyptus terteticornis*	Forest Red Gum	140	N
4	*Corymbia intermedia*	Pink Bloodwood	200	N
5	*Acacia disparrima*	Hickory Wattle	100	N
6	*Corymbia citriodora*	Spotted Gum	120	N
7	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	400	N
8	*Eucalyptus moluccana*	Gum-topped Box	150	N
9	*Corymbia intermedia*	Pink Bloodwood	200	N
10	*Corymbia citriodora*	Spotted Gum	160	N
11	*Corymbia intermedia*	Pink Bloodwood	220	N
12	*Eucalyptus terteticornis*	Forest Red Gum	210	N
13	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	400	N
14	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	280	N
15	*Eucalyptus moluccana*	Gum-topped Box	210	N
16	*Eucalyptus moluccana*	Gum-topped Box	400	N
17	*Eucalyptus terteticornis*	Forest Red Gum	130	N
18	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	220	N
19	*Corymbia intermedia*	Pink Bloodwood	150	N
20	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	280	N
21	*Corymbia citriodora*	Spotted Gum	250	N
22	*Corymbia citriodora*	Spotted Gum	340	N
23	*Corymbia citriodora*	Spotted Gum	160	N
24	*Corymbia intermedia*	Pink Bloodwood	200	N
25	*Eucalyptus terteticornis*	Forest Red Gum	220	N
26	*Eucalyptus terteticornis*	Forest Red Gum	130	N
27	*Eucalyptus terteticornis*	Forest Red Gum	230	N
28	*Eucalyptus crebra*	Narrow-leaved Grey Ironbark	260	N
29	*Eucalyptus terteticornis*	Forest Red Gum	140	N
30	*Eucalyptus terteticornis*	Forest Red Gum	150	N
Total				0

Attachment A9

Rosevale Offset Management Plan – ROA 3



ROSEVALE OFFSET MANAGEMENT PLAN

(EPBC2020/8629)

PENINSULA PRECINCT

29 SEPTEMBER 2026

[VERSION 2.5 - OMP]

Montauban Environmental Offsets

VERSION NUMBER AND DATE	PERSON RESPONSIBLE
VERSION 1.1 – OCTOBER 2021	CS & MG
VERSION 2.1 – JUNE 2022 (OMP COVERSION)	GT / CS
VERSION 2.2 – DECEMBER 2022 (OMP V2)	GT / CS
VERSION 2.3 – JANUARY 2024 (OMP V3)	NT / MS / AD
VERSION 2.4 – OCTOBER 2025 (OMP V4)	AW
VERSION 2.5 – SEPTEMBER 2026 (OMP V5)	AW

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ACRONYMS AND ABBREVIATIONS

ACR	Annual Compliance Report
AU	Assessment Unit
DCCEEW	Department of Climate Change, Energy and the environment and Water (Cth)
DEHP	Department of Heritage and Protection (Qld – former)
DES	Department of Environment and Science (Qld – former)
DETSI	Department of Environment, Tourism, Science and Innovation (Qld)
DILGP	Department of Infrastructure, Local Government and Planning (Qld)
DoEE	Department of Environment and Energy (Commonwealth – former)
DPI	Department of Primary Industries
DSDILGP	Department of State Development, Infrastructure, Local Government and Planning (Qld)
EDL	Ecologically Dominant Layer
EOP	EPBC Act Environmental Offset Policy (2012)
EPBC Act	Environmental Protection and Biodiversity Conservation Act 199
FHA	Foraging Habitat Assessment
GHFF	Grey-headed Flying-fox
ha	Hectare
KHA	Koala Habitat Area
km	Kilometres
LGA	Local Government Area
MEO	Montauban Environmental Offsets
m	Metre
mm	Millimetre
MSES	Matters of State Environmental Significance
NJKHT	Non-juvenile Koala Habitat Tree
OMP	Offset Management Plan
PA	Planning Act 2016 (Qld)
PR	Planning Regulation 2017 (Qld)
QFES	Queensland Fire and Emergency Services
RAI	Relative Abundance Index
RE	Regional Ecosystem
RMP	Rehabilitation Management Plan
ROA	Rosevale Offset Area
SARA	State Assessment Referral Agency (part of DILGP)
SAT	Spot Assessment Technique
SEQ	South East Queensland
SEQERF	Southeast Queensland Ecological Restoration Framework
SHG	Saunders Havill Group
SPP	State Planning Policy 2017 (Qld)
SRRC	Scenic Rim Regional Council
VDEC	Voluntary Declaration
VMA	*Vegetation Management Act 1999* (Qld)
WONS	Weeds of National Significance

DECLARATION OF ACCURACY

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

Signed _____

Full name (please print) _____

Organisation (please print) _Montauban Environmental Offsets_____

Date _____/_____/_____

491 Providing false or misleading information to authorised officer etc.

(1) A person is guilty of an offence if the person:

(a) provides information or a document to another person (the ***recipient***); and

(b) knows the recipient is:

(i) an authorised officer; or

(ii) the Minister; or

(iii) an employee or officer in the Department; or

(iv) a commissioner;

performing a duty or carrying out a function under this Act or the regulations; and

(c) knows the information or document is false or misleading in a material particular.

(2) The offence is punishable on conviction by imprisonment for a term not more than 1 year, a fine not more than 60 penalty units, or both.

Note: Subsection 4B(3) of the *Crimes Act 1914* lets a court fine a body corporate up to 5 times the maximum amount the court could fine a person under this subsection

1. INTRODUCTION

This document is the Offset Management Plan (OMP) for Montauban Environmental Offsets (MEO) Rosevale Offset Property and area specifically assigned to cater for impacts associated with the Springfield City Group's Scenic Precinct Project. The impact area is located at Brookwater Drive, Brookwater, Queensland 4300 within Lot 163 on SP303741. Springfield The offset area utilised for EPBC 2020/8629 is referred to as Rosevale Offset Area 3 (ROA 3).

The Rosevale Offset Property is located at Tarome Road, Tarome in South East Queensland and includes a combination of approved and proposed offset areas for Matters of National Environmental Significance. The Rosevale offset property is a wholly owned >800 ha land holding for which a number of EPBC biodiversity offsets are proposed in a broad aggregation of conservation outcomes. MEO propose to utilise most of the 800 ha property for MNES restoration offsets of which EPBC 2020/8629 will include 41.3 ha.

The OMP has been specifically prepared to respond to the Commonwealth Government's Department of Climate Change, Environment, Energy and Water (DCCEEW) comments in response to the draft Preliminary Documentation packages prepared for EPBC 2020/8629. This OMP has been generally prepared in accordance with the EPBC Act – *Environmental Offset Policy* (October 2012).

The ROA 3 has been selected and designed to compensate for at least 100% of impacts on habitat defined as critical for the Koala, Grey-headed Flying-fox (GHFF), Swift Parrot and Regent Honeyeater from resulting from the Scenic Precinct development. The offset proposal is a direct land-based solution which consists of establishment of new habitat and restoration of regrowth and remnant habitat.

It is noted a combined impact and offset assessment for Springfield City Group's EPBC 2020/8629 (Peninsula Precinct) and EPBC 2020/8651 (Scenic Precinct) and has been completed for the Swift Parrot and Regent Honeyeater. Planting obligations will be delivered across both the ROA 3 offset area (Peninsula Precinct) and adjoining ROA 4 offset area (Scenic Precinct). Both offsets will be delivered concurrently to achieve the proposed offset outcomes.

STRUCTURE OF THE OFFSET MANAGEMENT PLAN

Section 1: Introduction
Section 2: Overview of Proposed Offset Area
Section 3: Environmental Outcomes and Objectives
Section 4: Offset Site Suitability
Section 5: Baseline Surveys
Section 6: Offset Design Consideration and Amendments
Section 7: Rosevale Offset Area 4 Management Actions
Section 8: Adaptive Management Framework
Section 9: Risk Management
Section 10: Reference List
Section 11: Appendices

Appendices

Appendix A: MNES Habitat Quality Gain Tables
Appendix B: EPBC Offset Calculator Sheets
Appendix C: Suitably Qualified Field Ecologist – Curriculum Vitae
Appendix D: Habitat Quality Raw Data
Appendix E: Baseline Camera Monitoring – Raw Data
Appendix F: Rehabilitation Management Plan ROA 3

PURPOSE OF THE MANAGEMENT PLAN

The purpose of this OMP is to:

- Provide details and timing on the legally binding mechanism to secure the ROA 3 values at the Offset property;
- Provide baseline values for a range of key habitat quality indicators in the offset ROA 3 for repetitive use in measuring and monitoring habitat improvement commitments;
- Outline the specific management actions and tasks to be undertaken in the offset area for managing threats, pests and improving habitat values for the Koala, Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater;
- Outline restrictions and operational controls on existing agricultural and grazing land uses;
- Establish robust and scientifically driven metrics, monitoring and reporting procedures to ensure the offset delivery achieves the predicted conservation gain for the species;
- Assign responsibilities for tasks, actions, operational controls, measuring, reporting, corrective actions and funding for all works at the Rosevale offset property;
- Identify, account for and manage risks associated with all or part of the offset outcomes not succeeding through definition of an Adaptive Management Framework and corrective action triggers.

OFFSET MANAGEMENT PLAN LIMITATIONS

The OMP aligns with relevant principles and sections of the *Environmental Management Plan Guidelines* (2014), however, is designed for on-ground implementation and not specific value assessment against the EPBC Offset Assessment Guide (OAG). The assessment of values for Risk of Loss and Quality are included and justified within the technical information provided in the Preliminary Documentation prepared by Saunders Havill (2025). A summary of the EPBC Offset Assessment Guide is provided further into this OMP. Quality value changes in this assessment are derived from specific actions listed in this OMP and thus where applicable assessment metrics have been listed in the measurement targets of Management Action Tables included in Section 7.

RESPONSIBLE PARTIES FOR OFFSET MANAGEMENT PLAN

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

Springfield City Group Pty Ltd (Project Proponent)

Springfield City Group Pty Ltd are the owner and operational developer of the Scenic Precinct Project. Responsibilities include:

- Obtaining and complying with all conditions of the EPBC approval for the project.
- Entering into a commercial agreement with Montauban Environmental Offsets for the delivering of EPBC compliant offsets.
- Commissioning the preparation of Annual Compliance Reports as triggered within approved project conditions.

Montauban Environmental Offsets Pty Ltd (Offset Provider)

Montauban Environmental Offsets Pty Ltd (MEO) is a purpose-built environmental offset company. Responsibilities include:

- All on-ground implementation of the OMP.
- Monitoring and reporting on OMP actions, tasks and outcomes.
- Appointment of relevant experts or experienced contractors to undertake management actions within the ROA 3.
- Engaging suitably qualified person(s) to undertake monitoring surveys prescribed in the OMP and RMP.
- Undertaking corrective actions for any non-compliance activities and required adaptive management.
- Managing stakeholder relationships including adjoining grazing operations and Scenic Rim Regional Council.
- Commission a review and amendments to the approved OMP as required.

Saunders Havill (Environmental Consultant)

Saunders Havill Group provide the tertiary trained and experienced field ecologists in support of approval and ongoing compliance for the Rosevale offset property and Environmental Management Zones. Responsibilities to be carried out as appointed by the Proponent include:

- Collection, interrogation and analysis of robust scientifically justified survey data for use as the baseline values at the offset property.
- Repeating surveys as set out in this OMP or as per conditions of approval for measuring improvement outcomes.
- Preparation and lodgment of the Legally Binding Mechanism (VDEC) with the Queensland Government.
- Offset monitoring reports against reporting framework in this OMP and approval conditions.

LEGALLY BINDING MECHANISM

The Offset Area (as finalised through the EPBC Act Approval) will be legally secured through a Voluntary Declaration (VDEC) declared under the Queensland Government's *Vegetation Management Act 1999* (VMA). A VDEC protects land and values and is binding on future owners. The Queensland Government describes the benefits of the VDEC as "*One of the strengths of a declaration is that it provides greater protection to areas of land containing environmentally valuable native vegetation*."

The declaration and management plan will be noted on the land title, which informs prospective buyers of current declarations and management plans and where copies are available. This information is important to the property market as future owners will be bound by the plan and declaration (Queensland Government, 2017).

The legally securing of the land will be made through declaring the areas as having High Nature Conservation Values. Based on the VMA criteria the Offset Area will be declared as achieving items (d) and (f) below:

To be considered for declaration as an area of high nature conservation value, the area must be one or more of the following:

a) *a wildlife refugium—an area where a species or a group of species has retreated due to a threatening process (e.g. climatic change);*
b) *a centre of endemism—an area containing concentrations of species that are largely restricted to the area;*
c) *an area containing a vegetation clump or corridor that contributes to the maintenance of biodiversity;*
d) *an area that makes a significant contribution to the conservation of biodiversity;*
e) *an area that contributes to the conservation value of a wetland, lake or spring; or*
f) *another area that contributes to the conservation of the environment.*

The VDEC will be lodged and legally secured by evidence of encumbrance on Registered Land Title prior to the commencement of any clearing works on the Impact Site. As noted, this protects the vegetation by way of purpose-built regulation on the title so all future landowners are aware of the restrictions prior to purchase.

Following the VDEC, the offset area will be legally secured in perpetuity by a suitable mechanism agreed to by the department.

PROJECT DESCRIPTION – IMPACT SITE

DESCRIPTION OF THE ACTION

Springfield City Group Pty Ltd ('the Proponent') seeks to develop a mixed density residential community on land located at Brookwater Drive, Brookwater legally described as Lot 163 on SP303741. The proposed action

includes mixed-density residential dwellings, recreation and conservation, internal road network, and supporting infrastructure.

Contextually, the site is located within Springfield, Ipswich and lies within the Springfield Structure Plan (SSP) area. The SSP sets out the broader planning framework for land within the structure plan boundary. The Scenic Precinct will be developed in accordance with the SSP. The SSP designate the land as community residential and open space.

The site abuts Opossum Creek to the west and south, vacant land parcels to the north, Springfield Anglican College, residential areas and Springfield College Drive to the east. It is located approximately 1.5 km north of Springfield Central and 15.3 km south-east of Ipswich Town Centre. The site consists of remnant eucalypt woodland vegetation, mapped as Category B (remnant) under the Queensland *Vegetation Management Act 1999* (VMA). The surrounding landscape contains a matrix of mixed uses, including new residential developments, open space and future developments. The parcels to the north-east of the impact area described as Lot 50 on SP242316 and Lot 51 on SP242316 contains development area EPBC Referral 2020/8651 (Scenic Precinct).

The project design has been guided by physical constraints, *in situ* ecological values informed by specialist consultant reports and land use zoning. The majority of the site is zoned as Springfield Town Centre with an area of Springfield Open Space along the eastern boundary. As such, the site design is considered to be aligned with on-ground values and the planning intent of the area. The proposed park and open space area is located to provide a buffer to the adjoining Opossum Creek values adjoining the site to the north.

The proposed development footprint will necessitate the disturbance of approximately 18.9 hectares (ha) of vegetation. The proposed development will include a mixed precinct comprising:

- Town Business;
- Retail;
- Education; and
- Town Residential.

IMPACT AREA VALUES

The site contains 18.9ha of remnant vegetation mapped under the *Vegetation Management Act 1999* (VMA) which is mapped across the entirety of the site. The remnant vegetation is mapped as composite RE12.9-10.2/12.9-10.7/12.9-10.19 (65/20/15%) which are classed under the VMA as 'Least Concern', 'Of Concern' and 'Least Concern', respectively.

The dominant RE was identified to be 'Least Concern' RE12.9-10.2 due to the dominance of *Corymbia citriodora* (Spotted Gum) and *Eucalyptus crebra* (Narrow-leaved Ironbark) (Plan 1).

Elements of RE12.9-10.7 and RE12.9-10.19 are present as indicated by the presence of other canopy species including *Eucalyptus moluccana* (Gum-topped Box), *Eucalyptus fibrosa* (Broad-leaved Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus acmenoides* (White Mahogany) and *Angophora leiocarpa* (Smooth-barked Apple). The understorey contained a mix of *Acacia* species including *Acacia concurrens* (Black Wattle), *Acacia leiocalyx* (Early Flowering Black Wattle), *Acacia disparrima* (Hickory Wattle), *Acacia fimbriata* (Brisbane Wattle), and *Alphitonia excelsa* (Soap Tree). The ground layer was dominated by native forbs and grasses such as *Aristida vagans* (Threeawn Speargrass), *Themeda triandra* (Kangaroo Grass), *Cymbopogon refractus* (Barbed

Wire Grass), *Heteropogon contortus* (Black Speargrass), and contained an abundance of leaf litter. The ground layer was largely devoid of weeds except for isolated areas of *Lantana camara* (Lantana) and *Lantana montevidensis* (Creeping Lantana) infestations. The canopy height and coverage of the confirmed 'remnant' RE12.9-10.2 is consistent with the remnant status definition.

MNES IMPACT

The Controlled Action decision was based on the determination of potential impacts on the following Matters of National Environmental Significance (MNES):

Listed threatened species and ecological communities (sections 18 & 18A) protected under Part 3 of the EPBC Act, specifically:

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

Through detailed surveys and analysis two of these matters (Koala and Grey-headed Flying-fox) have been determined as likely to be impacted and triggering EPBC Act environmental offsets. An additional two (2) species have been determined to have critical habitat impacted as per Conservation Advice and also require environmental offsets:

- Swift Parrot (*Lathamus discolor*)
- Regent Honeyeater (*Anthochaera phrygia*)

The proposed action will result in the direct clearing and loss of 18.9 ha of habitat for the Koala and GHFF and the loss of 2,756 habitat features for the Swift Parrot and 3,339 habitat features for the Regent Honeyeater. Refer to Plan 1 for the proposed action impact plan and assessment units. Details on the impact on MNES are detailed in Table 1.

It is noted a combined impact and offset assessment for EPBC 2020/8629 (Peninsula Precinct) and EPBC 2020/8651 (Scenic Precinct) has been completed for the Swift Parrot and Regent Honeyeater as planting obligations will be delivered across both the ROA 3 offset area (Peninsula Precinct) and adjoining ROA 4 offset area (Scenic Precinct).

1. Impact Site Assessment Units



Montauban Environmental Offsets

1:4,100

0 50 100 m

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
© State of Queensland, 2022
© Nearmap, 2025

Project: Rosevale Offset Area 3

Date: 23/10/2025

10559 E 01 OMP_P Impact Site Assessment Units A

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Legend

- Qld DCDB
- Impact Site
- **AU 1**: Remnant RE 12.9-10.2 [18.90ha]

2. OVERVIEW OF PROPOSED OFFSET AREA

OFFSET AREA DESCRIPTION AND TENURE

The offset property (Rosevale) is located on Tarome Road, Tarome. The Rosevale offset property is and is approximately 9.5 km north-west of Aratula and located in the Scenic Rim Regional Council Local Government. The offset site associated with this property, Rosevale Offset Area 3 (ROA 3), is located approximately 51 km south-west of the Peninsula Precinct Project area, where MNES habitat impacts are proposed (**Plan 2**). The ROA 3 site was identified to achieve the offset required under the EPBC Act Preliminary Documentation.

Rosevale Offset Property is contained on the following allotments:

- Part of Lot 1/CC3571
- Lot 103/CH311061
- Lot 115/SP167206
- Lot 116/SP167206
- Lot 211/CH311636
- Lot 229/CH312601
- Lot 24/CH312265
- Lot 230/CH312495
- Lot 4/RP31137
- Lot 71/CH311061
- Lot 72/CH311061
- Lot 77/CH311086
- Lot 9/CH311910
- Lot 86/RP234513
- Lot 68/CH311061

For this offset strategy, the proposed offset area (ROA 3) is contained on the following allotment of the offset property:

- Part of Lot 1/CC3571

The land tenure of Rosevale is freehold, where it retains a rural land use zoning under the Scenic Rim Planning Scheme 2020. The offset property can be accessed via Moorang Lane off Tarome Road – both of which are rural roads. From the northern to the southern boundary the offset site spans 3.5 km and west to west covers 3.6 km. The offset site is currently zoned as Rural and is located adjacent to a core Biodiversity Corridor under the local government planning scheme, discussed in the following sections. The site context and site aerial of the offset site are provided in **Figure 1** and **Figure 2**, respectively. Key details relating to the offset site are in **Table 1**.

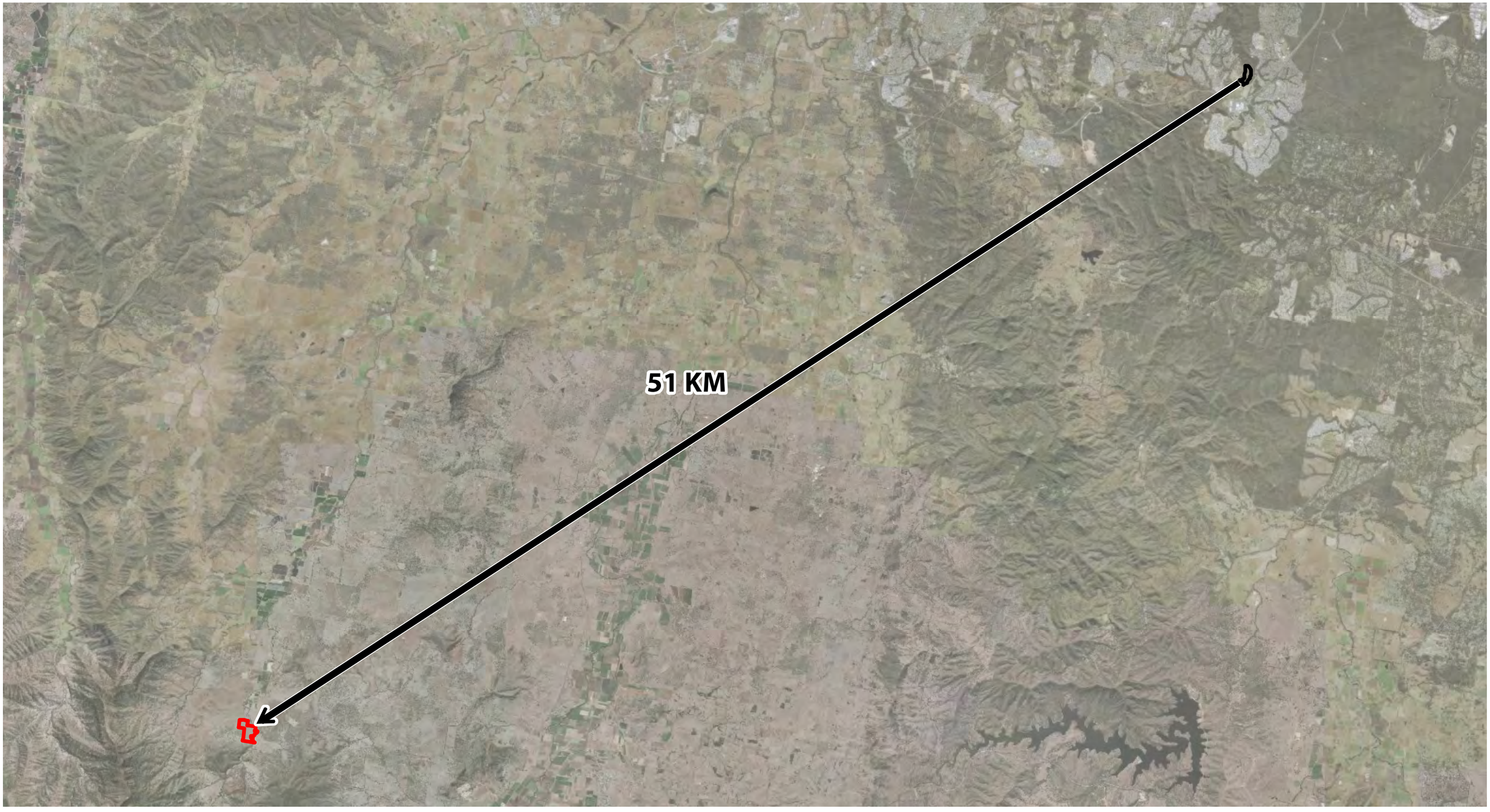
Table 1: Rosevale Offset Area 3 (ROA 3) Summary

Offset Site Address	1 Moorang Lane, Moorang, Queensland, 4340
Lot / Plan	Part of Lot 1 on CC3571
Area	41.3 ha of a 121.4 ha lot
Tenure	Freehold
Current Land Use	Cattle grazing and cropping
Local Government Area	Scenic Rim Regional Council

The Peninsula Precinct Offset Area forms part of the broader Rosevale Offset Property and is referred to throughout the OMP as the ROA 3 or Peninsula Precinct Offset area. The entirety of the Rosevale Offset Property totals to approximately 800 ha of the land, the majority of which is associated with a number of proposed EPBC biodiversity offsets with a broad aggregation of conservation outcomes. The ROA 3 area on-site associated with the Peninsula Precinct (EPBC 2020/8629) will account for 41.3 ha of the Rosevale Offset Property.

The Rosevale Offset Property comprises of mixed vegetation values, ranging from cleared open paddocks and dead plantation trees, through to regrowth and remnant open eucalypt forest. The ROA 3 site consists of entirely open paddocks and dead plantation trees, designated entirely as non-remnant which has been assessed throughout the report as two assessment units (AUs). The majority of ROA 3 is flat land with a constructed dam within the north-western portion of the area which contains a mapped drainage feature that connects to the Bremer River north-east of the site. Currently habitat values within ROA 3 are significantly limited with only scattered regrowth trees in the south adjoining mapped regrowth (Category C) vegetation and State mapped Koala Habitat Area.

2. Offset Property Context Plan



Montauban Environmental Offsets

1:160,000

0 1 2 4 km

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
© State of Queensland, 2022

Project: Rosevale Offset Area 3

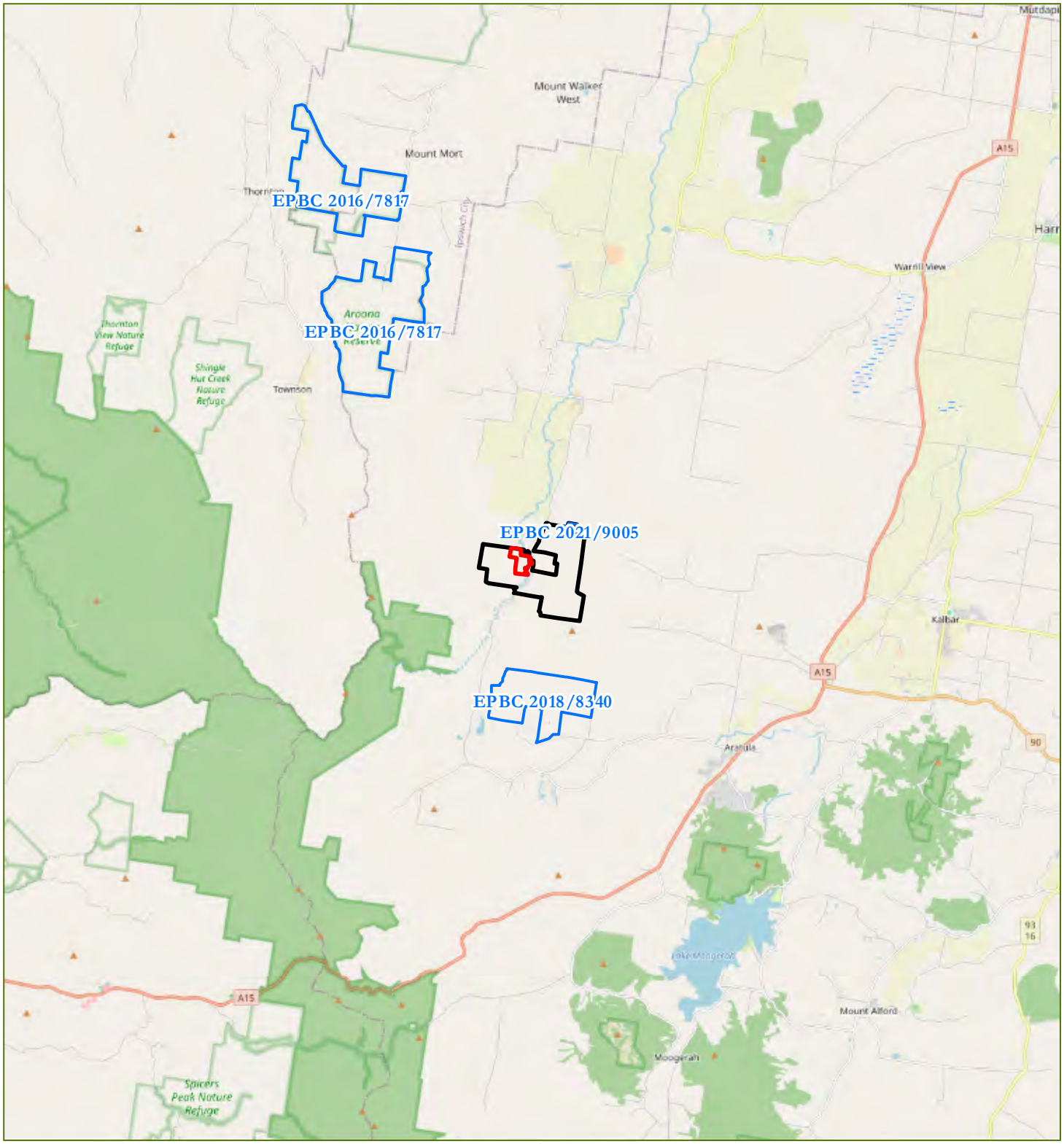
Date: 28/10/2025

10559 E 02 OMP_P Offset Property Context Plan A

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Legend

- Impact Site
- Offset Area



Legend

- Offset Properties
- Offset Area
- Existing Approved Offset

Figure 1

Offset Property Context

File ref. 10559 E Figure 1 OMP_P Site Context A
Date 23/10/2025
Project Rosevale Offset Area 3 - Peninsula Precinct

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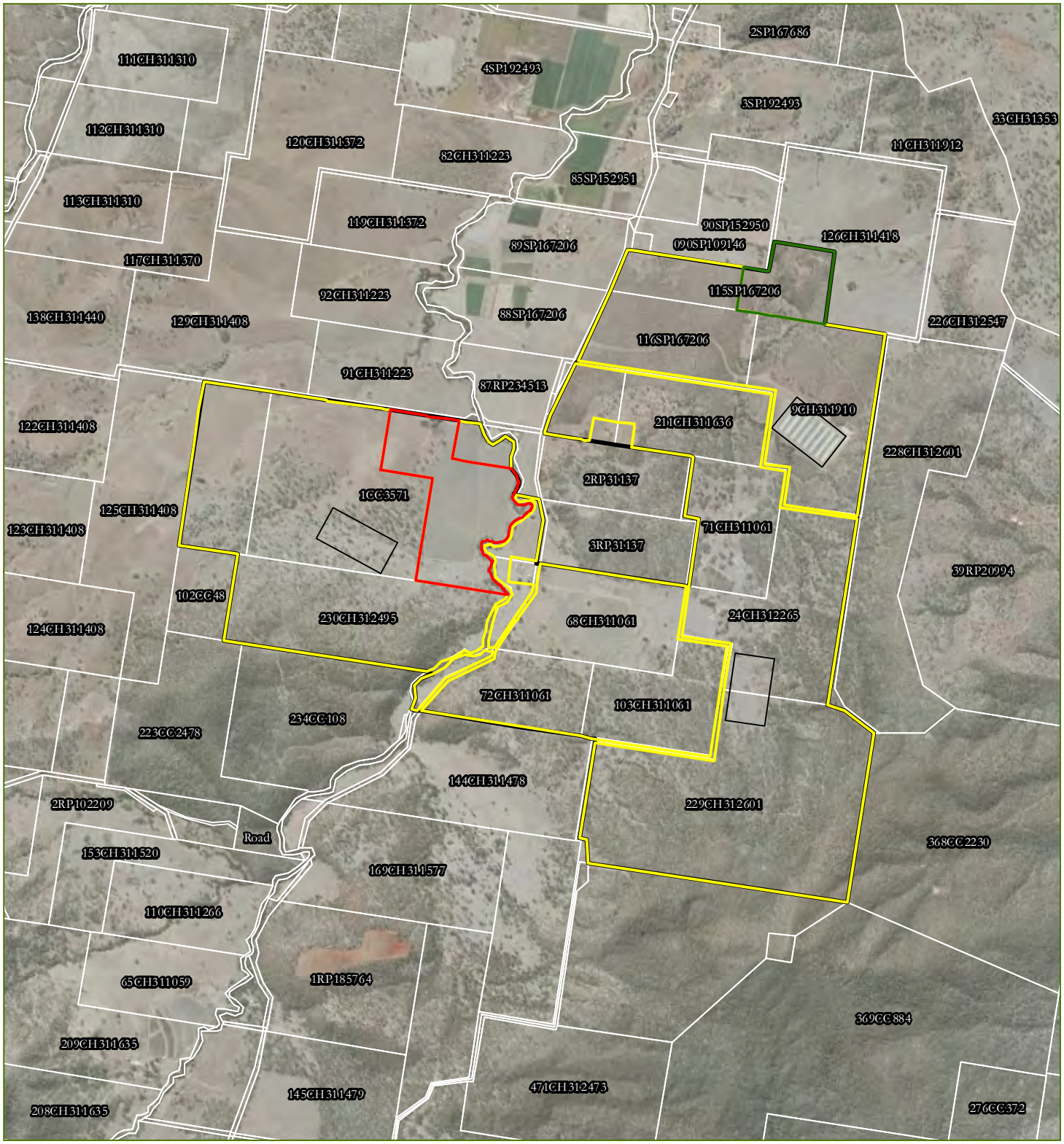
N

0 2 4 6 8 km

Scale (A4): 1:200,000 [GDA 2020 MGA Z56]

Montauban Environmental Offsets

Layer Source: © State of Queensland 2025



Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Poultry Shed
- Offset Properties

Figure 2

Offset Property Aerial

File ref. 10559 E Figure 2 OMP_P Site Aerial A
Date 23/10/2025
Project Rosevale Offset Area 3 - Peninsula Precinct

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0 200 400 600 800 1,000 m

Scale (A4): 1:30,000 [GDA 2020 MGA Z56]

Montauban Environmental Offsets

Layer Source: © State of Queensland 2025

OFFSET AREA VALUES

The offset property, Rosevale, comprises of mixed vegetation values, ranging from cleared open paddocks and dead plantation trees, through to regrowth and remnant open eucalypt forest. The offset area for this project, ROA 3, consists of mainly of open paddocks and regrowth vegetation.

TOPOGRAPHY

The Rosevale offset property is characterised by a high point located in the southern portion of the site (Lot 77/CH311086) which slopes to the north, where a low point is associated with a drainage feature which flows into the Bremer River to the north. The balance of the offset property is considered flat, with some undulating areas where there are cleared gully lines. The topography of ROA 3 is largely flat due to its location on the flats adjacent Bremer River.

WATER RESOURCE(S)

The Rosevale offset property contains numerous man-made farm dams which have been utilised for historic cropping and agricultural purposes. Natural water resources on-site are defined by the Bremer River which straddles the eastern boundary of the western parcels of the Rosevale offset property (Lot 230/CH312495 and Lot 1/CC3571). Additional to this major waterway, a network of mapped watercourses and drainage features as defined under the *Vegetation Management Act 1999* are observed throughout much of the Rosevale Offset Property. In regard to water resources in the ROA 3 offset, a mapped low-risk DPI waterway traverses through the centre of the lot which flows into the Bremer River to the north, a reservoir is present along the western boundary connecting to this drainage feature and two constructed dams are present at the northern extent. Refer to Plan 3 for identification of the water resources on the offset property.

The Rosevale offset property encompasses up to the low bank of the Bremer River with the low-bank un-allocated state land which is not within the proposed offset area. In its current state much of the Bremer River's vegetation is in a modified state due to cattle grazing activities. In the broader Rosevale Offset site holdings, offset management actions adjacent to the waterway will include weed management and rehabilitation plantings. Weed management adjacent to aquatic systems will be conducted by certified rehabilitation specialists with management to reduce run-off of chemicals and the use of aquatic safe herbicides advised. Additionally, research indicates that vegetation surrounding waterways benefits the aquatic system by reducing water temperature and helping filter out sediment and nutrients before it enters the waterway (Stephens, T. & Wright-Stow, A, 2017). The replenishment of native canopy and ground cover vegetation as well as the removal of grazing cattle and management of feral animals which exacerbate erosion such as Feral Pigs and Rusa Deer is anticipated to stabilise banks and ultimately improve water quality by limiting sediment run off into the aquatic system.

LANDSCAPE CONTEXT VALUES

The offset property is located approximately 9 km north-west of Aratula and adjoins a large tract of remnant vegetation associated with Mount Fraser to the south and Main Range National Park to the west. The offset property and restoration efforts will improve and promote east-west connectivity into the National Park,

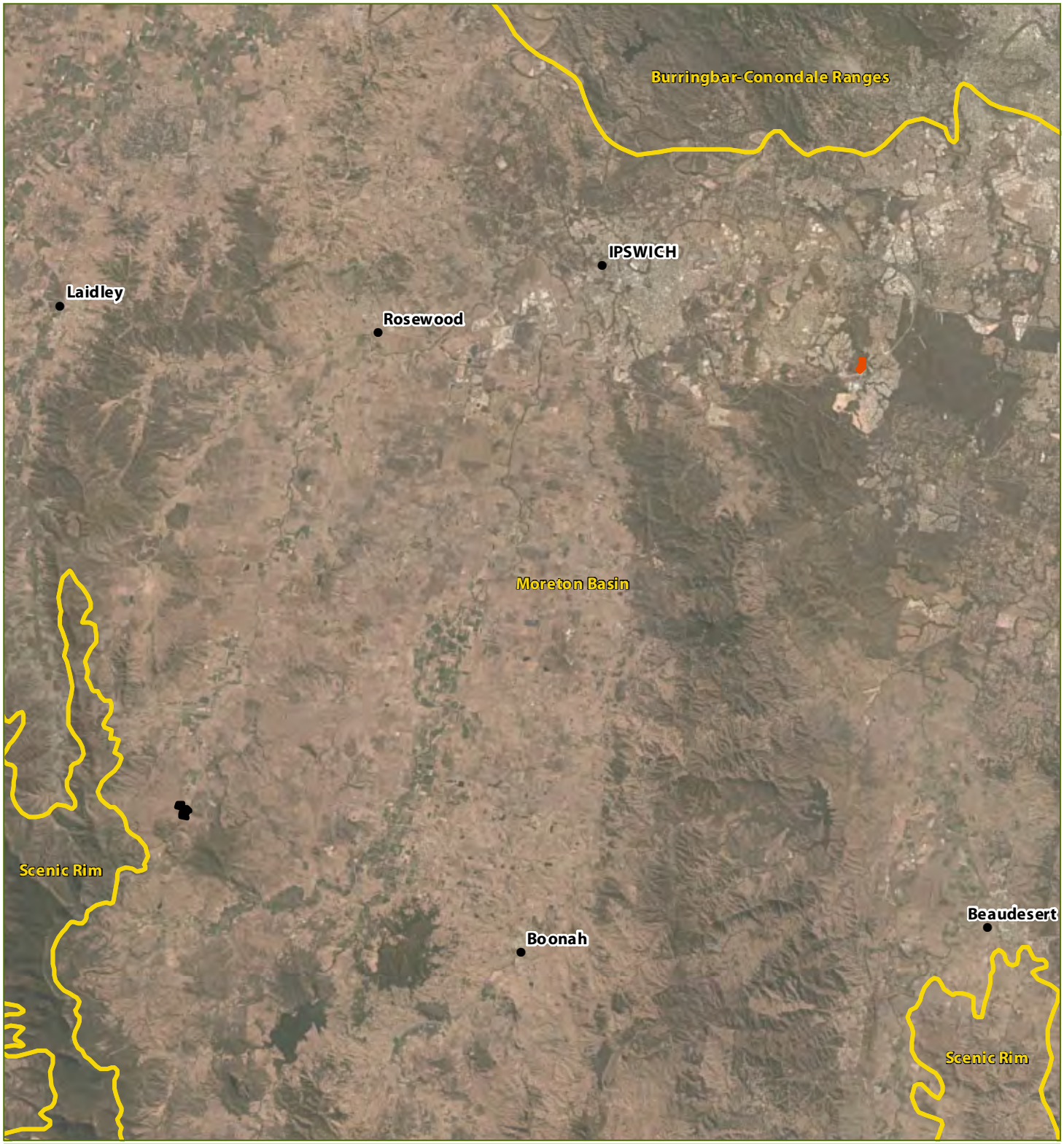
providing critical habitat refugia for native fauna. Presently, the offset property forms part of a greater than 10,000 ha contiguous landscape of native regrowth and remnant vegetation.

It is important that the offset area matches the environment of the impact area both from a vegetation perspective and landscape standpoint. For this reason, it is a benefit that both the impact and offset property occur within the same Interim Biogeographic Sub Region (SEQ 02 Moreton Basin Sub-region) as sought in draft Updated Offset Guideline material (Figure 3). The impact site and offset site are also located within the same Southeast Queensland bioregion (SEQ Bioregion 12) established and mapped by the Queensland Government. Furthermore, both the impact and offset properties are located within the same sub-region of Bioregion 12 mapped under the Southeast Queensland Biodiversity Planning documents (Figure 4) therefore experiencing similar climatic, landform, geological, topographical, vegetation and biota patterns. It is also noted that the impact and the offset property are located in adjacent Local Government Areas.

The ROA 3 is adjacent to land which contains a State Riparian Corridor that is associated with Bremer River (Figure 5) with essential habitat for Koala and State mapped Koala Habitat Areas mapped directly adjacent the southern and eastern boundaries. Therefore, enhancing the environmental values within the currently largely cleared offset area would improve the waterway corridor and increase safe movement opportunity and foraging habitat for Koala, GHFF, Swift Parrot and Regent Honeyeater.

The offset property also connects to vegetation that falls within the Regional Biodiversity Corridor 101 described as *Kangaroo Mountain to Rosewood Corridor: Extends from Kangaroo Mountain (Main Range National Park) through to Mt Walker and Rosewood Regional* (5 km) (Figure 6). Similarly, Moorang Wildlife Corridor, south of the offset site, forms a direct connection to the vegetation within the offset site. Therefore, all habitat protection and habitat creation is supported by this strategic intent of the land. It is also importantly noted that the land is not located within an area at threat of new development expansion, road or rail upgrades or extractive resource uses.

Review of publicly available data (Queensland WildNet & Atlas of Living Australia) indicate that there are numerous historical and recent Koala sightings surrounding the site (Plan 5). Atlas of Living Australia (2023) identifies 64 Koala sightings within 10 km of the offset area, 38 of which are from the past 13 years. This data indicates that the vegetation on and surrounding the offset property is suitable habitat for the Koala, and more importantly, the creation and enhancement of the east-west corridor connection to the Main Range National Park and improvement of the Bremer River corridor is an important outcome in achieving a positive conservation gain for the species and the genetic diversity of the Koala population in the Aratula and Scenic Rim locality.



Legend

- IBRA - Subregions
- Offset Properties
- Impact site

Figure 3

Interim Biographical Regionalisation of Australia - Moreton Basin Sub-Region

File ref. 10559 E Figure 3 OMP_P IBRA A
Date 23/10/2025
Project Rosevale Offset Area 3 - Peninsula Precinct

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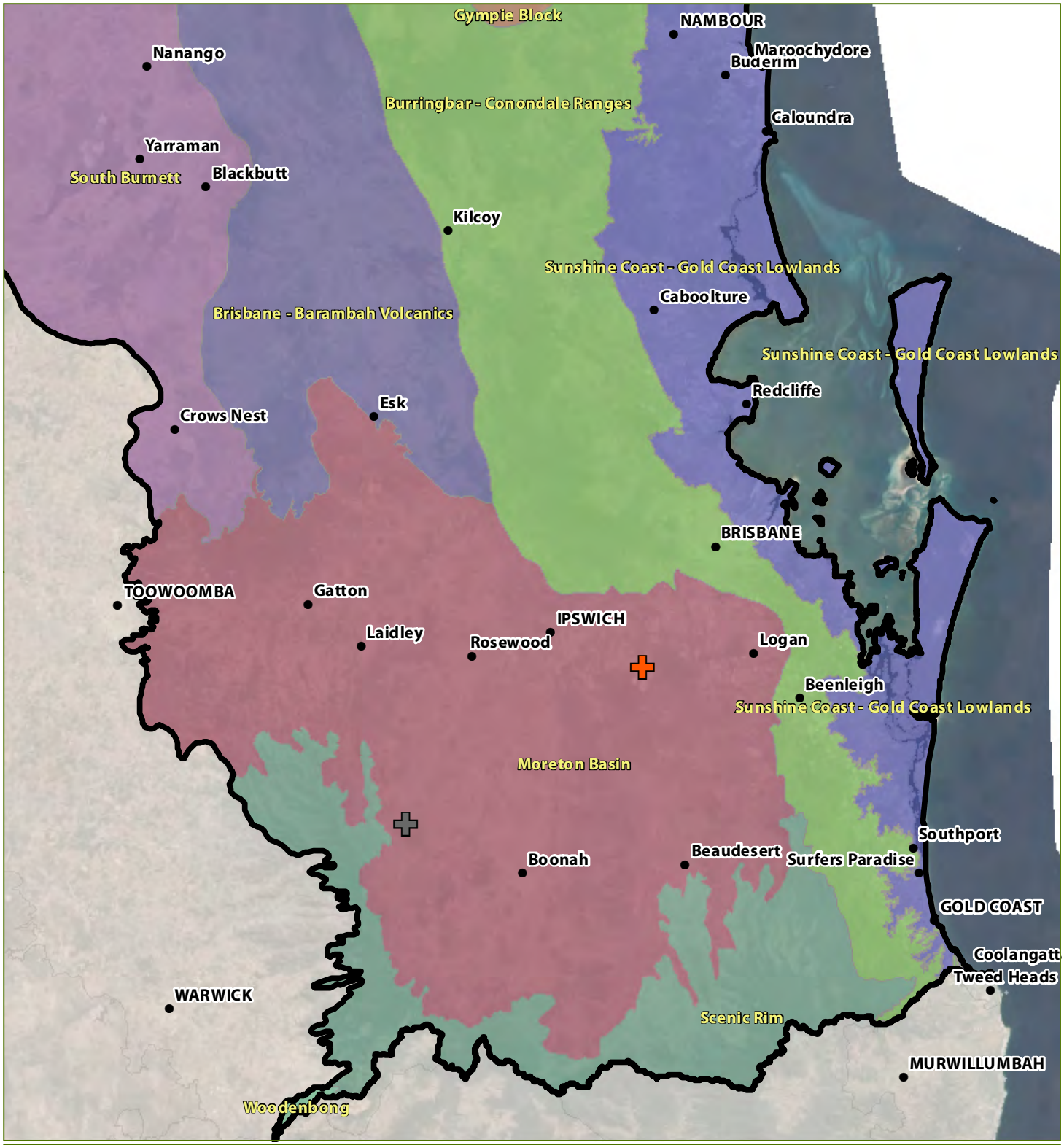
N

0 2 4 6 8 10 km

Scale (A4): 1:350,000 [GDA 2020 MGA Z56]

Montauban Environmental Offsets

Layer Source: © State of Queensland 2025



Legend

- South East Queensland Bioregion
- Offset Properties location
- Impact site location

Figure 4

South East Queensland - Bioregion 12 Biographical Subregions

File ref.	10559 E Figure 4 OMP_P Bioregion 12 A
Date	23/10/2025
Project	Rosevale Offset Area 3 - Peninsula Precinct

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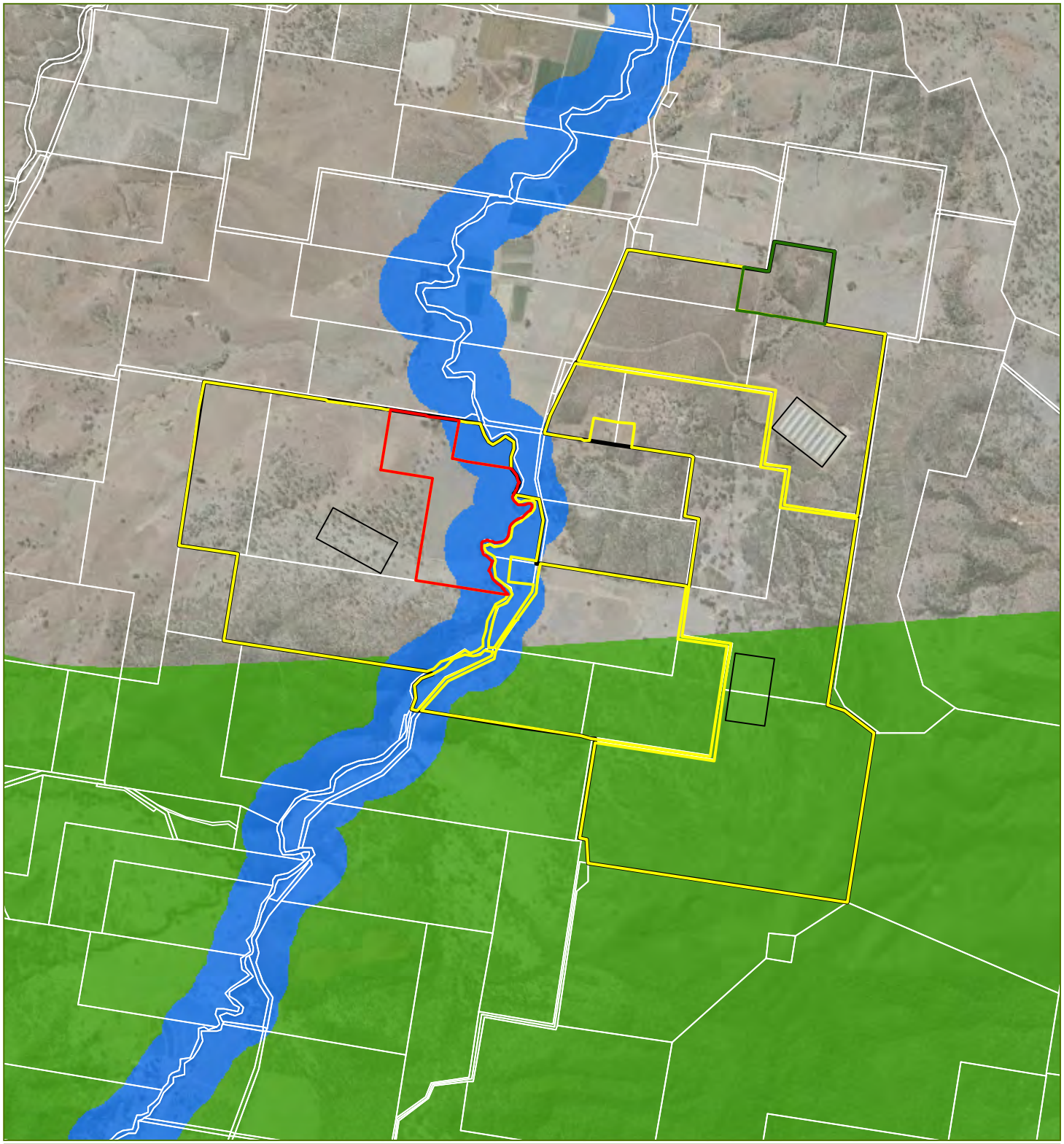
N

0 5 10 15 20 25 30 km

Scale (A4):1:1,000,000 [GDA 2020 MGA Z56]

Montauban Environmental Offsets

Layer Source: © State of Queensland 2025



Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Poultry Shed
- State Corridor Buffer
- Regional Corridor Buffer

Figure 5

South East Queensland Bioregional Planning Assessment - Corridor Mapping (Site Context)

File ref. 10559 E Figure 5 OMP_P BPA Site A
Date 23/10/2025
Project Rosevale Offset Area 3 - Peninsula Precinct

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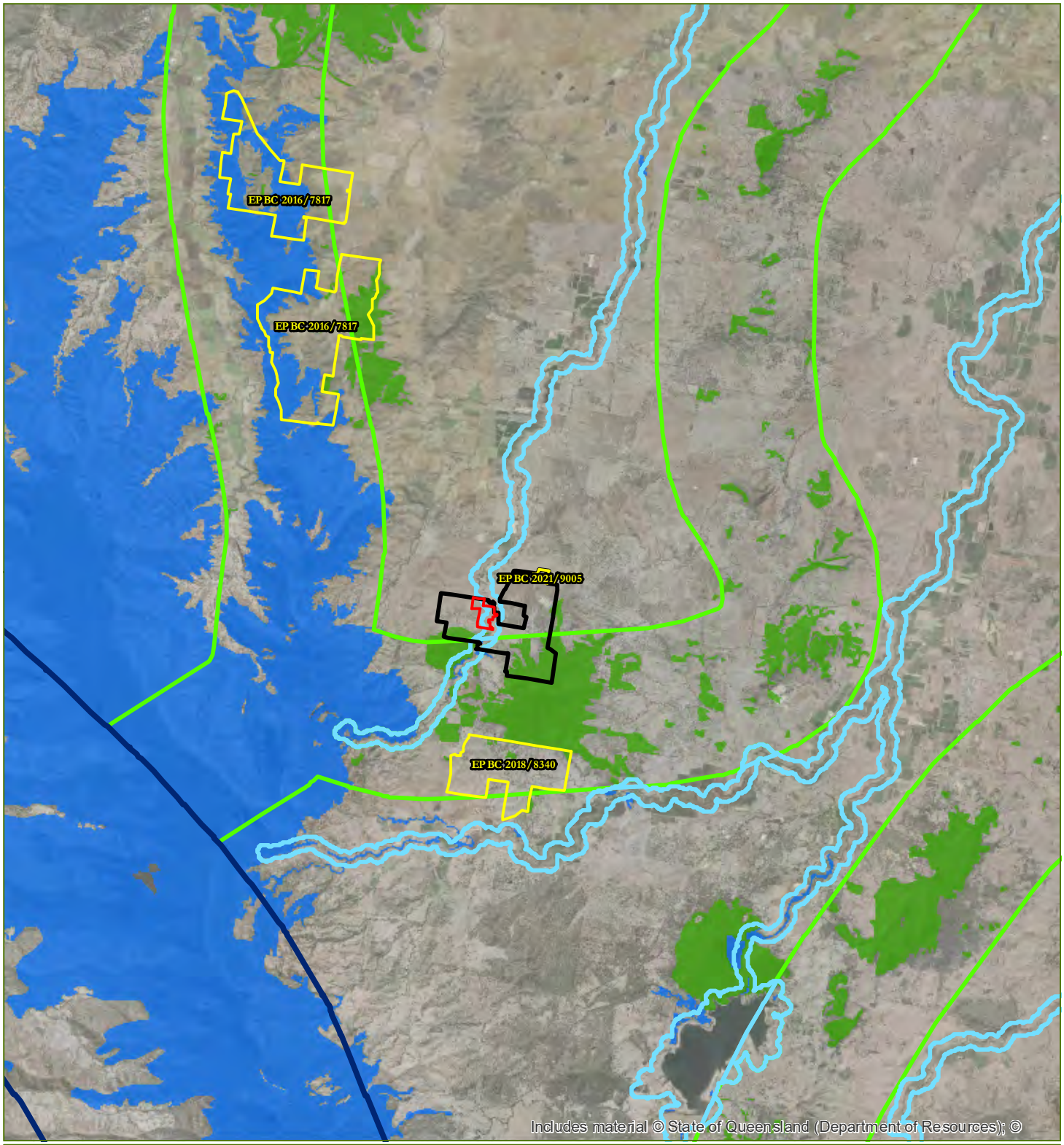
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0 200 400 600 800 1,000 m

Scale (A4): 1:30,000 [GDA 2020 MGA Z56]

Montauban Environmental Offsets

Layer Source: © State of Queensland 2025



Legend

- Offset Properties
- Offset Area
- Existing Approved Offset
- State Corridor (Terrestrial)
- State Corridor (Riparian)
- Regional Corridor (Terrestrial)
- State Vegetation
- Regional Vegetation

Figure 6

South East Queensland Bioregional Planning Assessment - Corridor Mapping

File ref. 10559 E Figure 6 OMP_P BPA Corridors A
Date 23/10/2025
Project Rosevale Offset Area 3 - Peninsula Precinct

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N

0 2 4 6 km

Scale (A4): 1:175,000 [GDA 2020 MGA Z56]

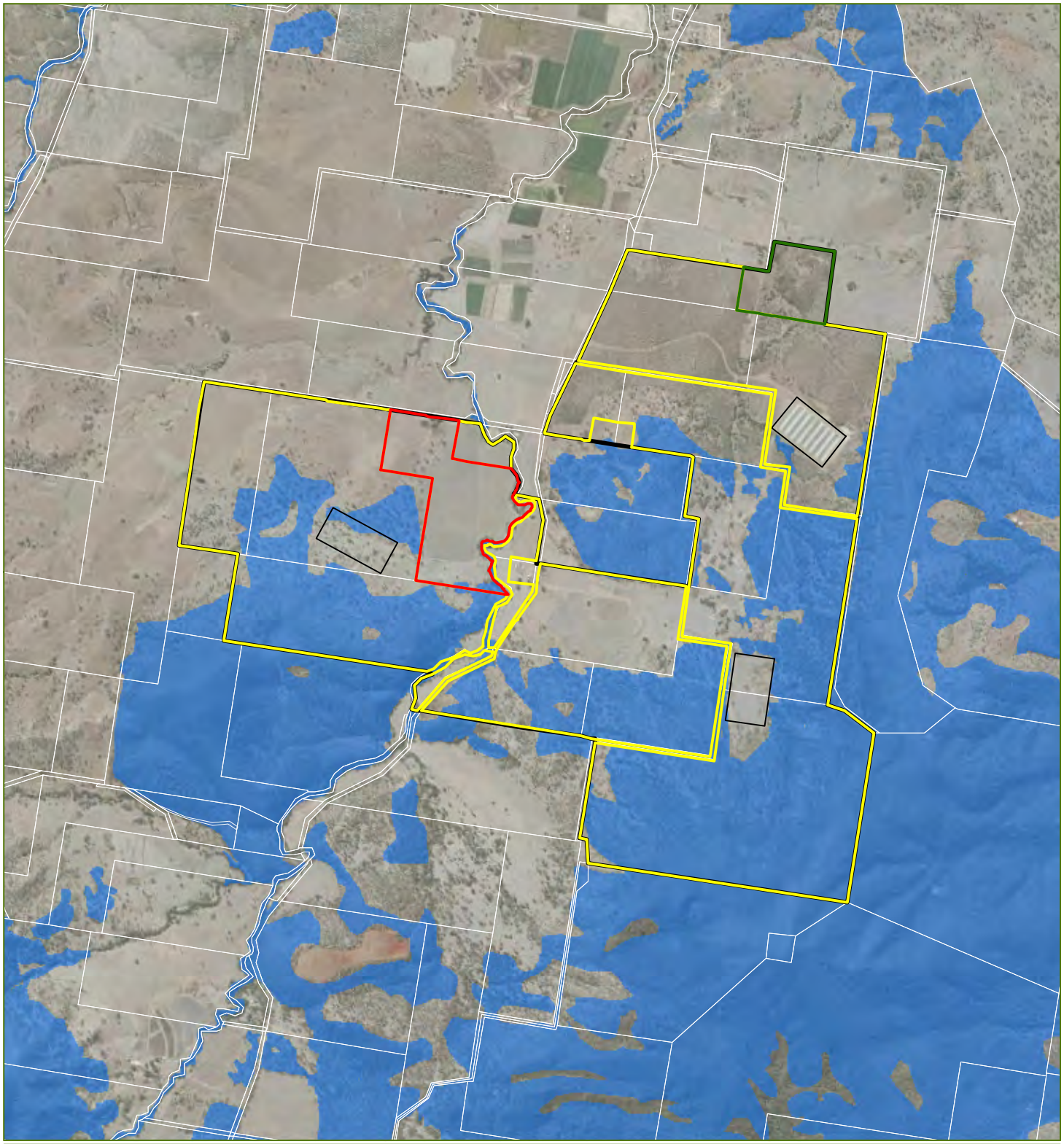
Montauban Environmental Offsets

Layer Source: © State of Queensland 2025

Surrounding state and local ecological value mapping to the offset site is considered significant to the conservation benefits it can provide. Locally the Rosevale offset property builds on a large cluster of vegetation mapped as 'Essential Habitat' for the Koala by the Queensland Government (Figure 7). The mapping of vegetated strands and fragments within the Rosevale offset property and surrounding the offset property strongly indicates that in providing protected and created habitat through this project it will ultimately also from part of the essential habitat network for the Koala. Where vegetation does occur on the offset property it is mapped as Core Koala Bushland under the Queensland Governments *South East Queensland Koala Conservation Strategy – 2020-2025* (Figure 8). The revegetation and management of ROA 3 will therefore benefit surrounding Koala habitat by reducing fragmentation and increasing safe fauna movement.

The unique characteristics of soil, land zone, topography, elevation and geographical region indicate that additional habitat creation through the offset works will also be mappable as Core Koala Bushland under the State within 12-15 years of planting. Under the Scenic Rim Regional Council's *Biodiversity Strategy -2015-2025* the offset property contains a mix of areas mapped as 'Core Nodes' and 'Landscape Linkage' areas. Therefore, further supporting that uplift of the surrounding unmapped areas will eventually add to the network of connected vegetation and formalise a fauna refuge in perpetuity. In solidifying this area for offset purposes and rehabilitating the area, the Rosevale offset property will help link key stepping-stone nodes, as identified by SRRC, to the very large Main Range and Border Range National Parks (Figure 9).

Similarly, Moorang Wildlife Corridor, south of the offset site, forms a direct connection to the vegetation within the Rosevale Offset Property. As of October 2022, Scenic Rim Regional Council committed to a 50 percent increase in funding for their Environmental Grants Program. This budget increase benefits community groups and landholders that are working towards enhancing the Scenic Rims natural environment, preserving habitat for rare and threatened species and improving the quality of Scenic Rim waterways. This is inclusive of landholders who are working to reduce/eliminate wild pigs spreading weed seeds and eroding riparian areas in the Moorang area. Additionally, in April 2023, SRRC also introduced a biannual baiting program for Wild Dog controls where large land holdings can more readily access bait to manage feral species. These programs are set up to work most effectively where neighbouring properties coordinate. Therefore, the enhancement of the Rosevale Offset Site via the Project and intended management action of wild dog and feral pig control coincides with SRRC Biodiversity Strategy and stops the vegetation on-site becoming a haven for feral animals.



Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Poultry Shed
- Offset Properties
- VMA Essential Habitat

Figure 7

Qld Vegetation Management Essential Habitat

File ref. 10559 E Figure 7 OMP_P EHAB A
Date 23/10/2025
Project Rosevale Offset Area 3 - Peninsula Precinct

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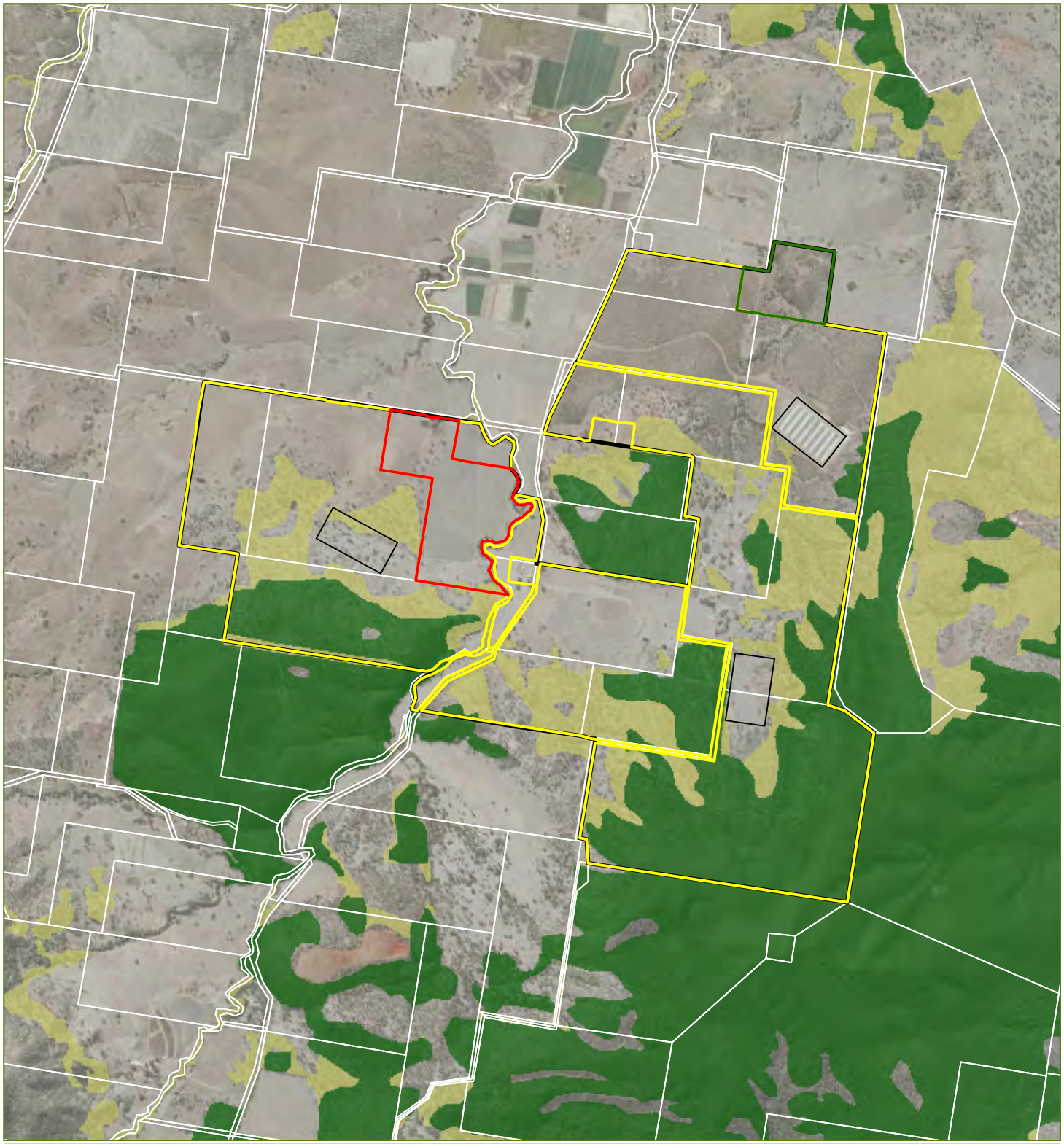
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0 200 400 600 800 1,000 m

Scale (A4): 1:30,000 [GDA 2020 MGA Z56]

Montauban Environmental Offsets

Layer Source: © State of Queensland 2025



Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Poultry Shed
- Offset Properties

Koala Habitat Areas

- Core Remnant Koala Habitat Areas
- Core Regrowth Koala Habitat Areas

Figure 8

Qld Koala Habitat Areas

File ref. 10559 E Figure 8 OMP_P Koala 2019 A
Date 23/10/2025
Project Rosevale Offset Area 3 - Peninsula Precinct

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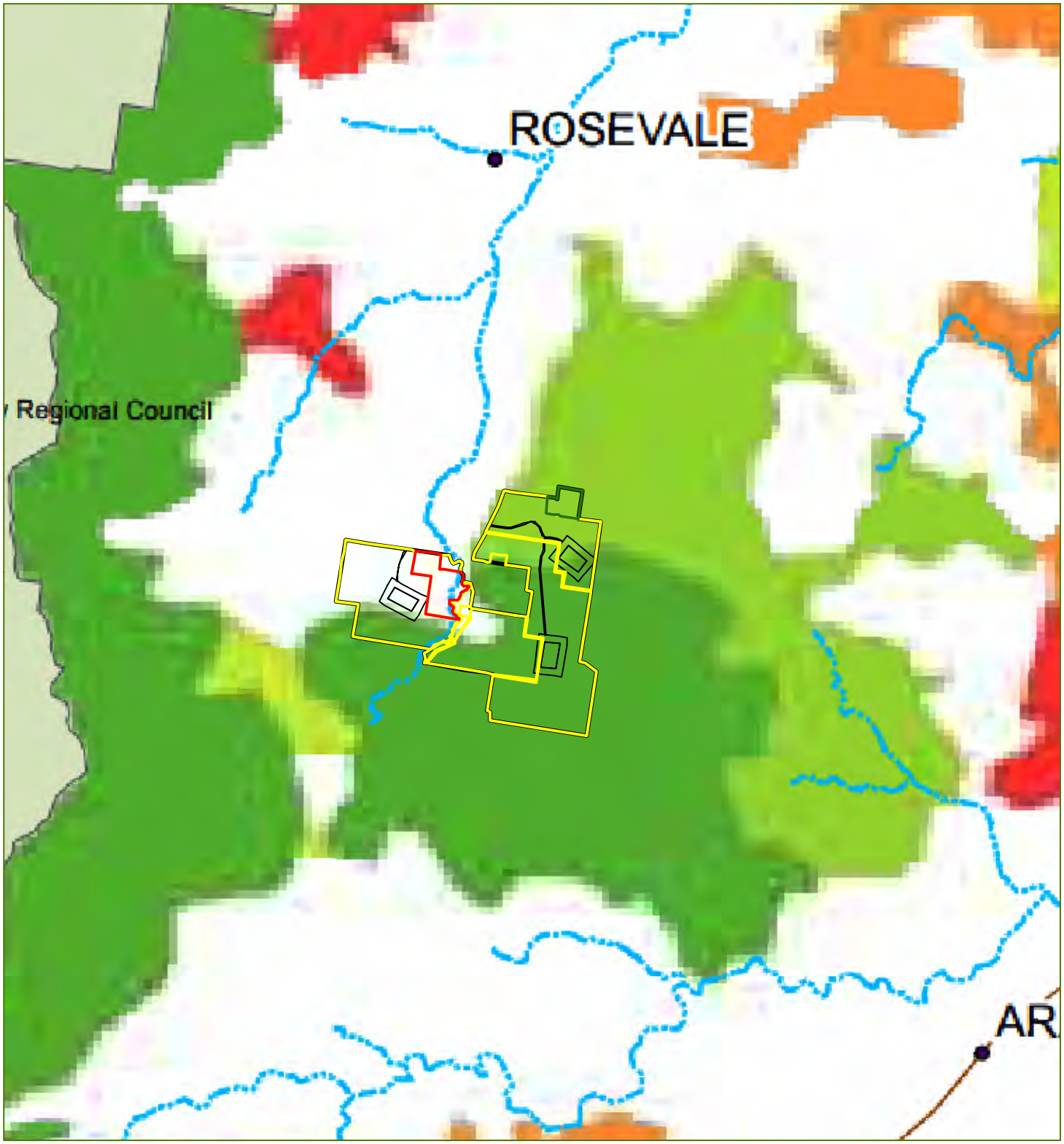
N

0 200 400 600 800 1,000 m

Scale (A4): 1:30,000 [GDA 2020 MGA Z56]

Montauban Environmental Offsets

Layer Source: © State of Queensland 2025



Legend

- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Poultry Shed, 100m buffer area & access tracks
- Offset Properties
- Core
- Core Node
- Grassy Woodland
- Woodland Node
- Stepping Stone

Figure 9

Scenic Rim Regional Council
Biodiversity Management Framework
for the Scenic Rim Region

File ref. 10559 E Figure 9 OMP_P Local Mapping A
Date 23/10/2025
Project Rosevale Offset Area 3 - Peninsula Precinct

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N

0 1 2 3 km

Scale (A4): 1:80,000 [GDA 2020 MGA Z56]

Montauban Environmental Offsets

Layer Source: © State of Queensland 2025

CURRENT MANAGEMENT ARRANGEMENTS

Presently, the Rosevale offset property is utilised for poultry farming, hardwood plantation, cattle grazing and cropping. A description of the current management arrangements is included below.

Refer to **Plan 4** for the location of the current management arrangements.

HARDWOOD PLANTATION

The offset property contains approximately 110 ha of land which has historically been utilised for hardwood plantation. The hardwood plantation consisted of native eucalypt species, which were planted in 2009, and then harvested and sold for commercial uses. The hardwood plantation management arrangement is a popular use in the surrounding area. The most recent hardwood plantation was impacted during a property maintenance burn which damaged the plantation stock, and it was unable to be harvested for commercial purposes. The financial incentive of hardwood plantation surrounding the poultry farming operations deems this a viable land management arrangement.

Refer to **Plan 4** or the hardwood plantation management area.

CATTLE GRAZING

The rural designation, undulating landscape and historically cleared open paddocks of the offset property provide for suitable cattle grazing practices. The offset property has cattle carrying capacity of approximately 300 head of cattle. The cattle grazing management arrangement compliments the poultry farming and hardwood plantation land uses, with no loss in cattle grazing capacity. The cattle grazing management practices occurs over the entirety of the Rosevale offset property.

CROPPING

The western offset property parcel (Lot 1 / CC3571) which is bound by the Bremer River on the eastern property boundary and offset property parcel Lot 77 / CH311086 contains suitable land type and topography to facilitate agricultural cropping. Given the accessibility to water (Bremer River) and compatibility for cropping uses, the flat land on Lot 1 / CC 3571 is suitable for an intensive management action, which compliments other compatible land uses on the offset property. The ability to undertake agricultural cropping on the offset property allows the landholder to provide feed for or fatten the cattle on-site. Cropping activities which overlap with the ROA 3 offset will be discontinued once approved and management activities begin.

Refer to **Plan 4** for the location of the cropping use on the offset property.

POULTRY FARMING

Presently, the Rosevale Offset Property retains existing poultry farming operations which have been occurring on the offset property since 2018. The poultry farming operations consist of 8 commercial broiler sheds with a capacity of approximately 360,00 birds and are 1.6 km north-east of the proposed ROA 3 offset. Furthermore, a Development Application has been approved for an additional 8 sheds (360,000 birds) which will be constructed in the next 2 years, one of which is planned south-east of ROA 3. For the existing poultry farm access roads are currently present and future proposed access is proposed to the approved poultry farms. These are considered a part of current management actions due to the increase of anthropogenic activity and vehicle

movement within these areas. This current management arrangement results in an intensive agricultural function on a large portion of land, which is retained and utilised for other compatible uses.

Under the Department of Agriculture and Fisheries *Development of Meat Chicken Farms in Queensland* (2016), "fixed setback distances" are established and maintained between the meat chicken farm and sensitive land uses. However, sensitive land uses referred to in this act are defined as community facilities, accommodation and dwellings, not environmental areas (Queensland Planning Provision, v4.0, 2014). This DAF document also indicates that these "are included largely to permit a simple, conservative evaluation of required buffer distances" and highlights the need for site-specific evaluation of setbacks in relation to sensitive land uses. Site-specific separation distances are heavily based on the dispersion of odours from their source. Regardless, a 100 m buffer area from the poultry farms to the offset site is provided to minimise the impacts of human activity, odour, dust, noise and light on intended offset areas conservation values.

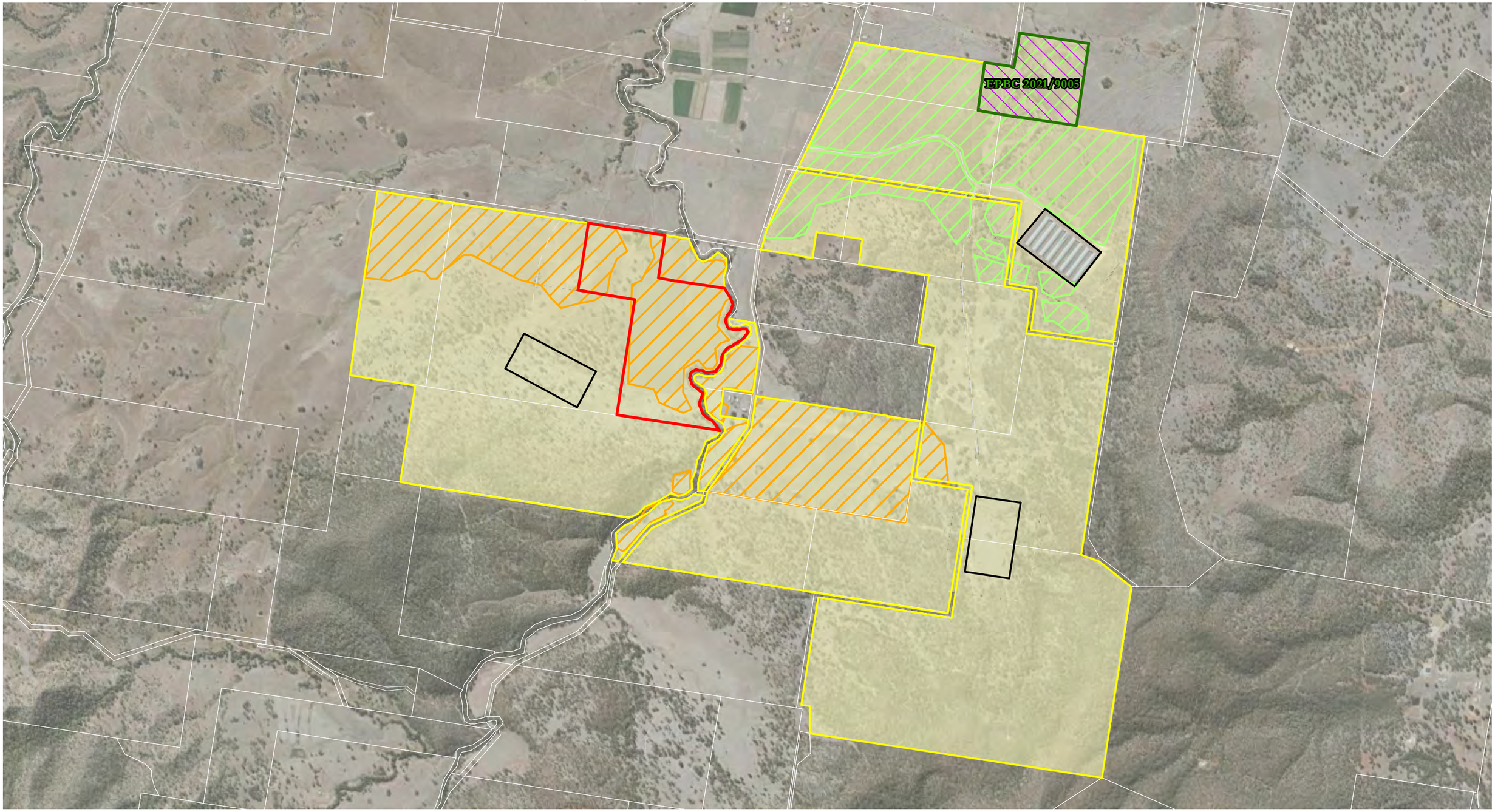
The current Rosevale Property Offset Property land holdings contain an existing operational poultry farm with 2 additional facilities approved and proposed over the area, none of which are within the boundaries of ROA 3. Refer to Plan 4 for the location of the poultry farming operations on the offset property. However, one of the new facilities is proposed approximately 300 m east of the offset area for the Scenic Project. Despite already approving environmental offsets for MNES (Koala) at the Rosevale Offset Property on the 2nd of November 2022 (EPBC 2021/9005) and an another offset for Koala, GHFF and Greater Glider in 2022, 2.6 km south of the Rosevale Offset property (EPBC 2018/8340), the Department has subsequently raised concerns around the potential incompatible dual use of the land holding for a poultry operation and environmental offsets.

No detailed commentary has been provided to support the specific incompatibility concerns, however, based on the information collected and considered in this OMP, no overt conflicts or impacts have been identified which out weight or impair the conservation gain opportunities the property provides. Currently the majority of the 41.3 ha ROA 3 contains very limited canopy coverage and therefore safe fauna movement is largely absent as Koalas are required to traverse large expanses of ground to move between foraging trees. With the implementation of the management actions in this Offset Management Plan, safe fauna movement would be reinstated across the area which limits the threats from wild dogs due to the provision of consistent foraging trees.

Importantly, it is noted that at no stage were offsets proposed over any areas with existing or proposed infrastructure supporting the poultry operation. The Rosevale Offset land holdings cover approximately 800 ha of land spread over 16 registered allotments. From the northern boundary to the southern boundary the land covers 3.5 km and measures 3.6 km east to west. The existing poultry farm infrastructure at the site including sheds, tanks, office, storage, access tracks, diversion swales and basins covers a maximum area of 8.75 ha or a little over 1% of the site. Allowing for the remaining facilities to be completed and including existing farmhouses, pump stations, cattle yards and sheds the total portion of the land utilised by infrastructure would be less than 27 ha or approximately 3.7% of the total land area. None of this land has been proposed for use within any approved or lodge offset proposal.

The balance of the land is currently used for cropping on the flat lightly undulating creek plain zones and cattle grazing throughout. Both of these uses will cease with approval and commencement of offset actions where they overlap with the proposed offset area.

4. Offset Property Current Management Activities



Montauban Environmental Offsets

N
W E
S

1:18,000

0 200 400 m

Co-ordinate System: GDA2020 MGA Zone 56

References:
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Project: Rosevale Offset Area 3

Date: 23/10/2025

10559 E 03 OMP_P Offset Property Current Management A

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Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Chicken sheds
- Poultry shed access track
- Cattle Grazing
- Pest and Weed Management Activities
- Historical Hardwood Plantation Area
- Historical Cropping Area

CURRENT THREATS

The offset property contains a variation in agricultural uses and land types from existing remnant vegetation through to open cropping land. Several flora and fauna species observed directly or indirectly (scats, prints, etc) within the Offset Property are listed under the *Biosecurity Act 2014*, Schedule 2 Part 2 as a restricted matter – invasive biosecurity matter as well as Scenic Rim Regional Council declared pest animals or weeds (Table 2). Several of the identified restricted species form the basis of management requirements due to their direct impact to MNES listed species or indirect impact to the habitat required to support these species.

The Scenic Rim Regional Council also lists Feral Goats (*Capra hircus*) and Fire Ants (*Solenopsis Invicta*) as declared pest animals, with neither of these identified as occurring on-site. Should their presence be detected in future surveys then they will be adopted into the pest management program, which is designed with adaptive management measures for flexibility. Fire Ants in particular have strict biosecurity measures required to stop their spread, with sightings needing to be immediately reported to Biosecurity Queensland.

Table 2: Offset property restricted invasive matters identified as threats to MNES.

Biosecurity Act 2014 Restricted Matter	Direct / Indirect Impact	Restricted Category	SRRC Declared Pest Animals or Weeds
Lantana (*Lantana camara*)	Direct – limit Koala movement	3	Yes
Feral Cat (*Felis catus*)	Direct – opportunistic predators	3,4,6	Yes
Wild dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*)	Direct – Key threatening process to Koala	3,4,6	Yes
Feral Pig (*Sus scrofa*)	Indirect – habitat damage	3,4,6	Yes
European Fox (*Vulpes vulpes*)	Direct – opportunistic predators	3,4,5,6	Yes
Feral Rusa Deer (*Cervus timorensis*)	Indirect – habitat damage	3,4,6	Yes
European Rabbit (*Oryctilagus cuniculus*)	Indirect – habitat damage		Yes

Wild dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) are considered direct threats to the MNES target species (Table 3). This conclusion is based on several federal government documents including:

- Conservation Advice for *Phascolarctos cinereus* (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory
- National Wild Dog Action Plan 2020 – 2030

Medium priority threats to Koala and Grey-headed Flying Fox include feral cat (*Felis catus*) and European fox (*Vulpes vulpes*). These species are not listed as a key threatening process to either of the MNES species however both are known to be opportunistic predators with significant impacts to native species.

It is also acknowledged that although they aren't listed as a direct threatening process to the target MNES species for the Project, feral pig (*Sus scrofa*) are opportunistic omnivores and will consume a wide range of animals including small mammals and birds. Feral Pigs are also widely known to cause significant environmental destruction to soil and vegetation via digging, spreading weeds and consumption, particularly surrounding waterbodies. Therefore, the presence of Feral Pigs within the offset site cause destruction of current habitat value and water resources, and indirectly impacting essential habitat areas for the listed MNES. This is similarly the case for feral rusa deer (*Cervus timorensis*) which are known to damage native vegetation, spread weed seeds and foul water and European rabbit (*Oryctilagus cuniculus*) which impact native vegetation.

Other identified specific threats within the ROA 3 include:

- Ploughing and re-harvesting the land for hay
- Cattle grazing
- Due to the use of the offset area as largely cropping land, it is not immediately impacted by significant weed infestations. Regardless, many invasive species, in particular *Lantana camara*, a declared restricted matter under the *Biosecurity Act 2014* and SRRC, occur all around the offset area and more broadly over the Offset Property. Once the cropping use is ceased and native vegetation is established across ROA 3, it is anticipated weed sources will be an ongoing challenge with the offset area. Therefore, weed management has been thoroughly addressed.

Table 3: Offset property major threats MNES species

MNES Offset Target Species	Major threats to MNES present within offset property
Koala (*Phascolarctos cinereus*)	• Encounter mortality from dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) • *Lantana camara* adversely affects the ability of Koalas to move between trees
Grey-headed Flying-fox (*Pteropus poliocephalus*)	• Barbed wire fencing (entanglement)

CONSERVATION BENEFITS OF THE ROSEVALE OFFSET PROPERTY

The MEO Rosevale offset property provides conservation benefit from a state and local planning and landscape context due to its relatively short distance from the proposed impact area (Plan 2). Additionally, a number of approved EPBC offsets for Koala and GHFF are present within 5 km of the site, indicating the area has been identified to contain values to support these MNES. The nearest existing offset for impacts on Koala Habitat has been approved for the Barrams Road project in Ripley (EPBC referral 2021/9005) on the Rosevale Offset Site. The Rosevale Landholding is also 2 km north of and connected by a large tract of remnant vegetation to a large MNES offset for impacts on Koala, Grey-headed Flying-fox and Greater Glider habitat associated with approved Audale offset (EPBC 2018/8340). Furthermore, the ROA 3 site is also approximately 5 km south-east of the large QTFN Koala and GHFF Offset site (EPBC Referral numbers 2016/7817 & 2016/7724). Furthermore, the closest conservation area is Moorang Wildlife Corridor, approximately 700 m south of the site, which forms a part of a regional corridor that connects through to a State corridor associated with Main Range National Park 3 km south-west of the site.

The offset site is considered to have the capacity to meet the offset requirements, connection to existing highly connected vegetation to provide habitat, and dominated by non-remnant areas that will act as receiving areas for rehabilitation and an increase in habitat value across the offset site. In addition, the location of the offset site adjacent to a state riparian biodiversity corridor and the same sub-bioregion as the impact site ensures the land will continue to provide habitat and fauna connectivity within the greater landscape. Upon EPBC Approval, the offset will be legally secured by a Voluntary Declaration (VDEC) under the State Vegetation Management Act and permanent securement mechanism to be approved by the department and proponent. Further, regional, state and landscape contextual values of ROA 3 and the broader Rosevale Offset Property are discussed in the following sections.

Although located within reasonable proximity of a number of MNES impact areas occurring in South East Queensland the broad conservation benefits of the MEO Rosevale offset property are realised through its achievement of multi-jurisdictional biodiversity outcomes. The major offset property is located within the same bioregional and sub-bioregional as three of the largest housing supply areas in South East Queensland, including the City of Greater Springfield and the Greater Ripley, Greater Flagstone and Yarrabilba Priority Development Areas (PDAs). To implement long planned infrastructure outcomes and housing targets these major development areas will continue to see reductions in MNES habitat through both direct and indirect impacts. The Rosevale Offset Project will protect and improve existing values and significantly reinstate and create new habitat strategically located within the same sub bio-regional ecological context where MNES habitat is being reduced (Figure 3 and Figure 4).

MEO's Rosevale offset property is large in scale (over 800 ha) and can cater for both very large and or and aggregation of smaller impacts within a single consolidated offset area and land holding. The site is diverse in existing environmental values with Assessment Units covering existing remnant vegetation, both immature and advanced regrowth vegetation and open paddocks designation for new habitat creation. Existing trees and habitat features provide the ideal foundation for seed harvest and expansion through revegetation. Additionally, the site includes ecosystems ranging from lower ridges, through foothills, flood plains and riparian waterways associated with the Bremer River and its tributaries. Evidence of MNES habitat features and species are observed over all parts of the site and through the surrounding fragmented and connected landscape.

Importantly, the land holding is owned outright by MEO and managed by full time employees with co-existing rural business uses. MEO intends to utilise the bulk of the suitable areas on the site for biodiversity offsets; this

is evidenced by the approval of EPBC referral 2021/9005 and the submission of three separate EPBC projects currently seeking to utilise the land for offset outcomes. Ownership of the Rosevale offset property holding provides greater direct commercial control from the proponent and the conditions of approval onto the Rosevale offset property to ensure offset outcomes are achieved and de-risks inadvertent third party non-compliant uses from occurring.

3. ENVIRONMENTAL OUTCOMES AND OBJECTIVES

This OMP identifies outcomes focused on management actions pursuant the EPBC Act, for the provision of Koala (*Phascolarctos cinereus*), Grey-headed Flying Fox (*Pteropus poliocephalus*), *Lathamus discolor* (Swift Parrot) and *Anthochaera phrygia* (Regent Honeyeater) habitat offset. The management objections for the ROA 3 offset, in alignment with EOP will:

- Deliver an overall conservation outcome that improves the viability of habitat for the Koala, GHFF, Swift Parrot and Regent Honeyeater.
- Provide a direct offset that is in proportion to the level of statutory protection that applies to Koala, GHFF, Swift Parrot and Regent Honeyeater habitat.
- Be of a size and scale proportionate to the residual impacts on Koala habitat, GHFF, Swift Parrot and Regent Honeyeater habitat.
- Effectively account for and manage the risks of the offset not being successful within the required management timeframe.
- Provide a conservation gain additional to what is already required by a duty of care or to any environmental planning laws at any level of Government.
- Be efficient, effective, timely, transparent, scientifically robust, and reasonable with appropriate transparent governance arrangements in place for measuring, monitoring, auditing and enforcing the management of the ROA 3 offset.

The MHQA baseline scores and proposed Environmental Outcomes including interim milestone targets for each MNES over the 20-year offset period are provided at Appendix A for Koala and Grey-headed Flying-fox, and Table 10 and Table 11 for the Swift Parrot and Regent Honeyeater.

Further information on the suitability of the ROA 3 in achieving the proposed environmental outcomes is presented in Sections 4 and 5 with regards to the conservation benefits and current values.

The achievement of environmental outcomes within the offset area will be measured using the baseline survey methodologies described in Section 5 and management actions to be implemented, described in Section 7 which includes implementation of a detailed Rehabilitation Management Plan. The management actions detailed in this OMP aim to achieve the offset targets conditioned in the EPBC Act approval that endeavour to protect, restore, and reconnect areas of Koala, GHFF, Swift Parrot and Regent Honeyeater habitat. The offset areas have been selected to represent populations that are genetically diverse and distinct and are free of disease of have very low incidence of disease.

The approval holder must apply assisted natural regeneration, reconstructive plantings and threat mitigation to achieve the outcomes outlined in the subsections below.

COMPLETION CRITERIA AND PERFORMANCE TARGETS

The management framework designed to achieve the proposed environmental outcomes summarised above are detailed in Section 7 of this OMP.

A summary of the management actions and their completion criteria required to achieve the environmental outcomes are provided in Table 4. The management actions will result in a net gain of the overall habitat quality for koala and grey-headed flying-fox over the period of effect of the offset through active management, maintenance, monitoring and reporting.

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

a) **completion criteria** are longer term time-bound values, specified for measurable parameters, that if attained and maintained ensure the plan's environmental outcomes are achieved; and

b) **performance targets** are time-bound short- and medium-term targets guided by prescribed management measures, for management interventions and environmental condition, that are used to monitor, evaluate, review and improve the effectiveness of the plan to offset impacts.

Tracking of progress against the environmental outcomes will be measured at milestone monitoring years using the baseline survey methodologies detailed in Section 5. A schedule of monitoring and reporting is provided in Section 3.

Table 4: Completion Criteria and Performance Targets

Management Action	OMP Section	Performance Target	Completion Criteria	Responsibility
Legally Secure Offset Area	Page 2	The offset site will be secured by Voluntary Declaration under the *Vegetation Management Act 1999* following approval and prior to the commencement of impact site activities.	The offset area will be permanently secured via a legal mechanism that is approved by the Land Holder and the Department. Draft terms of the permanent legal mechanism to be submitted for approval within 18 months of commencement of the action. Within 12 months of approval of the draft terms the offset site must be permanently secured.	Proponent
1 – Feral Animal Management	Section 7.1	• Complete additional offset area-specific baseline feral animal abundance surveys during Year 1. • Develop a targeted Pest Management Plan. • Suppress the occurrence of feral animal species including non-native vertebrate predators (namely wild dogs, European foxes and feral cats) and herbivores (wild pigs and deer) for the life of the offset.	Minimise mortality to MNES attributed to predator species to the greatest extent possible within the ROA 3 and impacts to MNES habitat for the life of the offset.	MEO / engaged pest management contractor
2 – Weeds of National Significance (WONS) Management	Section 7.2	All WONS will receive initial treatment within Year 1 of the offset to allow for planting works to commence.	Reduce WONS to below 5% within ROA 3 by the end of Year 2, with a particular focus on *Lantana camara* and maintained below 5% for the life of the offset.	MEO / engaged rehabilitation contractor

Management Action	OMP Section	Performance Target	Completion Criteria	Responsibility
3 – Fencing and Stock Management and Discontinuation of Cropping	Section 7.3	• All internal fencing within the ROA 3 area is to be fenced with fauna friendly livestock exclusion fencing OR removed entirely, followed by the removal of livestock from the ROA 3, and maintained for the life of the offset. • Unnecessary barbed wire fencing with potential entanglement impact to fauna will be removed from within ROA 3. • Discontinue cropping activities following the legal securement of the offset area.	• Nil stock breaches into offset area from years 2-20 (post completion of all fencing). • No reporting of stock impacts as justification for not achieving environmental outcomes and interim milestone targets.	MEO
4 – Access and Trespass Management	Section 7.4	• Maintain ROA 3 and offset property boundary fencing to manage external access for the life of the offset. • No new access tracks throughout ROA 3 unless to support offset outcomes.	No authorised access and incompatible activities from external sources.	MEO
5 – Regeneration and Restoration Management Strategy	Section 7.5	• Collect seed stock required for planting during Year 1. • Commence propagation with external nursery during Year 1. • Commence site preparation works in Year 1. • Commence broadscale planting in Year 2. • Establish photo monitoring locations and quadrat	• Rehabilitated areas are established, regenerated and mapped as remnant vegetation under Queensland's VMA successor legislation by year 20 which requires 70% of canopy height and 50% of expected cover according to the relevant Regional Ecosystem benchmark to be reached.	MEO / engaged rehabilitation contractor

Management Action	OMP Section	Performance Target	Completion Criteria	Responsibility
		monitoring following the completion of broadscale planting. • Implement the RMP (**Appendix F**) for the life of the offset.	• Site condition metrics for Koala and Grey-headed Flying-fox improves in accordance with environmental outcomes (see **Table 8** and **Table 9** and **Appendix A**). • Planting density of non-juvenile preferred foraging trees for Swift Parrot and Regent Honeyeater proposed in **Table 10** and **Table 11** and prescribed in the Rehabilitation Management Plan (**Appendix F**) are achieved by Year 20.	
6 – Bushfire Management	Section 7.6	• Develop and implement a Bushfire Management Plan during Year 1 in consultation with the local Queensland rural fire service, Scenic Rim Regional Council and adjoining landowners. • Maintain existing bushfire breaks between adjacent landholders, particularly along the property boundaries where the State Planning Policy bushfire hazard mapping indicates there is a 'high' or 'very high' risk of bushfire occurring.	• No record of high intensity fires in the offset area. • No record of MNES injury or death from fire. • Vegetation composition and restoration regime is not negatively affected by prescribed fire regimes.	MEO / engaged bushfire consultant

SUMMARY OF REPORTING FRAMEWORK

A range of report types will be prepared as part of the overall offset monitoring. The report types, timing and responsible party for each of the reports are detailed in **Table 5** below. These reports are referenced further in **Section 7** where relevant to the particular management actions.

Table 5: Summary of Monitoring Reports required

Report	Purpose	Frequency	Responsible party
Offset Area Annual Report *Details implementation of management actions against the OMP and RMP.*	Designed to document all offset activities completed and/or commissioned by the Offset Provider and demonstrated against the timeframes and completion criteria of the OMP. Required as part of the commercial agreement between the Proponent.	Annually following the legal securement of the offset area	Offset Provider
Milestone Survey Report *Details the results of MHQA, GHFF FHA and swift parrot and regent honeyeater foraging habitat assessment.*	Designed to demonstrate increase in value of offset area for Matters of National Environmental Significance (koala, grey-headed flying-fox, swift parrot and regent honeyeater) as proposed under the OMP.	Five-yearly at Years 5, 10, 15 and 20	Suitably qualified Ecologist as appointed by the Offset Provider
Photo Monitoring Report *Qualitative monitoring report showing photos of the offset area, commentary on rehabilitation progress and recommended adaptive management measures.*	Designed to provide regular assessment of the offset area and feedback to engaged rehabilitation contractors to guide on-ground works.	Quarterly during Year 1 Bi-annually from Years 2 to 5 Annually from Years 6 to 10	Suitably qualified Rehabilitation Contractor, Landscape Consultant or Ecologist as appointed by Offset Provider
Rehabilitation Monitoring Report *Details the results of the quadrat monitoring program, assessment against the performance indicators (Appendix 02) and recommendations for adaptive management.*	Designed to provide a data-driven method to document and measure rehabilitation progress/success to further inform on-ground activities.	Quarterly during Year 1 Bi-annually from Years 2 to 5 Annually from Years 6 to 10	Suitably qualified Ecologist as appointed by Offset Provider
Annual Compliance Report *Required to be prepared as part of the approved project decision notice.*	Designed to document activities and demonstrate compliance against the EPBC approval conditions for the project. Other subsidiary reporting may be included as evidence of compliance with approval conditions.	Annually, timing specified in approval conditions	Suitably qualified person as appointed by the Proponent

OAG PARAMETERS

The habitat scores derived for the offset area have been used to assess whether the proposed offset property could be viewed as suitable in respect to meeting the offset obligation for the proposed action, using the Commonwealth's Offset Assessment Guide (OAG) calculator. Values for the other parameters used in the calculator for Koala and Grey-headed Flying-fox are summarised in **Table 6** and in **Table 7** for the Swift Parrot and Regent Honeyeater.

Table 6: Offset Assessment Guide Parameters – Koala and Grey-headed Flying-fox

Parameter	Rationale
Quantum of Impact (Area)	11.34 ha for Koala and 11.34 ha for Grey-headed Flying-Fox.
Quantum of Impact (Quality)	A score of 6 for Koala and 6 for Grey-headed Flying-fox.
Risk Related Time Horizon	The proposed offset area will be legally secured via the VDEC/permanent mechanism; hence, the maximum score of 20 years.
Time Until Ecological Benefit	Measures prescribed in this Offset Management Plan are expected to achieve the predicted increase in habitat quality over a period of 20 years.
Start Area	41.3 ha
Start Quality	Refer **Table 8** and **Table 9.**
Risk of Loss without Offset	It is understood risk of loss is to be set at 0% without any comprehensive evidence to the contrary.
Risk of Loss with Offset	It is understood risk of loss is to be set at 0% without any comprehensive evidence to the contrary.
Confidence in Result (Risk of Loss)	As risk of loss is set at 0%, a high score of 90% is used for confidence in result.
Future Quality without Offset	Existing habitat quality is expected to be maintained if the current land use / management regime is continued, Under management for grazing over 20 years and without the offset, current habitat quality for Koala and Grey-headed Flying-fox is unlikely to improve, and some attributes may deteriorate where regrowth is subject to periodic clearing for cattle grazing and/or maintenance/fire regimes that are not compatible with ecosystem improvement are employed. Refer **Table 8** and **Table 9.**
Future Quality with Offset	Refer **Table 8** and **Table 9.**
Confidence in Result (Future Quality)	85% for all Assessment Units. This high level of confidence is supported by a detailed Rehabilitation Management Plan developed for the offset area. This is described in **Section 7** and provided at **Appendix F**.

Table 7: Offset Assessment Guide Parameters (Feature-based)– Swift Parrot and Regent Honeyeater

Parameter	Rationale
Quantum of Impact	Swift Parrot – 1755 features at Scenic impact site and 3339 features at Peninsula impact site for a combined impact of 5094. Regent Honeyeater – 1891 features at Scenic impact site and 2756 at Peninsula impact site for a combined impact of 4647.
Risk Related Time Horizon	The proposed offset area will be legally secured via the VDEC mechanism; hence, the maximum score of 20 years.
Start Value	Refer **Table 10** and **Table 11.**
Future Value Without Offset	Existing habitat quality is expected to be maintained if the current land use / management regime is continued. Under management for grazing over 20 years and without the offset, current habitat quality for Swift Parrot and Regent Honeyeater is unlikely to improve, and some attributes may deteriorate where regrowth is subject to periodic clearing for cattle grazing and/or maintenance/fire regimes that are not compatible with ecosystem improvement are employed. Refer **Table 10** and **Table 11.**
Future Value With Offset	Refer **Table 10** and **Table 11**
Confidence in Result (Future Quality)	85% for all Assessment Units. This high level of confidence is supported by a detailed Rehabilitation Management Plan developed for the offset area. This is described in **Section 7** and provided at **Appendix F**.

IMPACT COMPENSATION AND SCORING UPLIFT

A summary of proposed habitat quality uplift and the EPBC Act offset assessment guide impact compensation are included in **Table 8** to **Table 11**, below. The completed EPBC Act offset assessment guide calculator sheets are included at **Appendix B**.

Table 8: Koala impact compensation and scoring uplift (ROA 3)

Assessment Unit	Area (ha)	Habitat Quality Score		Offset Acquittal
		Baseline (rounded score)	Future	
AU1	37.9	3	7	109.18%
AU2	3.4	6	7	2.45%
Total	**41.3**			**111.63%**

Table 9: Grey-headed Flying-fox impact compensation and scoring uplift (ROA 3)

Assessment Unit	Area (ha)	Habitat Quality Score		Offset Acquittal
		Baseline (rounded score)	Future	
AU1	37.9	3	8	136.48%
AU2	3.4	3	8	12.24%
Total	**41.3**			**148.72%**

Table 10: Swift Parrot impact compensation (ROA 3 and ROA 4)

Assessment Unit	Start value	Future value without offset	Future value with offset (inclusive of 90% survival rate)	Impact compensation
SCENIC – AU1	0	0	20,205	90.45%
SCENIC – AU2	0	0	603	2.70%
PENINSULA – AU1	1113	1113	14,469	59.79
PENINSULA – AU2	434	434	740	1.36
Total	**1547**	**1547**	**36,017**	**154.30%**

Note:
Start value inputted as the existing number of non-juvenile preferred foraging trees
Future value without offset inputted as the existing number of non-juvenile preferred foraging trees
Future value with offset inputted as net total of preferred foraging trees (*i.e.,* number to be planted inclusive of a 90% survival rate + number of existing)

Table 11: Regent Honeyeater impact compensation (ROA 3 and ROA 4)

Assessment Unit	Start value	Future value without offset	Future value with offset (inclusive of 90% survival rate)	Impact compensation
SCENIC – AU1	0	0	19,801	97.16%
SCENIC – AU2	0	0	591	2.90%
PENINSULA – AU1	0	0	0	0%
PENINSULA – AU2	0	0	300	1.47%
Total	**0**	**0**	**20,692**	**101.54%**

Note:
Start value inputted as the existing number of non-juvenile preferred foraging trees
Future value without offset inputted as the existing number of non-juvenile preferred foraging trees
Future value with offset inputted as net total of preferred foraging trees (*i.e.,* number to be planted inclusive of 0.75 adjusted weighting for the count of supporting species and 90% survival rate + number of existing)

4. OFFSET SITE SUITABILITY

MNES HABITAT SUITABILITY

Analysis of threatened species records and regional ecosystem mapping across the offset site and surrounding area presents positive data on the potential for the region to provide significant conservation benefit to MNES listed species.

KOALA

Within the offset property, vegetated areas contain a dominant mix of locally important koala tree species as listed in Table 35 of the ANU *A review of Koala Habitat Assessment Criteria and Methods* (8.17 South East QLD, Table 35, Page 58). The ROA 3 is mostly devoid of vegetation with the exception of scattered large trees within the north-eastern extent and a patch of regrowth vegetation within the southern extent. A combination of existing Koala records from the ALA database (**Plan 5**), evidence of koala usage via SAT surveys and recorded presence of the species utilising vegetation within the offset property provide strong confidence in the value of the proposed restoration of ROA 3 for the Koala. Although the offset area itself contains limited vegetation and therefore limited Koala habitat, there is State KHA mapped directly south and west of ROA 3 (**Figure 8**). Both of these vegetation patches are contained within a proposed offset area for a separate EPBC project. Ultimately, improving vegetation coverage and species diversity, and reducing potential threats within ROA 3 as a part of this project is highly conducive to improving habitat for Koala within the region. Restoring vegetation within this area improve Koala movement opportunities and provide a wider area of foraging and breeding habitat.

Further supporting evidence for the site to contain a high potential to support this species is pre-clear mapping (**Figure 10**) and actual on-site vegetation communities surrounding ROA 3. The Rosevale Offset Property contains a broad distribution of the following regional ecosystem types (code plus dominant Species), which are dominated by Koala habitat and foraging trees:

12.3.3 – *Eucalyptus tereticornis*, *Eucalyptus crebra*, *Eucalyptus moluccana*

12.8.17 - *Eucalyptus melanophloia, Eucalyptus crebra, Eucalyptus tereticornis, Corymbia intermedia*

12.8.16 – *Eucalyptus melliodora, Eucalyptus crebra, Eucalyptus tereticornis*

12.8.14 – *Eucalyptus eugenioides, Eucalyptus biturbinata, Eucalyptus melliodora*

The majority of ROA 3 contains Category X (non-remnant) vegetation due to the historical and current land use for cropping and grazing activities. Pre-clear mapping indicates that Endangered RE 12.3.3 and Least Concern RE 12.8.17 were previously mapped across the area (**Figure 10**). In addition, a small patch of Category C (regrowth) vegetation described as least concern RE 12.8.17/12.8.14 is located within the southern extent of the ROA 3 site. The rehabilitation and restoration activities proposed with this project will implement vegetation from these regional ecosystems.

GREY-HEADED FLYING-FOX

Underlined flora species in the above regional ecosystems are additionally listed as significant food plants for the Grey-headed Flying-fox (Eby & Law 2008). Although ROA 3 contains limited vegetation with exception to some scattered trees in the north-eastern extent and a patch of regrowth in the southern extent, the surrounding landscape contains over 500 ha of foraging vegetation for the species. Therefore, improvement of ROA 3 via management measures proposed with this project, re-planting, stock management, pest control and removal of internal barbwire fences where stock has been removed, has the potential to increase safe foraging habitat for Grey-headed Flying Fox (GHFF) and protect it in perpetuity. This species is known to the region, with GHFF recorded foraging within vegetation associated with the approved Aroona Offset Site (EPBC 2016/7817), which is 5 km north of ROA 3. Furthermore, the Rosevale offset property is located approximately 14 km from the Mount French GHFF roosting camp [288], 31 km from the Laidley Plainlands Roost [372] and 36km from the Kooralbyn roost [551] (refer Plan 5).

Records under the National Flying Fox web viewer vary with the most recent surveys confirmed at the Kooralbyn and Laidley site. All the sites, excluding Laidley, which is under Ipswich City Council jurisdiction, are listed as active under the Scenic Rim Regional Council Flying-Fox Management Strategy 2023-2028 (SRRC, 2023a). The DCCEEW species profile and threats database for GHFF indicates that this species is capable of nightly flights of up to 50 km from their roost to forage in a variety of different feeding areas. Therefore, the surrounding roosts are all within a reasonable distance from the offset area that it is likely GHFF would forage within the current foraging habitat present surrounding ROA 3.

SWIFT PARROT

Swift Parrots are usually seen in small parties of up to 30 birds, or occasionally in flagger flocks (of several hundred birds) around sources of abundant food. Swift Parrots breed in Tasmania and then move to mainland Australia in Autumn for the non-breeding season. They feed preferentially in the largest trees available (Kennedy and Overs, 2001) and on psyllid lerps, seeds and fruit (Kennedy and Tzaros, 2005). Commonly used lerp infested trees include Inland Grey Box (*E. macrocarpa*), Grey Box (*E. moluccana*), Blackbutt (*E. pilularis*), and Yellow Box (*E. melliodora*). Preferred foraging tree species include winter flowering species such as Swamp Mahogany (Eucalyptus robusta), Spotted Gum (*Corymbia maculata* or *C. citriodora*), Red Bloodwood (*C. gummifera*), Forest Red Gum (*E. tereticornis*), Mugga Ironbark (*E. sideroxylon*), and White Box (*E. albens*) (DCCEEW, 2024).

A review of State vegetation mapping indicates that the pre-clear Regional Ecosystems mapped for the Offset Area include commonly used foraging species for the Swift Parrot, including *Eucalyptus tereticorni*s and *E. melliodora*. Due to historical clearing for agriculture activities, mature eucalypts are currently sparse within the Category X (non-remnant) vegetation areas located within the offset area.

No Swift Parrot populations or individuals have been recorded within 10 km of the offset area. A search of the ALA database using a 10 km search radius from the offset area returned no records for the species, however, there are several records for the species within 40 km buffer. A regional habitat analysis combining potential habitat and records of this species is shown on Plan 7.

Field surveys identified one preferred foraging species, *Eucalyptus tereticornis* (Forest Red Gum) scattered within the current open paddock offset area. Given the proposed reconstruction of Regional Ecosystems that

support foraging species, and the highly mobile nature of the winter foraging Swift Parrot with records in the vicinity, the proposed offset is considered suitable to support the matter.

REGENT HONEYEATER

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 and the Australian Capital Territory, to central Victoria. Records are widely distributed across its range, however, is only found regularly at a few localities in NSW and Victoria where most of the sightings have been recorded. There are four known key breeding areas, three in New South Wales and one in Victoria.

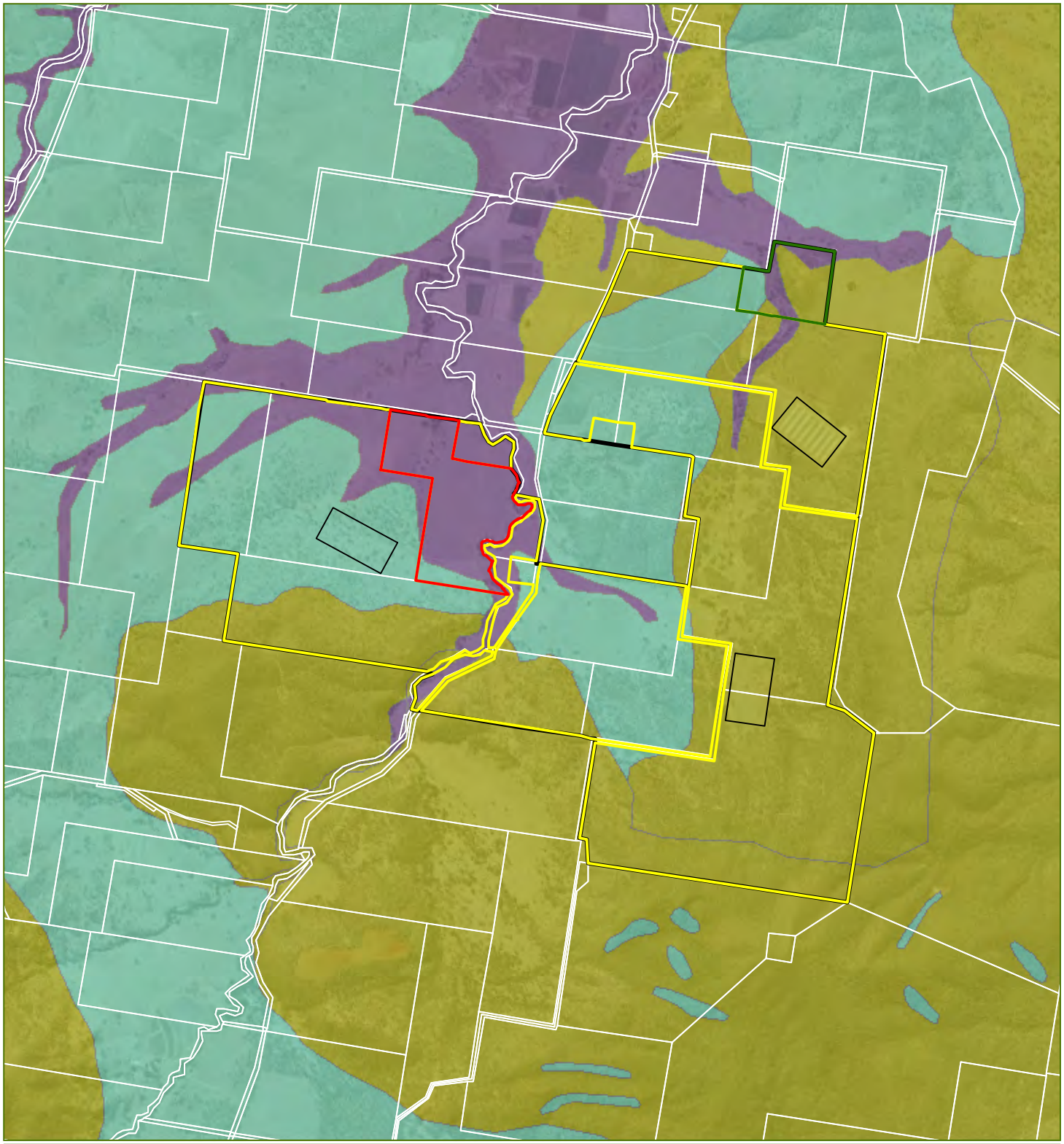
The species mostly inhabits inland slopes of the Great Dividing Range, in areas of low to moderate relief with moist, fertile soils. It is most commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest, but also inhabits riparian vegetation such as sheoak (*Casuarina* sp.) where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

Like other species of honeyeater, the Regent Honeyeater utilises a variety of food resources. Its 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. Nectar is obtained chiefly from eucalypts and mistletoe, and Regent Honeyeaters appear reliant on select species which provide reliable nectar flows. Regent Honeyeaters prefer taller and larger diameter trees for foraging, as these typically produce more nectar (Franklin et al., 1989; Webster & Menkhorst 1992; Menkhorst et al., 1999; Oliver 2000). Preferred foraging tree species for the Regent Honeyeater include *Eucalyptus sideroxylon, Eucalyptus melliodora, Eucalyptus albens, Eucalyptus leucoxylon, Corymbia maculata/citriodora*, *Eucalyptus robusta*. Mistletoe species important for foraging include *Amyema cambagei, A. miquelii* and *Dendropthoe vitellina*.

A review of State vegetation mapping indicates that the pre-clear Regional Ecosystems mapped for the Offset Area include eucalypt foraging species that could be utilised by the Regent Honeyeater. Due to historical clearing for agriculture activities, mature eucalypts are currently sparse within the Category X (non-remnant) vegetation areas located within the offset area.

No Regent Honeyeater populations or individuals have been recorded within 10 km of the offset area. A search of the ALA database using a 10 km search radius from the offset area returned no records for the species, however, there are records for the species within 40 km of the offset area indicating broader foraging patterns. A regional habitat analysis combining potential habitat and records of this species is provided in Plan 8.

Given the proposed reconstruction of Regional Ecosystems that support foraging species, and the highly mobile nature of the winter foraging Regent Honeyeater with records in the vicinity, the proposed offset is considered suitable to support the matter.



Legend

- Qld DCDB
- Approved Offset Boundary
- Future Offset Boundary
- Springfield - Peninsula Offset Boundary
- Proposed Poultry Shed, 100m buffer area & access tracks
- Offset Properties

Biodiversity Status of Pre-Clear Regional Ecosystems

- Endangered
- Of Concern
- Not of Concern

Figure 10

Qld Pre-Clear Vegetation and Biodiversity Status Mapping

File ref. 10559 E Figure 10 OMP_P PreClear A
Date 23/10/2025
Project Rosevale Offset Area 3 - Peninsula Precinct

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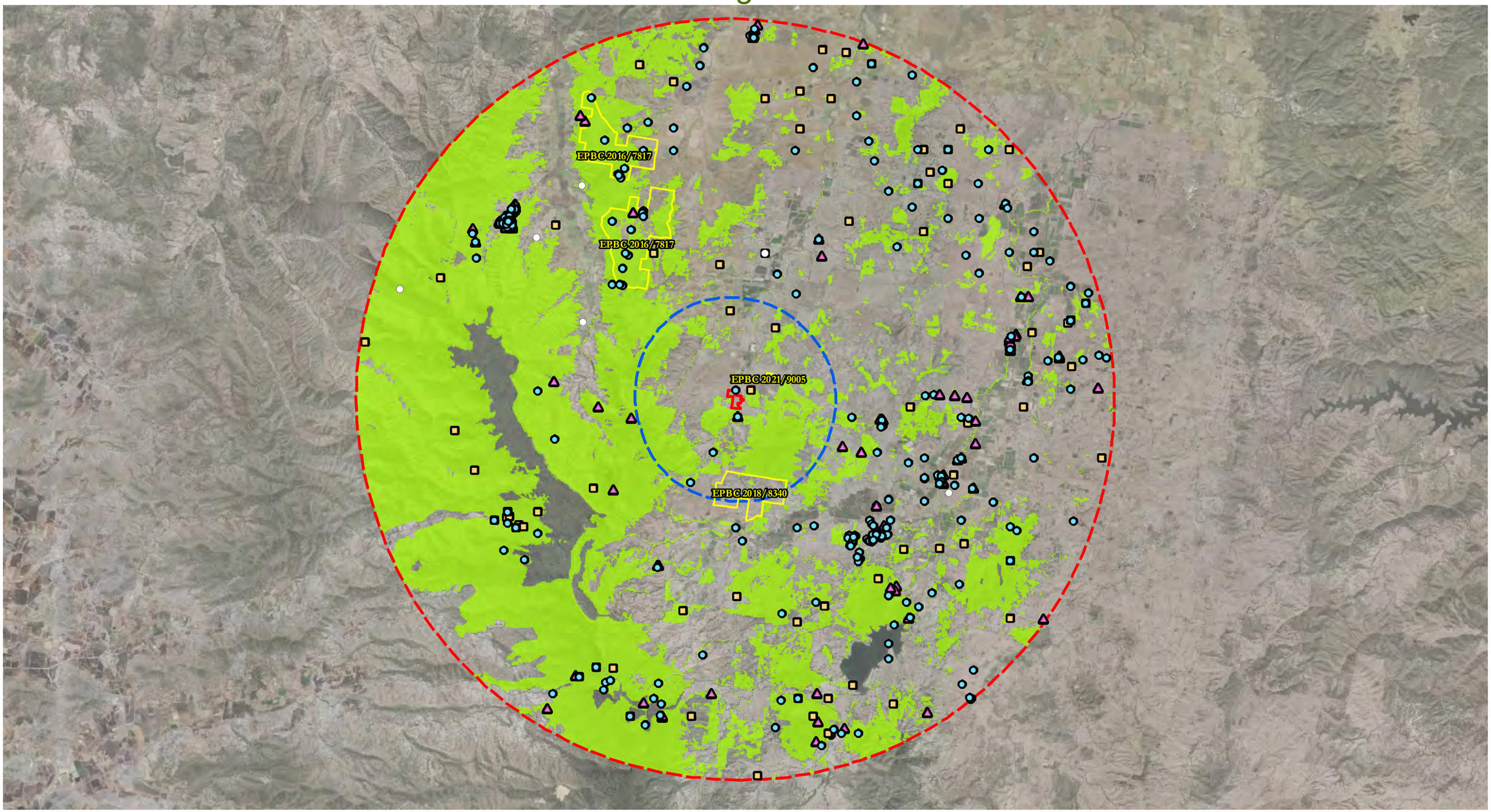
0 200 400 600 800 1,000 m

Scale (A4): 1:30,000 [GDA 2020 MGA Z56]

Montauban Environmental Offsets

Layer Source: © State of Queensland 2025

5. Koala Context Assessment - Wider Region



Montauban Environmental Offsets

References:
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Project: Rosevale Offset Area 3t

Date: 23/10/2025

10559 E 05 OMP_P Koala Regional Context Assessment A

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Co-ordinate System: GDA2020 MGA Zone 56

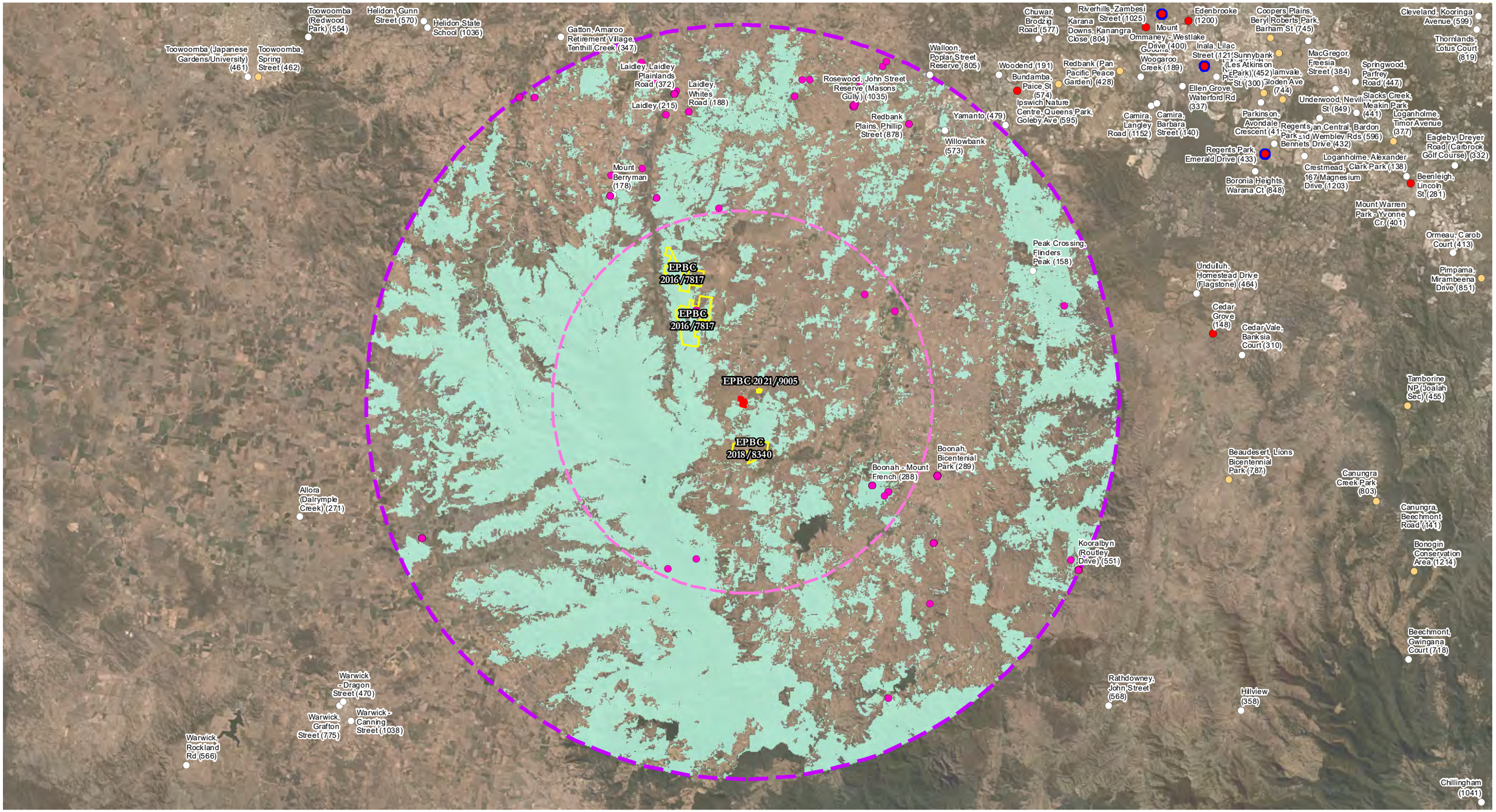
Legend

- Offset Area
- 5km Offset Area Buffer
- 20km Offset Area Buffer
- Potential Koala habitat within 20km of Offset Area [42.4%]
- Existing Approved Koala Offset

Koala Records within 20km of Site (ALA, 2025)

- Koala (*Phascolarctos cinereus*) Records within 20km of Offset Area recorded within the last 5 years - 187
- Koala (*Phascolarctos cinereus*) Records within 20km of Offset Area recorded between 5 and 20 years ago - 350
- Koala (*Phascolarctos cinereus*) Records within 20km of Offset Area recorded without a sighting date - 33
- Koala (*Phascolarctos cinereus*) Records within 20km of Offset Area recorded over 20 years ago - 88

6. Grey-headed Flying-fox Context Assessment - Wider Region



Montauban Environmental Offsets

References:
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Project: Rosevale Offset Area 3

Date: 23/10/2025

10559 E 06 OMP_P GHFF Regional Context Assessment A

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Co-ordinate System: GDA2020 MGA Zone 56

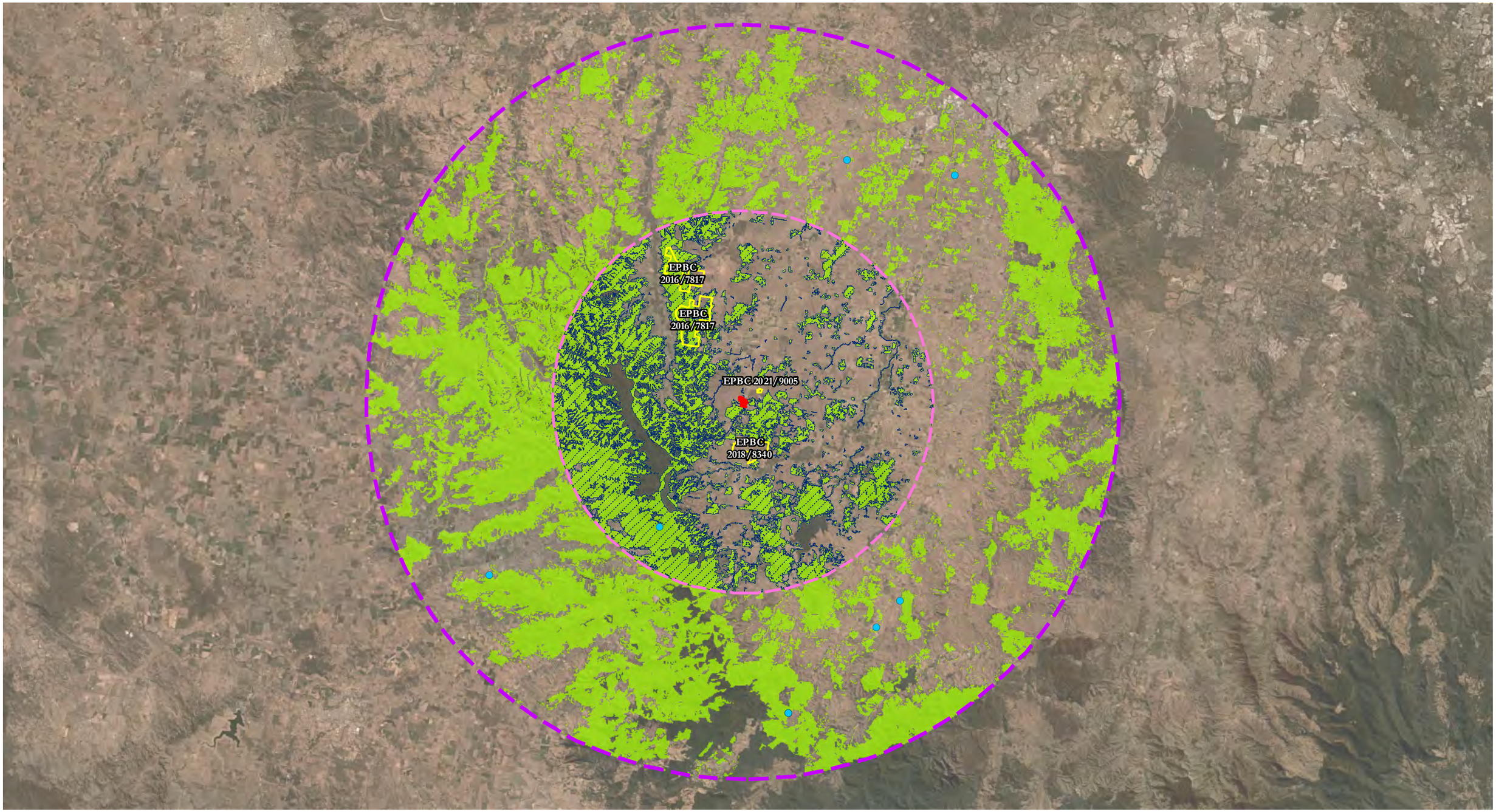
Legend

- Offset Area
- Existing Approved Grey-headed Flying-fox Offset
- Offset Area 40km Buffer
- Offset Area 20km Buffer
- Offset Area 40km buffer area - Potential and Known Grey-headed Flying-fox Foraging Habitat [43%]
- Grey-headed Flying-fox records within 40km of offset area - 124

National Flying-fox monitoring data (Fed Gov. 2024.)

- Grey-headed Flying-fox roost inactive within recent surveys [9 within 40km of offset area]
- Grey-headed Flying-fox roost active within recent surveys [2 within 40km of offset area]
- Grey-headed Flying-fox roost active within recent surveys with a population level of 3 or above [1 within 40km of offset area]
- Nationally significant Grey-headed Flying-fox roost active within recent surveys
- Nationally significant Grey-headed Flying-fox roost active within recent surveys with a population level of 3 or above

7. Swift Parrot Context Assessment - Wider Region



Montauban Environmental Offsets

1:400,000

0 2 4 6 8 km

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
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Project: Rosevale Offset Area 3

Date: 23/10/2025

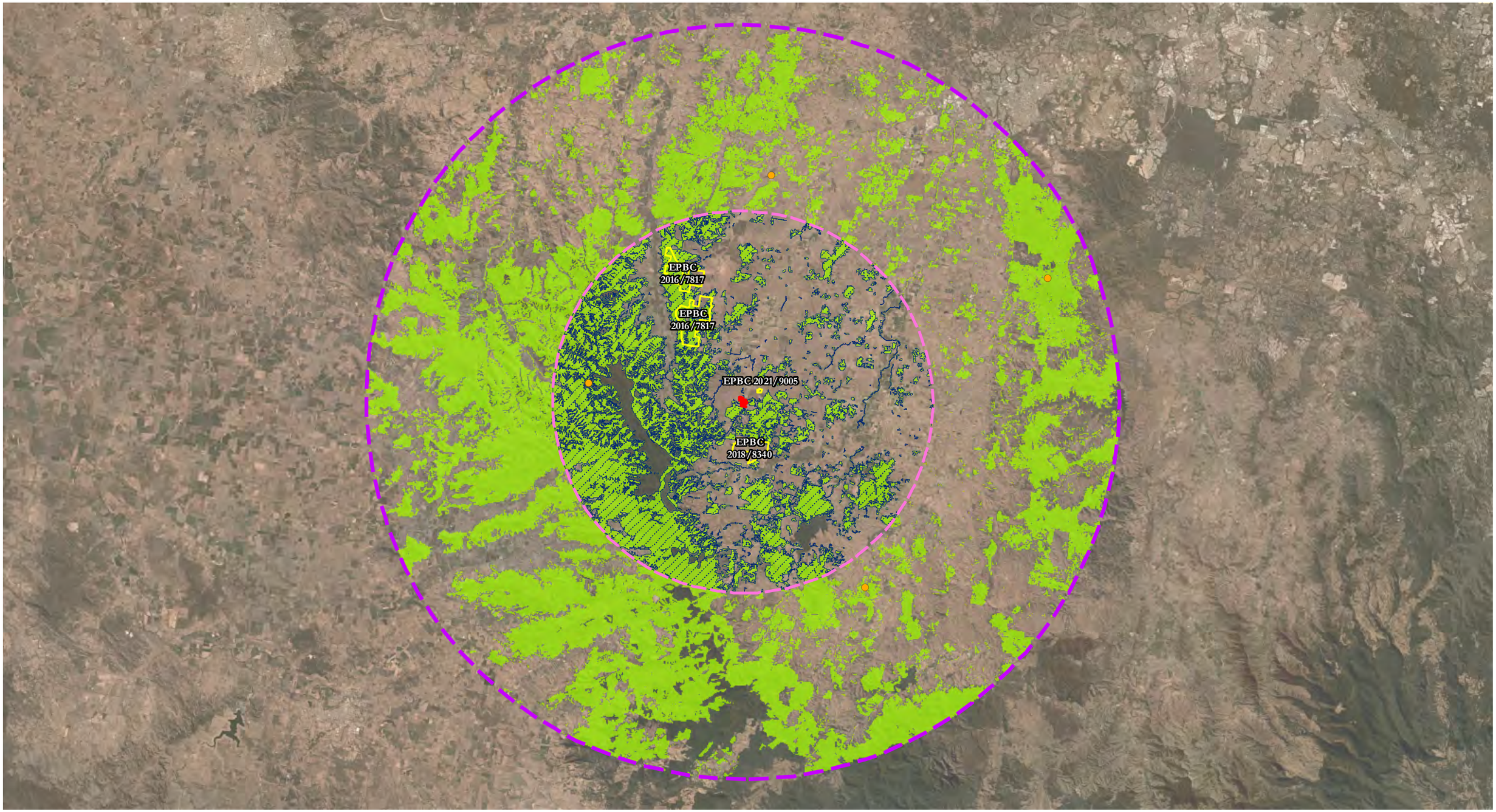
10559 E 07 OMP_P SP Regional Context Assessment A

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Legend

- Offset Area
- Existing Approved Swift Parrot Offset
- Offset Area 40km Buffer
- Offset Area 20km Buffer
- Swift Parrot records within 40km of offset area [8]
  Note: Records are generalised on a grid system for protection of the species.
- Potential and known Swift Parrot foraging habitat within 40km of Offset Area
- Potential and known Swift Parrot foraging habitat within 20km of Offset Area [39.5%]

8. Regent Honeyeater Context Assessment - Wider Region



Montauban Environmental Offsets

1:400,000

0 2 4 6 8 km

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
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Project: Rosevale Offset Area 3

Date: 23/10/2025

10559 E 08 OMP_P RH Regional Context Assessment A

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Legend

- Offset Area
- Existing Approved Regent Honeyeater Offset
- Offset Area 40km Buffer
- Offset Area 20km Buffer
- Regent Honeyeater records within 40km of offset area [5]
  Note: Records are generalised on a grid system for protection of the species.
- Potential and known Regent Honeyeater foraging habitat within 40km of Offset Area
- Potential and known Regent Honeyeater foraging habitat within 20km of Offset Area [39.5%]

OFFSET SUITABILITY AND COMPLIANCE ANALYSIS

The objective of this OMP is to outline appropriate management actions which achieve the offset outcomes specified within the EPBC Act and provide an overall improved conservation outcome and net gain in MNES habitat and thereby ensuring the long-term viability of Koala, GHFF, Swift Parrot and Regent Honeyeater populations.

The implementation of this OMP will enhance habitat for MNES through improvements to vegetation, reduction and key threats and provision of shelter and safe movement opportunity. Table 12 lists the principles of the EPBC Act Environmental Offsets Policy and describes how the proposed offset strategy has been developed to adhere to these principles.

Table 12: Compliance with EPBC Act Environmental Offsets Policy Principles

Principle	Offset Strategy Compliance
Deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the proposed action	The offset area delivers a conservation gain for the Koala, GHFF, Swift Parrot and Regent Honeyeater through the creation of 37.9 ha of new habitat and reconstruction/assisted natural regeneration of 3.4 ha of sparse regrowth vegetation. a) The revegetation zone proposed for the ROA 3 includes 37.9 ha of area located on the alluvial rich soils and MNES assisted rehabilitation within 3.4 ha of existing regrowth vegetation. The land is currently seeded for the growth of hay grass during season and directly grazed outside of harvest. b) Trees adjoining to the south include preferred Koala and GHFF species and contains State mapped Koala Habitat Area. Additionally, trees within the north along the Moorang Lane road reserve are dominated by large *Eucalyptus tereticornis* which are preferred foraging species for the Swift Parrot. c) Koala scat has been consistently found in the trees in the road reserve to the north, in vegetation to the south and along the Bremer River to the north and west showing all surrounding areas are used by the species. Further, where vegetation occurs over the wider Rosevale property Koalas have been observed. d) The area proposed for revegetation is mapped as RE12.3.3, RE 12.8.17 and RE12.8.14 described as mixed woodland dominated by eucalypt species on Cainozoic igneous rocks. Dominant trees species within these ecosystems contain preferred foraging trees for the Koala, Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater. e) Averting the direct and indirect losses via declaring the land a Voluntary Declaration area for High Value Conservation under the Queensland *Vegetation Management Act 1999* will remove current cropping and grazing practices and prevent incompatible land uses. f) In isolation, the 41.3 ha replanting zone will connect the Moorang Lane road reserve trees to the regrowth koala habitat to the south within the site. The location of ROA 3 adjacent to several EPBC offset properties will create a major habitat node along the Bremer River

Principle	Offset Strategy Compliance
	which presently only retains a narrow strand of vegetation on either bank. g) As part of the balance offset the land holding contributes nearly 800 ha in conservation land containing large tracts of cleared land which will connect and improve areas of regrowth and remnant vegetation with the Bremer River and major surrounding tracts of bushland which ultimately connect with the Main Range Nation Park.
be built around direct offsets but may include other compensatory measures	The offset area includes legally securing the land area and undertaking necessary management to complete revegetation in a cleared paddock and assisted rehabilitation of regrowth areas to achieve 111.63% of the offset required for Koala impacts and 148.72% of the offset for Grey-headed Flying-fox. The combined impact and offset assessment for Springfield City Group's EPBC 2020/8629 (Peninsula Precinct) and EPBC 2020/8651 (Scenic Precinct) for the Swift Parrot and Regent Honeyeater will achieve 101.54% of offset requirements for Regent Honeyeater and 154.30% of offset requirements for the Swift Parrot. Planting obligations will be delivered across both the ROA 3 (Peninsula Precinct) and adjoining ROA 4 (Scenic Precinct) and will be delivered concurrently to achieve the proposed offset outcomes. A minimum of 100% of the offset required is built around direct offsets.
be in proportion to the level of statutory protection that applies to the protected matter	Within this application the Koala and the GHFF are assessed as Vulnerable. Under the International Union for Conservation of Nature (IUCN) data the probability of annual extinction is 0.2 %. The Swift Parrot and Regent Honeyeater are assessed as Critically Endangered with an annual extinction probability of 6.8 %. This factor applies through the meta data of the Offset Guide assessment calculation sheets for which each species has been assessed as achieving greater than 100% offset through the proposed offset area (Appendix B).
be of a size and scale proportionate to the residual impacts on the protected matter	Direct and indirect impacts for the protected matters have been calculated at the impacts site using the Modified Habitat Quality Assessment (MHQA) for the Koala and the Foraging Habitat Assessment (FHA) methods for Grey-headed Flying-fox, Swift Parrot and Regent Honeyeater. Within the OAG the Quantum Impact for each species is listed as: • Koala (11.34 QI ha) • Grey-headed Flying-fox (11.34 QI ha)

Principle	Offset Strategy Compliance
	• Swift Parrot (3339 habitat features impacted at Peninsula and 1755 features at Scenic for combined offset assessment) • Regent Honeyeater (2756 habitat features impacted at Peninsula and 1891 features at Scenic for combined offset assessment) To achieve the offset required for these impacts, the offset area provides a direct land-based outcome over 41.3 ha entirely through habitat recreation activities on historically cleared land devoid of native vegetation. The percentage of the impacts acquitted through this offset is: • Koala – 111.63 % • Grey-headed Flying-fox – 148.72 % • Swift Parrot – 154.30 % • Regent Honeyeater – 101.54 %
effectively account for and manage the risks of the offset not succeeding	The offset area forms part of the balance land of a much larger offset strategy covering nearly 800 ha of land. At this scale resourcing required to deliver, maintain and manage the risks is significantly increased compared to smaller offsets area. This OMP identifies 7 key risks / threats to some, or all, of the offset principles and outcomes not being achieved. These are: • Wildfire • Drought • Shifting habitat range • Plant stock failure • Feral animal control • Weeds of National Environmental Significance (WONS) increasing, and • Livestock control, access and trespass management Each of these risks have influenced the specific management actions proposed in the relevant assessment units where the risk may occur and more importantly the monitoring, measuring of success and adaptive management for the offset succeeding. Further, the offset provider intends to engage third party, suitably qualified professional(s) to ensure that the management outcomes of the offset land are achieved and risk of the offset not succeeding is mitigated. Repetitive monitoring and survey replication is to be a feature of the OMP to ensure adaptive management changes are made as soon as identified and throughout the life of the offset. In addition to completion criteria, interim milestones will be developed for each management measure.

Principle	Offset Strategy Compliance
be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs	The Peninsula Precinct project occurs in the Springfield Structure Plan area declared by the State Government as a priority area for development. There are few environmental controls at the impacts site with the Queensland Government's *Environmental Offset Act 2014* not being applicable. There are no guidelines or controls around offset or rehabilitation for the Grey-headed Flying-fox, Koala, Swift Parrot and Regent Honeyeater. The offset area is currently utilised for various rural activities and is not protected or managed for conservation purposes. The southern allotments of the offset property fall within the mapped extent of *Regional Biodiversity Corridor 101 described as Kangaroo Mountain to Rosewood Corridor: Extends from Kangaroo Mountain* (Main Range National Park) through to Mt Walker and Rosewood. Regional (5 km). All habitat protection and habitat creation is supported by this strategic intent and importantly the land is not located within an area at threat of new development expansion, new road or rail upgrades or extractive resource uses. Similarly, Moorang Wildlife Corridor, south of the offset property, forms a direct connection to the vegetation within the offset site. As of October 2022, *Scenic Rim Regional Council* committed to a 50 percent increase in funding for their Environmental Grants Program. This budget increase benefits community groups and landholders that are working towards enhancing the Scenic Rims natural environment, preserving habitat for rare and threatened species and improving the quality of Scenic Rim waterways. This is inclusive of landholders who are working to reduce/eliminate wild pigs spreading weed seeds and eroding riparian areas in the Moorang area. However, this is not required by law and is instead encouragement to improve land values across the region. Considering the majority of the properties surrounding the offset area are used for cropping and agriculture and how large, time consuming and expensive a task managing revegetated areas can be, it is considered entirely beneficial that 41.3 ha of land be offset under this project. Therefore, without the triggering of the EPBC Act and subsequent requirement to obtain approval, the offset as proposed in the OMP is not required for any of the protected matters under State or Local legislation. Additionally, the offset area would not be protected in perpetuity for conservation purposes.
be efficient, effective, timely, transparent, scientifically	Through conditions of approval the offset area will be legally secured prior to the commencement of any clearing on the impact site. The offset area and its value (as finalised through the EPBC Act Approval) will, in the first instance, be legally secured through a Voluntary Declaration (VDEC)

Principle	Offset Strategy Compliance
	declared under the Queensland Government's *Vegetation Management Act 1999*. A VDEC protects land and values and is binding on future owners. The declaration and management plan will be noted on the land title, which informs prospective buyers of current declarations and management plans and where copies are available. This information is important to the property market as future owners will be bound by the plan and declaration. The legally securing of the land will be made through declaring the area as having High Nature Conservation Values. The VDEC will be lodged and legally secured by evidence of encumbrance on Registered Land Title prior to the commencement of any clearing works on the Impact Site. Following the VDEC, the offset area will be permanently secured via a legal mechanism that is approved by the Land Holder and the Department. Draft terms of the permanent legal mechanism to be submitted for approval within 18 months of commencement of the action. Within 12 months of approval of the draft terms the offset site must be permanently secured. The OMP schedules a list of existing or specifically designed scientific methodologies for the measuring of base line and improved outcomes for the protected matters. Detailed baseline studies have been occurring over the approved offset areas and are used to inform the outcomes of this version of the OMP. The OMP also requires the use of tertiary trained and experienced experts along with appropriately certified and experienced contractors for the implementation of a host of actions.
have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	The offset property is owned by a large rural enterprise who has a variety of rural activities occurring on-site. The third party offset provider will fund all actions listed as approved in an offset management plan. An executed legal contract (Offset Provider Deed) is in place outlining the legal and committed relationship of the funding and delivery of the offset outcomes. Clearly articulated goals are set within this OMP for each proposed action within each Assessment Unit or Environmental Management Zone. Collectively, these goals link directly to the achievement of the overall conservation gain for the protected matters as designed, assessed and calculated through the selection and delivery of the offset. The management actions and implementation schedule to be included in the offset management plan are designed to be measured, monitored, audited and enforced year upon year during the life of the offset.

5. BASELINE SURVEYS

A number of technical survey methodologies have been deployed at the offset area to assist in the assessment of baseline values and informing offset outcomes. Surveys were completed by a suitably qualified field ecologist (**Appendix C**). These are documented in detail in this section and include:

- Assessment Unit delineation
- Koala Habitat – Modified Quality Habitat Assessment Tool
- Grey-headed Flying-fox – Foraging Habitat Assessment
- Swift Parrot – Foraging Habitat Assessment
- Regent Honeyeater – Foraging Habitat Assessment
- Baseline Weed Surveys
- Baseline Pest Surveys

Refer to **Table 13** and the subsections below for specific details on survey dates for each method applied.

Table 13: Baseline field surveys methods summary

Date	Temperature	Rainfall (mm)	Methods implemented
20 April 2023	10.1°C min – 27.3°C max	0	Tranche 1 camera installation, weed surveys
24 April 2023	12.8°C min – 27.3°C max	0	Weed surveys
27 April 2023	No data available min – 24.6°C max	0	Weed surveys
4 May 2023	4.5°C min – 27.4°C max	0	Tranche 1 camera collection
5 May 2023	8.0°C min – 25.5°C max	0	Weed surveys
15 May 2023	15.3°C min – 23.1°C max	8.8	Tranche 2 camera installation
11 August 2023	2.7°C min – 28.2°C max	0	Tranche 2 camera collection, Tranche 3 camera installation
2 November 2023	9.7°C min – 29.0°C max	0	Tranche 3 camera collection
21 February 2024	18.9°C min – 31.9°C max	0	MHQA transects, SATs, stem density counts
1 October 2025	12.5°C min – 31.6°C max	No data available	MHQA transects, SATs, stem density counts

Source: Bureau of Meteorology station 040004 Amberley AMO QLD (Temperature) and 40400 Moorang (Rainfall).

ASSESSMENT UNITS

The broader Rosevale offset property is characterised by three broad assessment units (AUs) (**Plan 9**):

- Assessment Unit 1 – Historically cleared open paddocks and dead plantation trees
- Assessment Unit 2 – Regrowth eucalypt forest
- Assessment Unit 3 – Remnant eucalypt forest

The ROA 3 is delineated into Assessment Unit 1 (Non-remnant Paddock RE 12.3.3) and Assessment Unit 2 (Sparse Regrowth RE 12.8.17/12.8.14). Refer to Plan 10 for the ROA 3 Assessment Units.

Assessment Unit 1 – Non-remnant Paddock RE12.3.3

AU 1 consists of historically cleared open paddocks. This AU is characterised by its lack of structural complexity with a generally absent native tree, shrub and forb species presence and is dominated by native grass species such as, *Heteropogon refractus, Imperata cylindrica* and *Themeda triandra* (Photo Plate 1). This AU contains sporadic weed infestations with *Lantana camara* infestations observed throughout the area. AU 1 contains limited habitat values for MNES.

Assessment Unit 2 – Sparse Regrowth RE12.8.17/12.8.14

AU 2 consists of sparse regrowth dominated by RE12.8.17. The area contains a characteristic of regrowth vegetation including small-stemmed eucalypt trees with a sparse overstorey (Photo Plate 2). The vegetation is dominated by *Eucalyptus crebra* with E*. melanophloia, Corymbia tessellaris, C. intermedia* and *Acacia leiocalyx*.

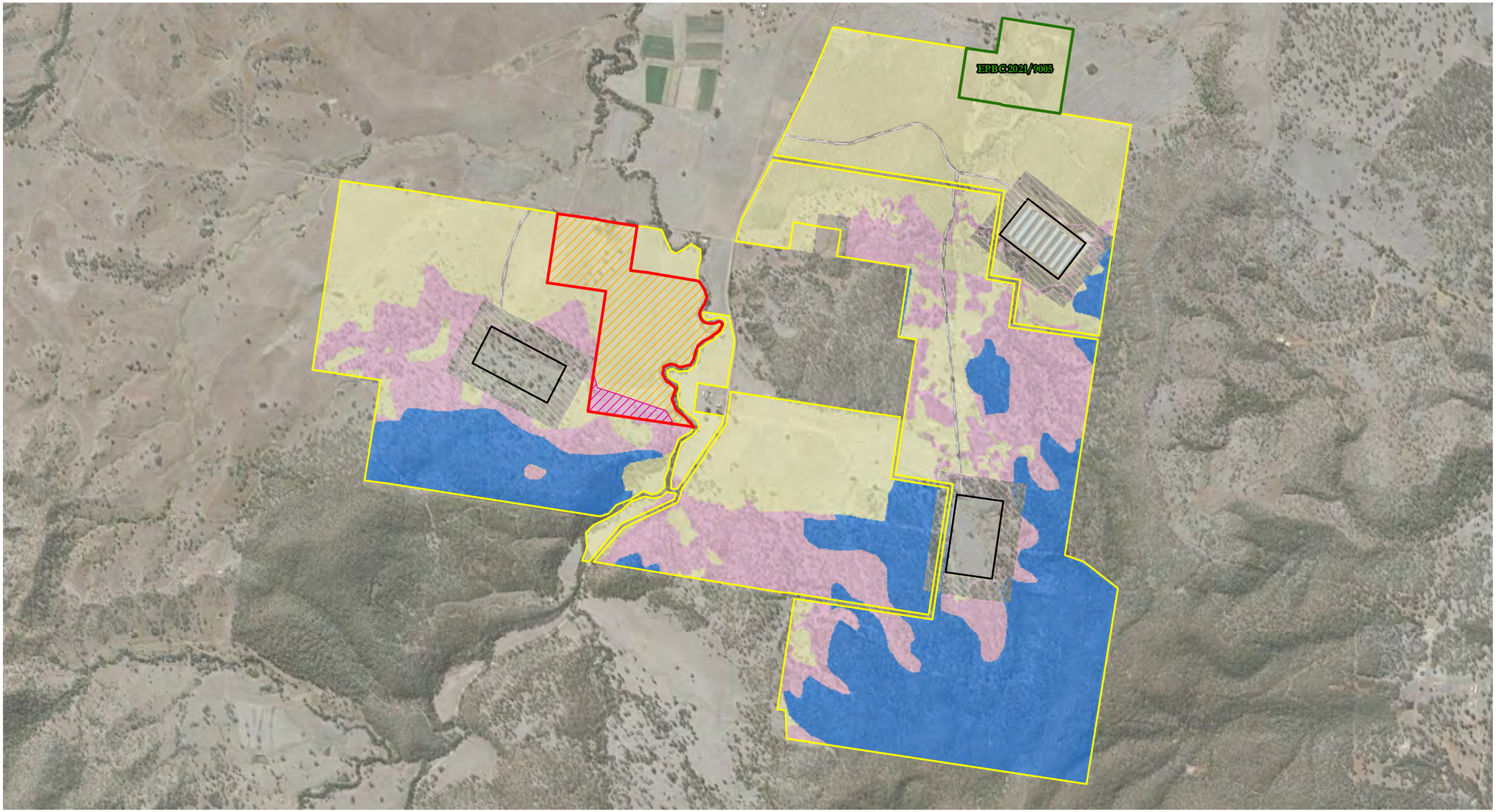


Photo Plate 1: AU1 – Non-remnant Paddock Vegetation



Photo Plate 2: AU2 – Sparse Regrowth Vegetation

9. Offset Property Assessment Units



Montauban Environmental Offsets

1:17,500

0 100 200 300 400 m

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
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Project: Rosevale Offset Area 3

Date: 23/10/2025

10559 E 09 OMP_P Offset Property Assessment Units A

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Legend

- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Chicken sheds
- Poultry shed access track

Vegetation Assessment Units (Offset Property)

- **AU-1:** Non-Remnant Vegetation [327.4 ha]
- **AU-2:** Regrowth Vegetation [145.6 ha]
- **AU-3:** Remnant Vegetation [179.3 ha]

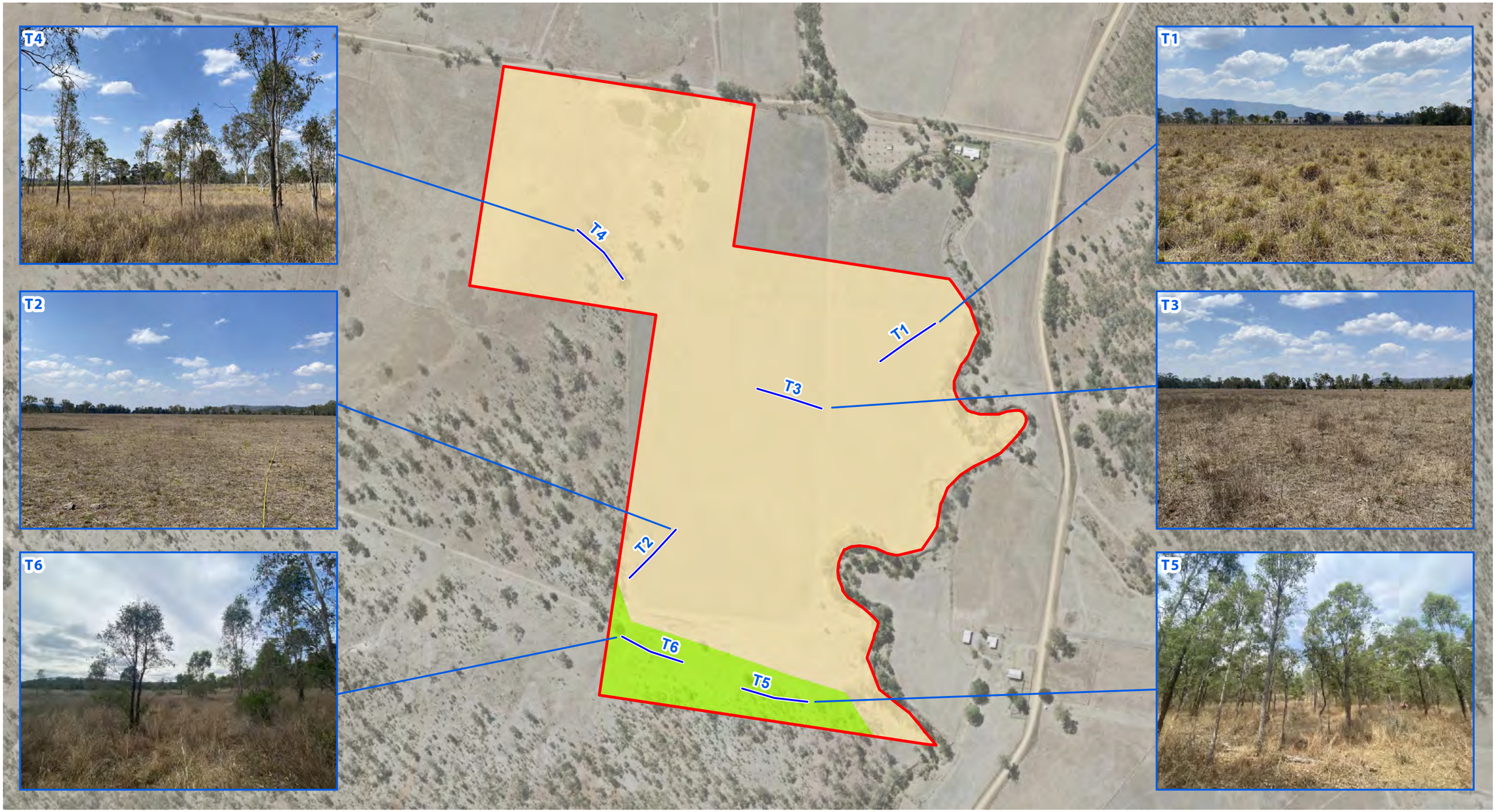
Vegetation Assessment Units (Offset Area)

- AU-1: Non-Remnant Vegetation [37.9 ha]
- AU-2: Regrowth Vegetation [3.4 ha]

Vegetation Assessment Units (Poultry Shed Buffers)

- **AU-1:** Non-Remnant Vegetation
- **AU-2:** Regrowth Vegetation
- **AU-3:** Remnant Vegetation

10. Offset Area Assessment Units



Montauban Environmental Offsets

References:
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Project: Rosevale Offset Area 3

Date: 23/10/2025

10559 E 10 OMP_P Offset Site Assessment Units A

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1:5,500

0 50 100 150 m

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

Legend

Offset Area

MHQA Transects

Assessment Units

Assessment Unit 1:
Non-Remnant RE 12.3.3
[37.9 ha]

Assessment Unit 2:
Regrowth RE 12.8.17/12.8.14
[3.4 ha]

KOALA HABITAT - MODIFIED HABITAT QUALITY ASSESSMENT TOOL

The ROA 3 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 MNES.

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

The Modified Habitat Quality Assessment (MHQA) combines the three (3) core indicators into two (2) (site condition and site context) with each Site Condition being weighted 30% of the final score and Site Context being weighted 30% of the final score. The balance of the weighting (40 %) has been attributed to the third indicator which is independent of the traditional habitat quality assessment, being species stocking rate. The species stocking rate has been added to the MHQA to better incorporate MNES, and for the purpose of this project, the vulnerable-listed Koala MNES. The following section details the methodology utilised to assess the site condition, site context and species stocking rate under the MHQA.

A total of six (6) MHQA transects were completed across the offset area within the delineated assessment units (Plan 10).

Site Condition (30 %)

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

The site condition assessment under the MHQA is assessed using fifteen (15) condition characteristics. Each condition characteristic and the relevant scoring and benchmark percentage is provided in Table 14.

Table 14: Koala site condition scoring attributes (BioCondition Manual)

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

Site condition attribute	*Scoring and benchmark percentage*				
(4) Native plant species richness – grasses	Benchmark	<25%	≥25-90%		≥90%
(5) Native plant species richness – forbs	Score	0	2.5		5
	Benchmark	<25%	≥25-90%		≥90%
(6) Tree canopy height	Score	0	3		5
	Benchmark	<25%	≥25-70%		≥70%
(7) Tree canopy cover	Score	0	2	3	5
	Benchmark	<10%	≥10%-<50%	≥200%	≥50-200%
(8) Shrub canopy cover	Score	0	3		5
	Benchmark	<10%	≥10%-<50% or ≥200%		≥50-<200%
(9) Native perennial grass cover	Score	0	1	3	5
	Benchmark	<10%	≥10-50%	≥50-90%	≥90%
(10) Organic litter	Score	0	3		5
	Benchmark	<10%	≥10%-50% or ≥200%		≥50-<200%
(11) Large trees	Score	0	5	10	15
	Benchmark	0%	0-50%	≥50-100%	≥100%
(12) Coarse woody debris	Score	0	2		5
	Benchmark	<10%	<50% or ≥200%		≥50% or <200%
(13) Non-native plant cover	Score	0	3	5	10
	Benchmark	>50%	≥25-50%	≥5-25%	<5%
(14) Quality and availability of food and foraging habitat	Score	1	5		10
	Benchmark	SC1-13 attributes = <27/80 (<33% of benchmark)	SC1-13 attributes = >27/80-<54/80 (33% of benchmark)		SC1-13 attributes = >54/80
(15) Quality and availability of shelter	Score	1	5		10
	Benchmark	SC1-13 attributes = <27/80 (<33% of benchmark)	SC1-13 attributes = >27/80-<54/80 (33% of benchmark)		SC1-13 attributes = >54/80 (≥66% of benchmark)

Assessment methodology of the above condition characteristics mostly do not differ from the traditional terrestrial habitat quality assessment. 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 (SC) attributes where their score is utilised as follows; <27/80 scores 1 (<33% of benchmark), between 27/80 and 54/80 scores 5 (33% of benchmark) and above 54/80 scores 10 (≥66% of benchmark).

Site Context (30 %)

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

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

- Size of patch – Measured as the area of vegetation in which the assessment unit(s) is contained, and add on all other directly connecting areas of koala habitat. The calculation of the area of the patch size uses the method outlined in the BioCondition assessment manual v2.2 that considers the patch to be areas connected by corridors greater than 200 m wide within a 1 km radius of the site. This methodology includes use of a "segmentation" process that removes areas connected to the assessment area by narrow corridors (Plan 11).
- Connectedness – Relates to the capacity that the species have to disperse through the landscape. This attribute is calculated using GIS by measuring the length koala habitat along the boundary of the site, calculated as a percentage (Plan 11).
- Context – The context score is calculated by GIS to quantify the amount of vegetation immediately surrounding the assessment site. It is measured as the percentage of koala habitat within a 1 km radius of the site (Plan 11)
- Ecological corridors – This attribute is as per the methods of the Guide to determining terrestrial habitat quality V1.2 and is used to determine if a site is located within or shares a boundary with an ecological corridor that facilitates long term ecosystem function by connecting large patches of remnant vegetation with sufficient tract size (corridor width in relation to the fragmentation of the landscape) (EHP 2014). These corridors support the habitat of MNES by providing opportunity for long term dispersal of habitat species following landscape level changes in climate. Although the ecological corridors allow for the dispersal of MNES themselves, for example, Koala, this is not their primary function when assessing the attribute. An 'ecological corridor' is represented as any 'Riparian' or 'Terrestrial' feature within the 'CORR_TYPE' attribute table of the 'Queensland biodiversity and vegetation offsets special features' map. The mapping can also be viewed on Queensland Globe in the 'Statewide Biodiversity Corridors' layer (Figure 5 and Figure 6).
- Role of site location to species overall population in the state – This attribute is based on the observed role of the site in relation to the overall population of the species. The scoring table considers the species' use of the site – such as whether it is used for feeding and/or nesting and the effect that damage to or removal of the site would have to the likelihood of the species' overall population survival.
- Threats to the species – This attribute identifies the presence and severity of threatening processes observed at or adjacent to the site which may include clearing associated with development, creation of a barrier to movement, introduction or spread of disease or pathogens, risk of high-intensity fires, degradation of habitat from hydrological change and introducing or increasing mortality attributed to vehicle strike or dog attacks. The highest threat level is given to a site if it isolated from other Koala habitat, or if major roads without exclusion measures, or residential encroachment is within 1500 m of the site boundary.
- Species mobility capacity – Scored based on the presence and severity of factors that would contribute to a reduction in the mobility of the species such as barriers that would result in a long-term reduction

in genetic fitness or access to important resources. Examples of mobility limited factors include roads, large, cleared areas and weed infestations. Under the Habitat Quality Guideline, this is measured in terms of a percentage reduction

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.

Contiguous habitat values suitable to the Koala within the landscape was determined using the combination of the Unsupervised Classification tool within ESRI's ArcGIS software and the most recently available aerial photograph from Nearmap.com. The Unsupervised Classification tool can 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 areas 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 Koala habitat.

Scoring attributes extracted from the Habitat Quality Guideline are provided in Table 15.

Table 15: Koala site context scoring attributes

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

Site context attribute	Scoring and benchmark percentage			
	High threat level	Moderate threat level	Low threat level	
Species mobility capacity	1	4	7	10
	Severely restricted (76-100% reduction)	High restricted (51-75% reduction)	Moderately restricted (26-50% reduction)	Minor restriction (0-25% reduction)

Species Stocking Rate (40 %)

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

- Species presence on or adjacent to the site – whether or not evidence of koala has been recorded within or adjoining the site. Evidence may be direct in the form of observation of koalas, or indirect via the presence of scats.
- Species usage of the site (habitat type and evidenced usage) – the type of habitat includes vegetation structure such as whether it contains remnant, regrowth or non-remnant vegetation values, and evidenced usage is the confirmed presence or use of the species within the habitat. Both factors are used to inform the species usage of the site. Depending on the level of variability in vegetation and usage patterns across the site, this characteristic may be scored differently for assessment units.
- Approximate density of the species on the site – measured through the use of Spot Assessment Technique (SAT) (Phillips *et al.* 2011) and targeted searches with a high probability of detection, including UAV drone surveys. The combination of methods produces a higher reliability of data when extrapolating koala density. The SAT method is an industry recognised technique for identifying presence/absence of koala and measuring activity. SAT survey results are interpreted using the broad population categories provided in the Australian Koala Foundation Koala activity level classification table to infer an activity level or approximate density. These categories being 'East Coast (low)', 'East Coast (med-high)' and 'Western (med-high)' are shown in Table 16. Depending on the population category applied, koala activity is described as 'low', 'moderate', or 'high'.
- Role/importance of species population on site – the extent to which the site is considered a key source population for breeding, dispersal, is necessary for maintaining genetic diversity or near the limit of the species range.

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. 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.

While the SAT survey methodology is considered an informative technique when estimating SEQ Koala activity levels, there are a number of limitations. The abundance and density of Koalas cannot be directly determined through this method. However, fixed amount of sampling gives fixed proportion of population, and the value of index usually increases with population density. Additionally, stable populations have higher rate of faecal pellet deposition (Lunney *et al.* 1998), leading to bias occupational rate where multiple SAT sites can be occupied by only the one animal (Phillips and Hopkins 2008).

For subjective criteria where it is unclear whether a particular attribute score is achieved, the precautionary approach is applied to favour the higher score. Table 17 outlines the attributes utilised to assess species stocking rate.

Table 16: Koala Activity Level Classification (Phillips and Callaghan 2011)

Activity	East Coast (low)	East Coast (med-high)	Western (med-high)
Low	<3.33%	<22.5%	<35.8
Moderate	3.33-12.6%	22.5-32.8%	35.8-46.7
High	>12.6%	>32.8	>46.7

Table 17: Koala Species Stocking Rate Scoring

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

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

Scoring Weight Justification

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

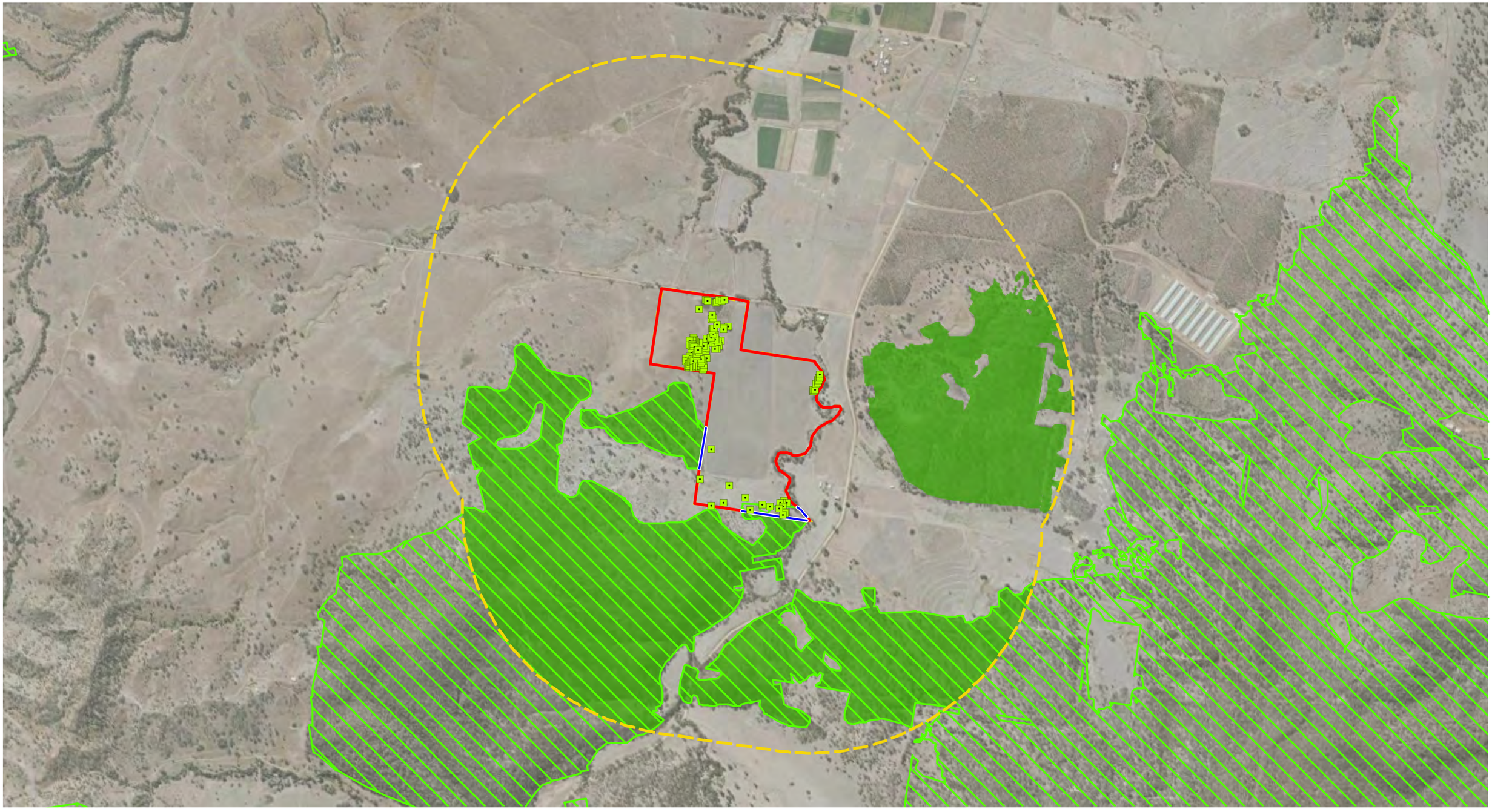
Species Stocking Rate was assigned the highest weighting as it is considered the greatest determinant of site suitability for the Koala. Species Stocking Rate is an important component when assessing the overall habitat quality of a site as it indicates species usage.

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 the suitability of the offset area in terms of its capacity to support the Koala.

11. Koala Context Assessment



Montauban Environmental Offsets

1:16,000

0 100 200 300 m

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
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Project: Rosevale Offset Area 3

Date: 28/10/2025

10559 E 11 OMP_P Koala Context Assessment A

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Legend

- Offset Area
- 1km buffer
- Percentage of Offset Area boundary length supporting a koala critical habitat connection off and on site - 14.4%
- Percentage of Koala Critical habitat within 1km of Offset Area (36%)
- Size of Koala critical habitat patch >200m corridor connectivity (>500 ha)

GPS Tree Plot

- Non-juvenile Koala Habitat Tree
- Other Native Tree

The habitat quality scores for each AU were determined using a combination of Site Condition, Site Context and Species Stocking Rate technical data and scoring. 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.

Refer to **Table 18** for a summary of the results. The detailed results are presented in **Table 20 / Table 20** for AU1 and **Table 21 / Table 22** for AU2. The complete raw data for site condition is provided at **Appendix D**.

Table 18: MHQA Final Weighted Scores Summary – Koala

MHQA Final Weighting	AU1	AU2
Site Condition (/3)	0.74	1.44
Site Context (/3)	1.88	2.04
Species Stocking Rate (/4)	0.86	2.29
AU Score	**3.47**	**5.76**

Site Condition

The AUs defined on-site reflect the differing states of the vegetation on-site (**Plan 10**). AU2 achieved the highest score for site condition—**1.44 out of 3.** The scores in this area relative to the other assessment unit was evident from the higher species richness, tree canopy height and tree canopy cover. Comparatively, AU1 is substantially more disturbed, achieving a site condition score of **0.74 out of 3**.

Site Context

- *Size of patch* – The size of patch attribute was calculated using GIS and determined the offset area to be part of a patch size of larger than 1000 ha. This achieved a score of **10 out of 10** (>200 ha Koala Habitat as per the *Queensland BioCondition Assessment* methodology) (**Plan 11**).
- *Connectedness* – Connectedness was calculated using GIS, with the percentage of offset area boundary length supporting a Koala critical habitat connection off and on-site calculated at 14.4 %, and consequently this attribute scored a **2 out of 5** as per the *Queensland BioCondition Assessment* methodology (**Plan 11**).
- *Context* – Existing critical Koala habitat within a 1 km buffer of the site was calculated at 36 %, and therefore the context attribute achieved a score of **4 out of 5** as per the *Queensland BioCondition Assessment* methodology (**Plan 11**).
- *Ecological Corridors* – A score of **6 out of 6** was given to the Ecological Corridors as the site partially located within a riparian corridor (**Figure 5**).
- *Role of site location to species overall population in the State* – This attribute achieved a score of **5 out of 5** noting the site's importance for Koala.
- *Threats to the species* – A score of **7 out of 15** was attributed recognising a moderate level of threats, supported by the existing threats such as habitat clearing within agricultural land use areas and the presence of wild and domestic dogs on the property.
- *Species mobility capacity* – The Koala is considered a relatively immobile species, requiring land for movement, and covering relatively small distances on-ground compared to other highly mobile fauna. A score of **1 out of 10** was assigned to AU1 noting the predominant absence of trees required for

mobility and a score of 4 out of 10 was assigned to AU2 noting the sparse presence of regrowth assisting in mobility.

Species Stocking Rate

Evidence of Koala was recorded within the AU2 only through the detection of scats during SAT surveys. The presence of scats demonstrate that Koalas utilise the landscape and that the offset area has the capacity to support ecological gain for the Koala.

The species stocking rate for Koala scored 15 out of 40 for AU1 (Table 20) and 40 out of 70 for AU2 (Table 22) reflecting the varying capacity of the resources within the offset area to support Koala. Further details on the assessment are provided below:

- *Presence detected on or adjacent to site* – Evidence in the form of scats was observed within the offset area therefore this attribute was assigned a score of 10 out of 10 for the site scale.
- *Species usage of the site* – Due to the absence of foraging and breeding habitat and absence of evidence of use, AU1 was scored a 0 out of 15. AU2 was assigned a score of 15 out of 15 to reflect breeding habitat as confirmed through evidenced usage and presence of advanced foraging values.
- *Approximate density* – AU1 was assigned a 0 out of 10 noting the absence of evidence or use while AU2 achieved a score of 10 out of 30 due to the presence of scats confirming 'low density.' It is considered that the variability in the landscape of the offset area, Koalas utilised the more heavily treed and connected habitat areas. It is anticipated that the capacity of these non-remnant assessment units to support Koala will improve with weed management and active regeneration.
- *Role/importance of species population on-site* – Using the precautionary principle, the offset area is considered a key source for population for dispersal therefore was scored a 5 out of 15 for all assessment units.

Table 19: Koala MHQA – Assessment Unit 1 ROA 3

Assessment Unit - Regional Ecosystem	AU 1 – Non-remnant Paddock RE12.3.3							
	RE12.3.3 Benchmark	Transect 1	Transect 2	Transect 3	Transect 4	Average of Transect(s)	% Benchmark	Score
SITE CONDITION								
Recruitment of woody perennial species in EDL	100	0	0	0	66.67	16.6675	16.6675	0
Native plant species richness - trees	5	0	2	0	3	1.25	25.00	2.5
Native plant species richness - shrubs	5	1	0	0	0	0.25	5.00	0
Native plant species richness - grasses	9	2	3	2	5	3	33.33	2.5
Native plant species richness - forbs	25	0	0	0	5	1.25	5.00	0
Tree canopy height (Canopy)*	25	0	4	0	26	7.5	30.00	3
Tree canopy height (Sub-canopy)*	9	0	0	4	7	2.75	30.56	3
*Average tree canopy height								3
Tree canopy cover (Canopy)**	40	0	0	0	38	9.5	23.75	2
Tree canopy cover (Sub-canopy)**	8	0	10.9	0	14.7	6.4	80.00	5
**Average tree canopy cover								3.5
Shrub canopy cover	4	1.1	1.6	0.6	5	2.075	51.88	5

Assessment Unit - Regional Ecosystem	AU 1 – Non-remnant Paddock RE12.3.3							
	RE12.3.3 Benchmark	Transect 1	Transect 2	Transect 3	Transect 4	Average of Transect(s)	% Benchmark	Score
Native grass cover*	52	4	53	4	4	16.25	31.25	1
Organic litter*	20	0	0	0	0	0	0.00	0
Large trees (euc plus non-euc) (per ha)	14	0	0	0	8	2	14.29	5
Coarse woody debris (per ha)	588	0	0	0	85	21.25	3.61	0
Non-native plant cover	0	95	75	85	25	70	70.00	0
Quality and availability of food and foraging habitat	NA	1	1	1	1	1	-	1
Quality and availability of shelter	NA	1	1	1	1	1	-	1
							Site Condition Score (/100)	24.5
							Overall Site Condition Score - out of 3	0.74
SITE CONTEXT								
Size of patch	10	10	10	10	10	10		10
Connectedness	5	2	2	2	2	2		2
Context	5	4	4	4	4	4		4

Assessment Unit - Regional Ecosystem	AU 1 – Non-remnant Paddock RE12.3.3							
	RE12.3.3 Benchmark	Transect 1	Transect 2	Transect 3	Transect 4	Average of Transect(s)	% Benchmark	Score
Ecological Corridors	6	6	6	6	6	6		6
Role of site location to species overall population in the state	5	5	5	5	5	5		5
Threats to the species	15	7	7	7	7	7		7
Species mobility capacity	10	1	1	1	1	1		1
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	15	15	15	15	15		15
Species Stocking Rate Score (/70)								15.00
Overall Species Stocking Rate Score - out of 4								0.86
Overall Assessment Unit Score								3.47

Table 20: Koala MHQA – Assessment Unit 1 Species Stocking Rate ROA 3

Species Stocking Rate attributes	
Presence detected on or adjacent to site (neighbouring property with connecting habitat)	10/10 (use on site)
Species usage of the site (habitat type and evidenced usage)	0/15 (not habitat)
Approximate density (per ha)	0/30 (no evidence in AU)
Role/importance of the species population on site*	5/15 (key source population for dispersal)
Total Species Stocking Rate Score	**15/70**
Species Stocking Rate Score – out of 4	**0.86**

*Species Stocking Rate supplementary table attributes	
Key source population for breeding	0/10
Key source population for dispersal	5/5 (precautionary)
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

Table 21: Koala MHQA – Assessment Unit 2 ROA 3

Assessment Unit - Regional Ecosystem	AU 2 – Sparse Regrowth RE12.8.17/12.8.14					
	RE12.8.17 Benchmark	Transect 1	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	7	5	3	4	57.14	2.5
Native plant species richness - shrubs	5	4	3	3.5	70.00	2.5
Native plant species richness - grasses	12	4	4	4	33.33	2.5
Native plant species richness - forbs	27	6	3	4.5	16.67	0
Tree canopy height (Canopy)*	19	19	0	9.5	50.00	3
Tree canopy height (Sub-canopy)*	10	8	9	8.5	85.00	5
					*Average tree canopy height	4
Tree canopy cover (Canopy)**	48	8.5	0	4.25	8.85	0
Tree canopy cover (Sub-canopy)**	20	38.6	23	30.8	154.00	5
					**Average tree canopy cover	2.5
Shrub canopy cover	5	2.2	1.3	1.75	35.00	3
Native grass cover*	32	42	47	44.5	139.06	5

Assessment Unit - Regional Ecosystem	AU 2 – Sparse Regrowth RE12.8.17/12.8.14					
	RE12.8.17 Benchmark	Transect 1	Transect 3	Average of Transect(s)	% Benchmark	Score
Organic litter*	21	16	5	10.5	50.00	3
Large trees (euc plus non-euc) (per ha)	24	4	0	2	8.33	5
Coarse woody debris (per ha)	234	177	167	172	73.50	5
Non-native plant cover	0	55	55	55	85.00	0
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)	48
					Overall Site Condition Score - out of 3	1.44
SITE CONTEXT						
Size of patch	10	10	10	10		10
Connectedness	5	2	2	2		2
Context	5	4	4	4		4
Ecological Corridors	6	6	6	6		6

Assessment Unit - Regional Ecosystem	AU 2 – Sparse Regrowth RE12.8.17/12.8.14					
	RE12.8.17 Benchmark	Transect 1	Transect 3	Average of Transect(s)	% Benchmark	Score
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	4	4	4		4
Site Context Score (/56)						38
Overall Site Context Score - out of 3						2.04
SPECIES STOCKING RATE						
Koala Stocking Rate (utilising SSR & SSR Supplementary Table(s)	70	40	40	40		40
Species Stocking Rate Score (/70)						40.00
Overall Species Stocking Rate Score - out of 4						2.29
Overall Assessment Unit Score						5.76

Table 22: Koala MHQA – Assessment Unit 2 Species Stocking Rate ROA 3

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

*Species Stocking Rate supplementary table attributes	
Key source population for breeding	0/10
Key source population for dispersal	5/5 (precautionary)
Necessary for maintaining genetic diversity	0/15
Near the limit of the species range	0/15

GREY-HEADED FLYING-FOX FORAGING HABITAT ASSESSMENT TOOL

The offset area has been assessed using a GHFF Foraging Habitat Assessment (GHFF FHA) tool developed by the Saunders Havill Group (2019) 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 (2) (site condition and site context) with site condition being weighted with 40 % and site context weighted at 30 % of the final score. The balance of the weighting (30 %) has been attributed to the third indicator which is independent of the traditional habitat quality assessment, being species stocking rate. The species stocking rate assessment incorporated in the GHFF FHA tool is focussed on 'foraging habitat' for GHFF rather than GHFF stocking rates (presence/absence of the species). This assessment of 'foraging habitat' for species stocking rate has been incorporated in the GHFF FHA tool as Grey-headed Flying-fox roosting camp or species presence was not observed on-site, however, suitable foraging habitat for the species was evident. Therefore, the density of foraging habitat available on-site is considered an appropriate assessment benchmark for species stocking rate.

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

Site Condition (40 %)

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

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

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

Assessment methodology of the above condition characteristics is outlined below:

- Vegetation condition – This condition characteristic is assessed using the Queensland *Vegetation Management Act 1999* vegetation community status definition, being Category B (remnant), Category C (high-value regrowth) and Category X (non-remnant). This characteristic is scored from a desktop mapping perspective and verified on-ground during assessment. Refer to Table 23.
- Species richness (canopy trees) – This condition characteristic is assessed using a 100 m X 20 m plot following the contour of the land when possible. Within the plot, all canopy tree and subcanopy tree specimens are recorded. It should be noted that non-GHFF foraging species are also documented. Refer to Table 24.
- Flower scores (average) – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within *Ranking the feeding habitat of Grey-headed flying foxes for conservation management* (Eby and Law 2008) and the *National Recovery Plan for the Grey-headed Flying-fox* (DAWE, 2021) and determining the flower score of the recorded canopy species. The individual score for each flowering GHFF foraging tree is then divided by the number of species recorded (GHFF foraging and non-GHFF foraging trees) to produce an average. The benchmark values for this condition characteristic have been derived from the findings published by Eby and Law (2008) (Ranking the feeding habitat of Grey-headed flying foxes for conservation management). Refer to Table 25.
- Timing of biological shortages – This condition characteristic is assessed by analysing and cross referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within Ranking the feeding habitat of Grey-headed flying foxes for conservation management (Eby and Law 2008) and the *National Recovery Plan for the Grey-headed flying-fox* (DAWE, 2021) and determining the ability of the canopy species in the vegetation community to produce foraging habitat during biological shortages (food shortages, pregnancy and birthing, lactation, mating and conception, migration paths and fruit industries). It should be noted that this condition characteristic is weighted and 'food shortages' has been weighted heavier than the balance of the characteristics which are equal, as 'food shortages' is recognised as a major issue. Refer to Table 26.
- Quality of foraging habitat – This condition characteristic is assessed by analysing and cross-referencing the species recorded in the 'species richness (canopy trees)' characteristic with the published literature, specifically the information within Ranking the feeding habitat of Grey-headed flying foxes for conservation management (Eby and Law 2008) and the *National Recovery Plan for the Grey-headed flying-fox* (DAWE, 2021) and determining which canopy species recorded contain a flower score greater than 0.65 wt p*r and is recognised as a significant food plant by Eby and Law (2008). It should be noted that species recorded that are not prescribed a value by Eby and Law (2008) but are recognised as GHFF foraging trees, have been given an average weighted value of related species or, in the case of *Eucalyptus crebra* (Narrow-leaved Ironbark) been prescribed a value of 0.65 and classified as a significant food plant given its importance as a winter flowering species as acknowledged in the *National Recovery Plan for the Grey-headed Flying-fox* (DAWE, 2021). Refer to Table 27.
- Non-native plant cover – This condition characteristic is assessed using a 100 m X 20 m plot following the contour of the land when possible. All non-native plant cover was assessed by estimating the cover of exotic species over the 100 m X 20 m plot. Refer to Table 28.

It should be noted that for on-ground assessment purposes, the 100 m X 20 m plot utilised for the GHFF FHA overlaps with the on-ground condition characteristics of the Koala MHQA. Refer to the **Figure 11** below for location of GHFF FHA within the MHQA Plot.

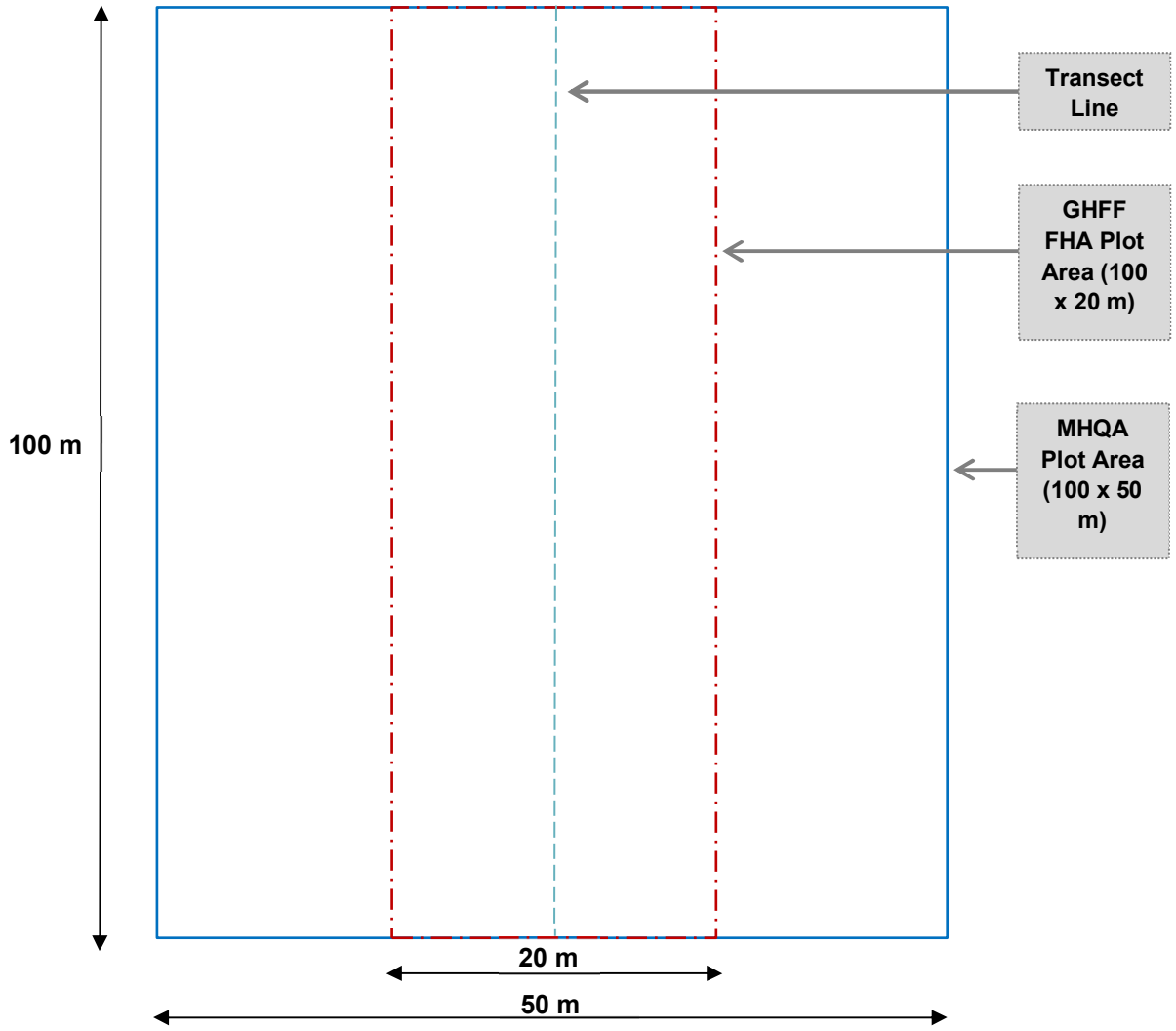


Figure 11: MHQA and GHFF FHA Plot Location Diagram

Site Context (30 %)

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

- Size of patch (**Plan 12**);
- Connectedness (active GHFF roost camps in a 20 km radius) (**Plan 12**);
- Context (percentage of GHFF foraging habitat in a 20 km radius) (**Plan 12**);
- Ecological corridors (refer **Plan 12**);

- 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) (Plan 12); and
- Threats to the species.

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

- Size of patch – This context characteristic is assessed using a modified version of the traditional habitat quality assessment with the directly connected patch of GHFF foraging habitat to site measured. This context characteristic is measured using GIS. The benchmark values for this context characteristic are those used in the traditional habitat quality assessment (Table 29).
- Connectedness – This context characteristic is assessed by analysing the number of active GHFF roost camps (over the past year of monitoring (2023-2024)) within a 20 km radius of the site. For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government) (Table 30).
- Context – This context characteristic is assessed using a modified version of the traditional habitat quality assessment with the percentage of GHFF foraging habitat within a twenty (20) kilometre buffer of the site measured. This context characteristic is measured using GIS (Table 31).
- 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 (Table 32).
- 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 (Table 33).
- Role of site location to species overall population in the state (active GHFF national flying-fox monitoring viewer 'level 3' roost camps in a 20 km radius) – This context characteristic is assessed by analysing the number of active GHFF roost camps level 3 or greater (over the past year of monitoring (2023-2024)) within a 20 km radius of the site. For consistency purposes this assessment is to utilise the data provided on the national flying-fox monitoring viewer (Australian Government) (Table 34).

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.

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). The methodology detailed in Neldner et al. (2019) uses a plot area of 50 X 10 m. For the purposes of this assessment, the area was modified to 100 X 20 m to align with the MHQA plot, however, the actual count assessment method remains the same.

This methodology involves assigning the strata for canopy (T1) and subcanopy (T2) and then counting the number of individual tree specimens within the 100 m X 20 m plot. A tree that branches into two or more stems above 30 cm above the ground is counted as one individual. The stem density of canopy species recorded within

the 0.2 ha plot is multiplied by five (5) to produce a stem density per ha. This number is then compared to the benchmark stem density per ha based on the sum of the T1 and T2 stem density taken from the relevant regional ecosystem technical description as per the *Technical Descriptions of Regional Ecosystems of Southeast Queensland* (Ryan 2019). Refer to Table 35 for benchmark scoring values for species stocking rate.

Table 23: GHFF FHA Vegetation Condition Scoring

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

Table 24: GHFF FHA Species Richness Scoring

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

Table 25: 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 26: 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 27: 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 28: 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 29: 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 30: 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 31: 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 32: GHFF FHA Ecological Corridors Scoring

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

Table 33: GHFF FHA Threats to Species Scoring

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

Table 34: GHFF FHA Role of Site Location to Species Overall Population in the State Scoring

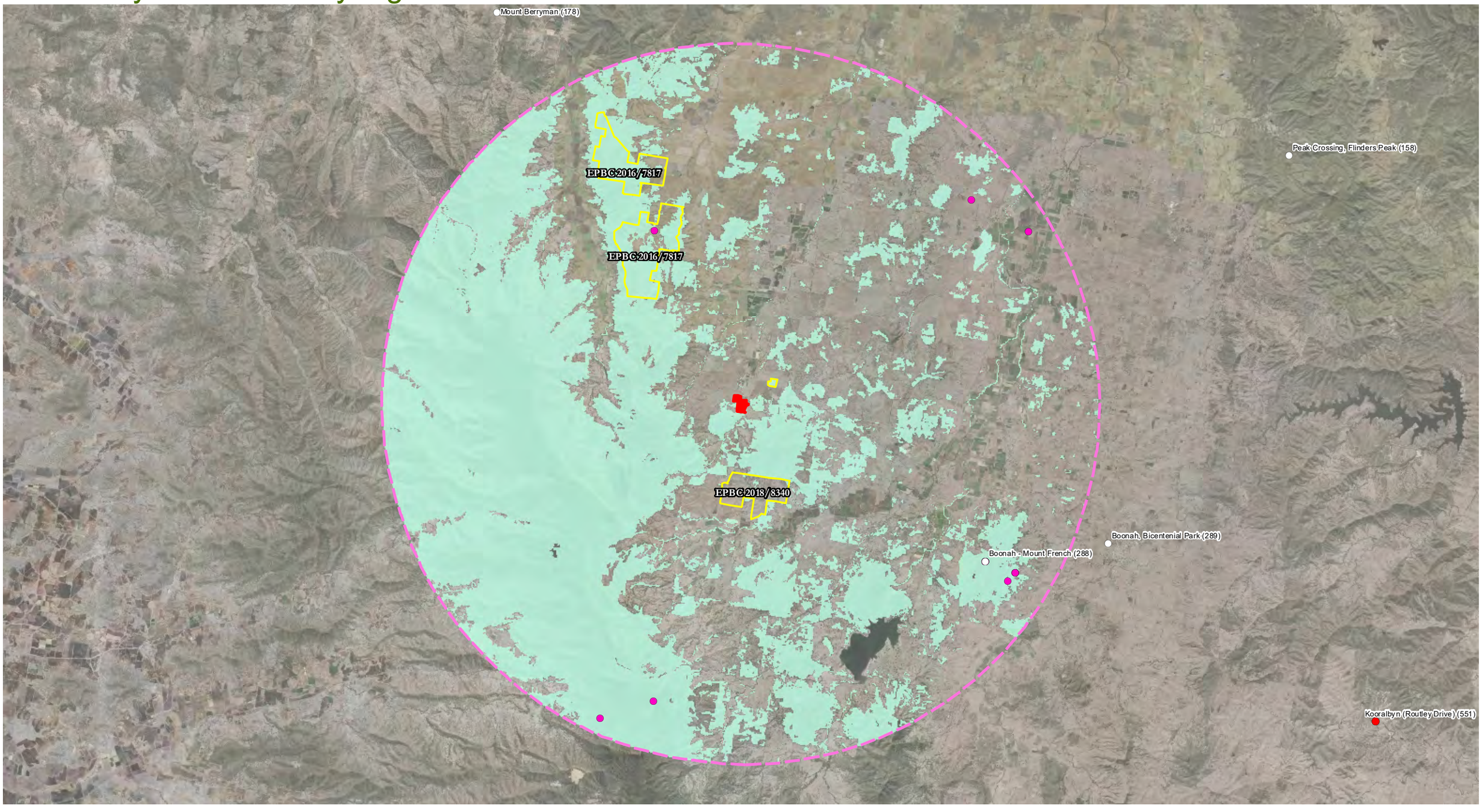
Score	Description
1	1 – 2 active level 3 Grey-headed Flying-fox camp within a 20 km radius
6	2 – 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius
10	> 4 active level 3 Grey-headed Flying-fox camp within a 20 km radius

Table 35: GHFF Species Stocking Rate Scoring

	Stem density per hectare	
Score	**RE12.8.17**	**RE12.3.3**
2	0-73	0-40
4	74-314	41-80
6	315-532	81-120
8	533-568	121-160
10	569-592	161-200
8	593-628	201-240
6	629-846	241-280

4	847-1088	281-320
2	>1089	321-360

12. Grey-headed Flying-fox Context Assessment



Montauban Environmental Offsets

1:210,000

0 1 2 3 4 5 km

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
© State of Queensland, 2022

Project: Rosevale Offset Area 3

Date: 23/10/2025

10559 E 12 OMP_P GHFF Context Assessment A

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Legend

- Offset Area
- Existing Approved Grey-headed Flying-fox Offset
- Offset Area 20km Buffer
- Grey-headed Flying-fox records within 20km of offset area - 25
- Potential and Known Grey-headed Flying-fox Foraging Habitat Within 20km of Offset Area [46%]

National Flying-fox monitoring data (Fed Gov. 2024.)

- Grey-headed Flying-fox roost inactive within recent surveys [1 within 20km of offset area]
- Grey-headed Flying-fox roost active within recent surveys
- Grey-headed Flying-fox roost active within recent surveys with a population level of 3 or above
- Nationally significant Grey-headed Flying-fox roost active within recent surveys
- Nationally significant Grey-headed Flying-fox roost active within recent surveys with a population level of 3 or above

Site Condition (40%)

The baseline site condition characteristics for GHFF are summarised in Table 36.

Site Context (30%)

The baseline site context characteristics for GHFF are shown on Plan 12 with results summarised in Table 36.

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

Species Stocking Rate (30%)

The baseline species stocking rate scores is determined by the stem density of GHFF foraging species. The offset area species stocking rate results for GHFF are summarised in Table 36.

Table 36: GHFF FHA – Assessment Summary

		Maximum Score	Assessment Unit – Regional Ecosystem			
			AU 1 Non-remnant Paddock RE 12.3.3		AU 2 Sparse Regrowth RE 12.8.17	
Site Condition (40%)	Vegetation Condition	20	5	AU 1 is mapped as Category X	5	AU2 is mapped as Category X
	Species Richness	20	5	T1 – 0 GHFF species T2 – 2 GHFF species T3 – 0 GHFF species T4 – 3 GHFF species Average – 1.25 GHFF species	10	T5 – 5 GHFF species T6 – 4 GHFF species Average – 4.5 GHFF species
	Flower Score	10	2	T1 – 0 T2 – 0.565 T3 – 0 T4 – 0.383 Average – 0.24	8	T5 – 0.606 T6 – 0.635 Average – 0.62
	Timing of Biological Shortages	10	4.625	T1 – 0 T2 – 8.5 T3 – 0 T4 – 10 Average – 4.625	10	T5 – 10 T6 – 10 Average – 10
	Quality of Foraging Habitat	20	5	T1 – 0 species T2 – 1 species T3 – 0 species T4 – 1 species Average – 0.5 species	5	T5 – 3 species T6 – 3 species Average – 3 species
	Non-native Plant cover	20	1	T1 – 95% T4 – 75% T5 – 85% T6 – 25% Average – 70%	1	T2 – 55% T3 – 55% Average – 55%

		Maximum Score	Assessment Unit – Regional Ecosystem			
			AU 1 Non-remnant Paddock RE 12.3.3		AU 2 Sparse Regrowth RE 12.8.17	
	Site Condition Score	**100**	**22.625**		**39**	
	Site Condition Score – out of 4	**4.00**	**0.91**		**1.56**	
Site Context (30%)	Size of Patch	**10**	**10**	Patch size is greater than 200 ha	**10**	Patch size is greater than 200 ha
	Connectedness	**10**	**0**	0 active camps within 20 km	**0**	0 active camps within 20 km
	Context	**10**	**6**	46%	**6**	46%
	Ecological Corridors	**10**	**10**	Partially within Statewide riparian corridor	**10**	Partially within Statewide riparian corridor
	Roles of the site location to the species overall population in the state	**10**	**0**	0 active level 3 GHFF camps within a 20 km radius	**0**	0 active level 3 GHFF camps within a 20 km radius
	Threats to species	**10**	**5**	A low level of threats is prescribed noting the presence of barbed wire.	**5**	A low level of threats is prescribed noting the presence of barbed wire.

		Maximum Score	Assessment Unit – Regional Ecosystem			
			AU 1 Non-remnant Paddock RE 12.3.3		AU 2 Sparse Regrowth RE 12.8.17	
	Site Context Score	**60**	**31**		**31**	
	Site Context Score – out of 3	**3.00**	**1.55**		**1.55**	
Species Stocking Rate (30%)	GHFF Foraging Tree Density per hectare	-	1	T1 – 1 T2 – 1 T3 – 1 T4 – 1 Average – 1	5	T5 – 6 T6 – 4 Average – 5
	Species Stocking Rate Score	**10**	**1**		**1**	
	Species Stocking Rate – out of 3	**3.00**	**0.30**		**0.30**	
Total			**2.76**		**3.41**	

SWIFT PARROT FORAGING HABITAT ASSESSMENT

To quantify baseline habitat and future value for the swift parrot, a feature-based assessment method was utilised. The method involves calculating the number of individual habitat features located within the offset area and the number that will be reinstated as part of the offset.

A habitat feature for the Swift Parrot is defined as a non-juvenile tree (*i.e.,* ≥100 mm DBH) which is a preferred foraging tree species identified under the *National Recovery Plan for the Swift Parrot* (DCCEEW, 2024). Listed preferred foraging tree species include:

- *Eucalyptus leucoxylon* (yellow gum)
- *Eucalyptus tricarpa* (red ironbark)
- *Eucalyptus sideroxylon* (mugga ironbark)
- *Eucalyptus macrocarpa* (grey box)
- *Eucalyptus albens* (white box)
- *Eucalyptus melliodora* (yellow box)
- *Eucalyptus robusta* (swamp mahogany)
- *Eucalyptus tereticornis* (forest red gum)
- *Eucalyptus pilularis* (blackbutt)
- *Corymbia maculata* (spotted gum). It is noted that in Queensland *Corymbia citriodora* is recognised synonymously with *Corymbia maculata*.

The methodology, comprising four (4) steps is described below with details as to how the calculations have been used to inform the OAG and rehabilitation program.

1. Baseline tree density

In order to understand the existing foraging habitat value for the Swift Parrot and the planting capacity of the offset area, the existing density of trees is required to be calculated and extrapolated.

The baseline density of all trees including preferred foraging trees was extrapolated from stem density data collected at three (3) MHQA transects (Plan 10). The two (2) AUs and associated transect site numbers are as follows:

- AU1 represents Non-remnant paddock RE12.3.3 habitat (Transects 1-4).
- AU2 represents Sparse Regrowth RE RE12.8.17/12.8.14 habitat (Transect 5-6).

Stem density data at each MHQA transect was collected in accordance with 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). The methodology detailed in Neldner et al. (2019) uses a plot area of 50 X 10 m. For the purposes of this assessment, the area was modified to 100 X 20 m to align with the MHQA plot, however, the actual count assessment method remains the same.

This methodology involves counting the number of individual non-juvenile tree specimens within each 100 m X 20 m plot (0.2 ha) including those that are listed as preferred foraging species for the Swift Parrot. A tree that branches into two or more stems 30 cm above the ground is counted as one individual.

For each AU, the number of non-juvenile trees and separately, of non-juvenile preferred foraging trees, was averaged across all habitat quality transects within the corresponding AU to produce the mean number of trees

and preferred foraging trees within a 100 X 20 m plot area (0.2 ha), the same as that used for the GHFF FHA. The average stem density of non-juvenile trees and non-juvenile preferred foraging trees recorded within the 0.2 ha plot was multiplied by five (5) to produce an estimate of the number of trees and preferred foraging trees per ha. This was then multiplied by the area of the AU to determine an estimate of non-juvenile trees and non-juvenile preferred foraging trees within each AU.

2. Planting capacity

The planting capacity or number of trees (all species) that can be supported within each AU was determined based on a planting density of 1 tree per 10 m^2 or 1000 trees per hectare for non-remnant paddock and 1 per 50 m^2 or 200 trees per hectare for sparse regrowth, proposed in accordance with the South East Queensland Ecological Restoration Framework (SEQERF) (Chenoweth EPLA, 2012). The proposed density of trees per hectare depending on the AU was multiplied by the size of the AU (in hectares) to determine the maximum planting capacity. Waterbodies were excluded from potential planting areas.

Each AU was assigned a planting palette of tree species developed based on the ground-truthed pre-clear regional ecosystem mapping and local availability of seed stock. Each planting palette comprises a mix of preferred foraging species for the Swift Parrot, other eucalypt trees and pioneer species such as *Acacia* sp. Preferred foraging tree species comprise a percentage of the total planting palette where it is suitable for the pre-clear RE and/or consistent with the local seed stock.

3. Preferred foraging species planting

The number of preferred foraging trees that will be planted per AU is calculated as the planting capacity multiplied by the percentage of preferred foraging trees. Where there are multiple species of preferred foraging tree species, these are added together to produce a total number of preferred foraging tree species to be planted.

A 90% survival rate is applied to both the on-ground planting value and the adjusted value to receive the total number of preferred and/or supporting foraging species proposed to be successfully delivered as a result of the offset. A detailed Rehabilitation Management Plan (RMP) (Appendix F) has been prepared which proposes an intensive maintenance and monitoring program to ensure the 90% survival rate is achieved. The RMP includes details on the proposed planting palettes and planting, maintenance and monitoring methodologies.

4. Net total of preferred foraging trees

The final step is to determine the net total of preferred foraging trees that will be located within each AU combining the proposed offset and baseline data. This is calculated as the total count of preferred foraging trees to be planted inclusive of a 90% survival rate, plus the baseline count of non-juvenile preferred foraging trees.

For the purposes of the OAG calculator, the net total of preferred foraging trees inclusive of a 90% survival rate of planted trees is inputted as the 'Future value with offset.'

The baseline estimate of preferred foraging species present within the ROA 3 and ROA 4 is presented below.

One (1) preferred foraging species for the Swift Parrot was recorded within ROA 3 and ROA 4 being *Eucalyptus tereticornis* (Forest Red Gum). It is estimated a total of 1,547 non-juvenile preferred foraging trees are present within ROA 3 and ROA 4 (Table 37).

Table 37: Swift Parrot baseline stem density (preferred foraging species) for ROA 3 and ROA 4

AU	AU Area (ha)	Plot #	Count of preferred foraging trees (100 X 20 m plot)	Mean number per AU (100 X 20 m plot)	Estimate per hectare	Estimate per AU
ROA 4						
1	44.9	2	0	0	0	0
1		3	0			
2	6.7	1	0	0	0	0
ROA 3						
1	86.8	1	0	6	30	1113
1		2	1			
1		3	0			
1		4	23			
2	11.0	5	31	25.5	128	434
2		6	20			
					Total site (92.1 ha)	**1547**

The results of the feature-based offset analysis utilising the combined offset planting approach for ROA 3 and ROA 4 is provided in Table 38.

Key foraging species to be reinstated within the ROA 3 and ROA 4 include *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus melliodora* (Yellow Box). Out of the total planting capacity of 83,340 trees, a total of 38,300 are proposed to be consist of preferred foraging trees for the Swift Parrot. Using a 90% survival rate, a total of 34,470 are proposed to be delivered within across the ROA 3 and ROA 4, resulting in a net total of 36,017 preferred foraging trees to protected and reinstated as a result of the offset.

A detailed Rehabilitation Management Plan is provided with this analysis to guide on-site planting works, maintenance and monitoring regime to ensure a high survival rate is achieved (Appendix F). The analysis and planting percentages of preferred foraging species is consistent with the RMP to ensure offset actions are completed as proposed in this analysis.

Table 38: Swift Parrot Feature-based Offset Analysis

Site	AU	Area (ha)	Mapped Status	On-ground Status	Planting Rate	Total Tree Plantings	Foraging Species Proportion planted			Foraging Species Count – Planted	90% survival rate
							E. melliodora	E. tereticornis	Combined		
ROA 4 (Scenic)	AU1	44.9	Cat X	Paddock	1/10 m^2	44990	0.40	0.10	0.50	22450	20205
	AU2	6.7	Cat C High	Sparse regrowth	1/50 m^2	1340	0.40	0.10	0.50	670	603
ROA 3 (Peninsula)	AU1	37.1	Cat X	Paddock	1/10 m^2	37100	0	0.40	0.40	14840	13356
	AU2	3.4	Cat X/Cat C	Sparse regrowth	1/50 m^2	680	0.40	0.10	0.50	340	306
Total						**83340**				**38300**	**34470**

REGENT HONEYEATER FORAGING HABITAT ASSESSMENT

To quantify baseline and future habitat value for the Regent Honeyeater, a feature-based assessment method was utilised. The method involves calculating the number of individual habitat features located within the offset area and the number that will be reinstated as part of the offset.

A habitat feature for the Regent Honeyeater is defined as a non-juvenile tree (*i.e.,* ≥100 mm DBH) which is a preferred foraging tree species identified under the *National Recovery Plan for the Regent Honeyeater* (DoE, 2016). Listed preferred foraging tree species include:

- *Eucalyptus leucoxylon* (yellow gum)
- *Eucalyptus sideroxylon* (mugga ironbark)
- *Eucalyptus albens* (white box)
- *Eucalyptus melliodora* (yellow box)
- *Eucalyptus robusta* (swamp mahogany)
- *Corymbia maculata* (spotted gum). It is noted that in Queensland *Corymbia citriodora* is recognised synonymously with *Corymbia maculata*.

In addition, the Recovery Plan identifies tree species with potential to provide important nectar flows at different times of year which specifically lists *Eucalyptus fibrosa* (Broad-leaved Ironbark) and *Eucalyptus eugenioides* (White Stringybark). These species were also considered in the analysis, however, were weighted at 0.75 noting their reduced importance relative to the listed preferred foraging species.

The methodology, comprising four (4) steps is described below with details as to how the calculations have been used to inform the OAG and rehabilitation program.

1. Baseline tree density

In order to understand the existing foraging habitat value for the regent honeyeater and the planting capacity of the offset area, the existing density of trees is required to be calculated and extrapolated.

The baseline density of all trees including preferred foraging trees was extrapolated from stem density data collected at three (3) MHQA transects (Plan 10). The two (2) AUs and associated transect site numbers are as follows:

- AU1 represents Non-remnant paddock RE12.3.3 habitat (Transects 1-4).
- AU2 represents Sparse Regrowth RE RE12.8.17/12.8.14 habitat (Transect 5-6).

Stem density data at each MHQA transect was collected in accordance with 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). The methodology detailed in Neldner et al. (2019) uses a plot area of 50 X 10 m. For the purposes of this assessment, the area was modified to 100 X 20 m to align with the MHQA plot, however, the actual count assessment method remains the same.

For each AU, the number of non-juvenile trees and separately, of non-juvenile preferred foraging trees, was averaged across all habitat quality transects within the corresponding AU to produce the mean number of trees and preferred foraging trees within a 100 X 20 m plot area (0.2 ha), the same as that used for the GHFF FHA. The average stem density of non-juvenile trees and non-juvenile preferred foraging trees recorded within the 0.2 ha plot was multiplied by five (5) to produce an estimate of the number of trees and preferred foraging trees

per ha. This was then multiplied by the area of the AU to determine an estimate of non-juvenile trees and non-juvenile preferred foraging trees within each AU.

2. Planting capacity

The planting capacity or number of trees (all species) that can be supported within each AU was determined based on a planting density of 1 tree per 10 m^2 or 1000 trees per hectare for non-remnant paddock and 1 per 50 m^2 or 200 trees per hectare for sparse regrowth, proposed in accordance with the SEQERF (Chenoweth EPLA, 2012). The proposed density of trees per hectare depending on the AU was multiplied by the size of the AU (in hectares) to determine the maximum planting capacity. Waterbodies were excluded from potential planting areas.

Each AU was assigned a planting palette of tree species developed based on the ground-truthed pre-clear regional ecosystem mapping and local availability of seed stock. Each planting palette comprises a of preferred and supporting foraging species for the Regent Honeyeater, other eucalypt species and pioneer species such as *Acacia* sp. Preferred and supporting foraging tree species comprise a percentage of the total planting palette where it is suitable for the pre-clear RE and/or consistent with the local seed stock.

3. Preferred foraging species planting

The number of preferred and supporting foraging trees that will be planted per AU is calculated as the planting capacity multiplied by the percentage of preferred and/or supporting foraging trees. Where there are multiple species of key or supporting foraging tree species, these are added together to produce a total number of foraging tree species to be planted.

As supporting species have a weighting of 0.75, this is applied to the total count of supporting trees to be planted to produce an adjusted estimate to trees to be planted according to their value.

A 90% survival rate is applied to both the on-ground planting value and the adjusted value to receive the total number of preferred and/or supporting foraging species proposed to be successfully delivered as a result of the offset. A detailed Rehabilitation Management Plan (Appendix F) has been prepared which proposes an intensive maintenance and monitoring program to ensure the 90% survival rate is achieved. The RMP includes details on the proposed planting palettes and planting, maintenance and monitoring methodologies.

The total of preferred and supporting foraging trees without a 0.75 weighting or survival rate being applied reflects the total number of trees that will be planted as part of the offset.

4. Net total of preferred foraging trees

The final step is to determine the net total of preferred foraging trees that will be located within each AU combining the proposed offset and baseline data. This is calculated as the total count of preferred and/or foraging trees to be planted inclusive of a 90% survival rate, plus the baseline count of non-juvenile preferred foraging trees.

For the purposes of the OAG calculator, the net total of preferred foraging trees inclusive of a 90% survival rate of planted trees is inputted as the 'Future value with offset.'

The baseline estimate of preferred foraging species present within the ROA 3 and ROA 4 is presented below.

There are currently no preferred foraging species for the Regent Honeyeater within ROA 3 and ROA 4 (Table 39).

Table 39: Regent Honeyeater baseline stem density (preferred foraging species) for ROA 3 and ROA 4

AU	AU Area (ha)	Plot #	Count of preferred foraging trees (100 X 20 m plot)	Mean number per AU (100 X 20 m plot)	Estimate per hectare	Estimate per AU
ROA 4						
1	44.9	2	0	0	0	0
1		3	0			
2	6.7	1	0	0	0	0
ROA 3						
1	86.8	1	0	0	0	0
1		2	0			
1		3	0			
1		4	0			
2	11.0	5	0	0	0	0
2		6	0			
					Total site (92.1 ha)	0

The results of the feature-based offset analysis utilising the combined offset planting approach for ROA 3 and ROA 4 is provided in Table 40. Foraging species to be reinstated within the ROA 3 and ROA 4 include preferred foraging species *Eucalyptus melliodora* (Yellow Box) and supporting foraging species *Eucalyptus eugenoides* (Thin-leaved Stringybark). Out of the total planting capacity of 46,240 trees, a total of 24,398 are proposed to be consist of foraging trees for the Regent Honeyeater. Using a 90% survival rate, a total of 21,959 are proposed to be delivered within across the ROA 3 and ROA 4 (Table 40).

A detailed Rehabilitation Management Plan is provided with this analysis to guide on-site planting works, maintenance and monitoring regime to ensure a high survival rate is achieved (Appendix F). The analysis and planting percentages of preferred foraging species is consistent with the RMP to ensure offset actions are completed as proposed in this analysis.

Noting the reduced value of supporting foraging species *E. eugenioides* for the purposes of the OAG, an adjusted value has been calculated which applies a 0.75 value to all *E. eugenioides* planted (Table 41). Applying a 90% survival rate to the adjusted total of trees, the 'future value of the offset' input for the OAG is calculated as 20,692.

Table 40: Regent Honeyeater Feature-based Offset Analysis – Planting Actual

Site	AU	Area (ha)	Mapped Status	On-ground Status	Planting Rate	Total Tree Plantings	Foraging Species Proportion planted			Foraging Species Count – Planted	90% survival rate
							E. melliodora	E. eugenioides	Combined		
ROA 4 (Scenic)	AU1	44.9	Cat X	Paddock	1/10 m^2	44990	0.40	0.12	0.52	23348	21013
	AU2	6.7	Cat C High	Sparse regrowth	1/50 m^2	1340	0.40	0.12	0.52	697	627
ROA 3 (Peninsula)	AU1	37.1	Cat X	Paddock	1/10 m^2	37100	0	0	0	0	0
	AU2	3.4	Cat X/Cat C	Sparse regrowth	1/50 m^2	680	0.40	0.12	0.52	354	318
Total						**46240**				**24398**	**21959**

Table 41: Regent Honeyeater Feature-based Offset Analysis – Adjusted for OAG

Site	AU	Area (ha)	Total Tree Plantings	Foraging Species Proportion planted			Number of E. melliodora	Number of E. eugenioides (0.75 value)	Foraging Species Count Total	90% survival rate	Future value with offset
				E. melliodora	E. eugenioides	Combined					
ROA 4 (Scenic)	AU1	44.9	44990	0.40	0.12	0.52	17960	4041	22001	19801	19801
	AU2	6.7	1340	0.40	0.12	0.52	536	121	657	591	591
ROA 3 (Peninsula)	AU1	37.1	37100	0	0	0	0	0	0	0	0
	AU2	3.4	680	0.40	0.12	0.52	272	61	333	300	300
Total			**46240**						**22991**	**20692**	**20692**

BASELINE WEED SURVEYS

INTRODUCTION

The entire Rosevale Offset Property has been surveyed for weed presence with a focus on Weeds of National Significance (WONS) due to their known adverse impacts on MNES habitat. Thirty-two (32) invasive species are identified by DCCEEW as weeds of national significance based on their invasiveness, potential for spread and identified socioeconomic and environmental impacts (Australian State of the Environment, 2021). Of the 32 WONS species, *Lantana camara* (Lantana), *Opuntia tomentosa* (Velvety Tree Pear) and *Senecio madagascariensis* (Fireweed) were identified during walk overs of the Rosevale Offset Property. No weed species on the National Environmental Alert list were identified however several species declared under the *Scenic Rim Regional Council Planning Scheme*; *Sporobolus pyramidalis* (Giant Rat's Tail Grass), *Baccharis hamifolia* (Groundsel), *Senecio madagascariensis* (Fireweed), *Sporobolus africanus* (Parramatta Grass) and *Opuntia stricta* (Common Prickly Pear). As well as two (2) potentially adverse invasives; *Celtis sinensis* (Chines Celtis), *Lantana montevidensis* (Creeping Lantana) and *Lantana camara* (Lantana).

Although preliminary site surveys and observations over the Rosevale offset property recorded a number of weed species both federally and locally listed as well as general pastural invasive, the most prevalent and potentially impactful to MNES is *Lantana camara* (Lantana). The Department of Agriculture and Fisheries (2023) indicates more than 1400 native species are negatively affected by Lantana invasion, including many endangered and threatened species. This largely occurs through the suppressive effect of Lantanas aggressive growth form, generally adversely impacting species richness and some soil faunal assemblages.

Lantana infestations suppress and inhibit the natural regeneration of regrowth vegetation on-site which directly limits the growth rates and regeneration of non-juvenile koala habitat trees and other species who forage and inhabit these including Grey-headed Flying-fox. Additionally, in areas blanket layers of *Lantana camara* form a barrier to terrestrial species, which would include limiting the Koalas ability to access areas containing NJKHTs. Further, as Lantana is a woody shrub with thin, combustible canes, it has been observed to create hotter bushfires, which significantly alters native vegetation communities and pastures (DAF, 2023). It is noted that under the Conservation Advice for Koala, increased intensity/frequency of bushfire is a listed key threatening process. Although this largely refers to the impacts caused by Climate Change, the presence of Lantana within bushland can significantly increase the extremity of bushfire and thus the impact it has directly on Koala and other listed species habitat; GHFF, Regent Honeyeater and Swift Parrot all rely on eucalypt bushland for foraging. For this reason, the Queensland Governments '*South East Queensland Koala Conservation Strategy 2022 – 2025'* lists management of invasive weeds in both Action Area 1: Habitat Protection and Action Are 3: Threat Management (DES, 2020). Impact management of invasive flora, particularly Lantana, a Weed of National Significance (WONS), is therefore considered a key direct action to addressing threats on Koala and other listed species that share the same habitat requirements.

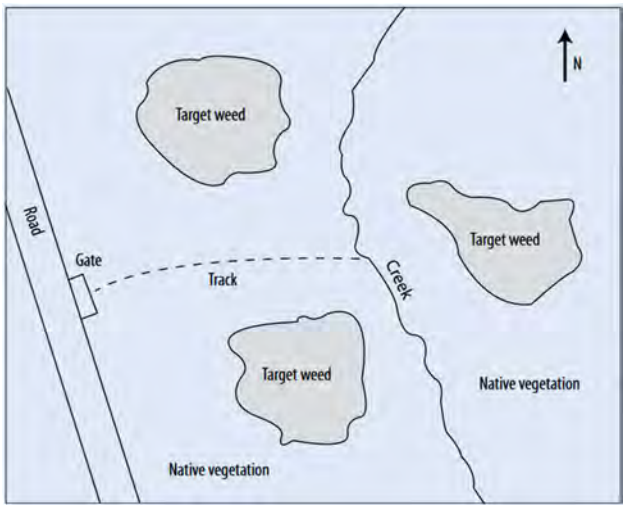
METHODOLOGY

Baseline weed extent mapping assessments were undertaken across the Rosevale Offset Property on 20th, 24th, 27th April and 5th May 2023 utilising an antenna-based GPS system to determine the extent of weed cover of WONS.

The primary weed species located within ROA 1 is *Lantana camara* (Lantana) which is classed as a WONS.

The percentage cover of WONS was determined using a method detailed in the *Guidelines for Monitoring Weed Control and recovery of native vegetation* (Auld 2009). In this method, weed areas are mapped on-ground followed by an estimation of the percentage cover of weeds.

Using an antenna-based GPS system, the spatial extent or patches of WONS within the offset area was mapped on-ground as polygons to produce a 'mud map' of the site (Insert 1).



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

An antenna-based GPS system was used to accurately delineate the areas on-ground. Weed mapping assessments of the offset property were conducted across seven days with observed WONS estimated and categorised into percentages. The mapping was undertaken using GPS units with polygons or descriptive points taken to visually represent on-ground invasive values. On ground estimates assigned a percentage to the invasive species observed, with ranges including little to no weeds (0%), 0 – 20%, 20 – 40%, 40 – 60%, 60 – 80%, and 80 – 100% (Table 42). A diagrammatic representation of 5%, 25% and 50% cover is provided in Figure 14.

The weed coverage and densities plan of the offset property will provide a guide to the areas requiring the most significant weed management.

Table 42: Classes for vegetation cover

Class	Percentage range
1	0
2	0-20
3	20-40
4	40-60
5	60-80
6	80-100

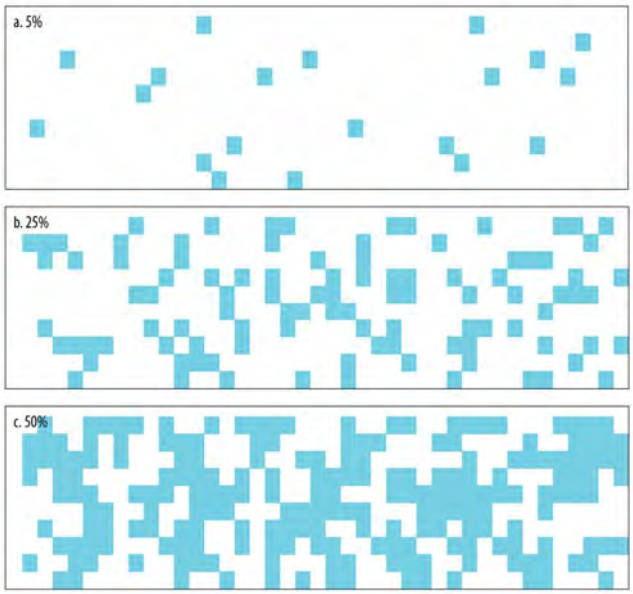
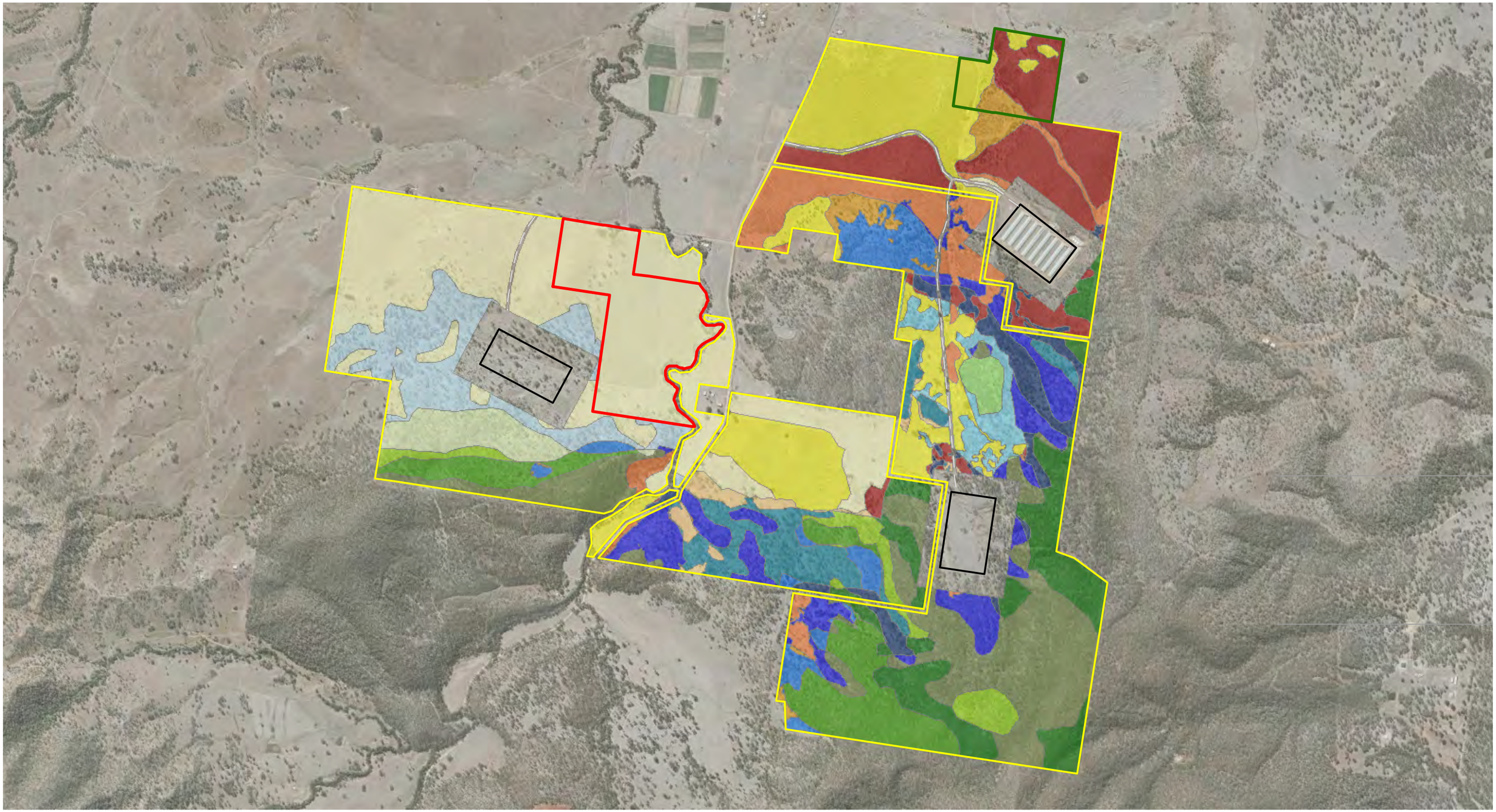


Figure 7. Shaded areas represent percent cover.

Insert 2. Extract from Auld (2009) – Figure 7.

Surveys to estimate the weed cover using the vegetation cover classes proposed by Auld (2009) will be used in milestone assessments at Years 5, 10, 15 and 20 of the offset in addition to MHQA transects which also involve a component of weed cover estimation. Results and progress against the management and monitoring actions will be reported on as part of the Annual Compliance Report.

13. Baseline Weed Mapping



Montauban Environmental Offsets

1:18,000

0 100 200 300 400 m

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
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Project: Rosevale Offset Area 3

Date: 23/10/2025

10559 E 13 OMP_P Baseline Weeds A

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Legend

- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Chicken sheds
- Poultry shed access track

Weed Coverage percentages

AU1	AU2	AU3
Little to no weed coverage (18%)	Little to no weed coverage (23%)	Little to no weed coverage (8%)
0-20% weed coverage (31%)	0-20% weed coverage (8%)	0-20% weed coverage (3%)
20-40% weed coverage (4%)	20-40% weed coverage (18%)	20-40% weed coverage (7%)
40-60% weed coverage (5%)	40-60% weed coverage (14%)	40-60% weed coverage (20%)
60-80% weed coverage (18%)	60-80% weed coverage (24%)	60-80% weed coverage (38%)
80-100% weed coverage (24%)	80-100% weed coverage (13%)	80-100% weed coverage (24%)

During ground-truthing and delineation of weed management areas all weed species were recorded. These are listed in Table 12 below. Two (2) species of WONS were recorded within the offset area being *Lantana camara* (Lantana) and *Senecio madagascariensis* (Fireweed). Seven (7) species of Category 3 restricted weeds listed under the Queensland *Biosecurity Act 2014* were recorded. The dominant weed species across the offset area is *Lantana camara* with occurrences of other weeds species scattered at low densities or confined to waterway environments at a cover less than 5%.

The spatial extent of weed dominated areas within the broader property are shown on Plan 13. This shows weed coverage within the ROA 3 is described as containing little to no weeds. The total estimated area of WONS across within AU1 is 3.79 ha based on a percentage cover of 10% and AU2 is 0.34 ha based on a percentage cover of 10%.

As ROA 3 has been historically cleared and currently used for cropping and cattle grazing WONS are relatively low (~10%) on average across the majority of the open paddock area. Therefore, impacts from Lantana on MNES habitat are not as significant at this stage. However, *Lantana camara* was noted to significant throughout the banks of the Bremer River and throughout the understorey where vegetation occurs within ROA 3. Therefore, once ploughing and cropping activities are discontinued there is a risk Lantana infestation may spread. Thus, control of the dense infestations and then continued suppression of Lantana and retaining low levels of weeds is proposed for ROA 3. Additionally, general weed management of other WONS and SRRC declared invasive species will occur as needed throughout the course of the offset life in order to prevent impacts to regenerative plantings.

Table 12: Weed species recorded within the offset area

Species Name	Common Name	Listing
Ageratum houstonianum	Blue Billygoat weed	
Ambrosia artemisiifolia	Annual Ragweed	Category 3 – restricted
Baccharis halimifolia	Groundsel	Category 3 – restricted
Bidens pilosa	Cobbler's Pegs	
Celtis sinensis	Chinese Elm	Category 3 – restricted
Chloris gayana	Rhodes Grass	
Corymbia torelliana	Cadaghi	
Gomphocarpus physocarpus	Balloon Cotton Bush	
Gomphrena celosioides	Gomphrena Weed	
Heliotropium amplexicaule	Blue Heliotrope	
Lantana camara	Lantana	WONS, Category 3 – restricted
Macroptilium lathyroides	Phasey Bean	
Megathyrsus maximus	Guinea Grass	
Melinis repens	Red Natal Grass	
Passiflora suberosa	Corky Passion	
Schinus terebinthifolia	Broad-leaved Pepper	Category 3 – restricted
Senecio madagascariensis	Fireweed	WONS, Category 3 – restricted
Senna pendula	Easter Cassia	
Setaria phacelata	South African Pigeon Grass	
Sida cordifolia	Flannel Weed	
Solanum chrysotrichum	Giant Devil's Fig	
Solanum chrysotrichum	Devil's Fig	
Solanum mauritianum	Wild Tobacco	
Sporobolus pyramidalis	Giant Rat's Tail Grass	Category 3 – restricted

Verbena bonariensis	Purple-top Verbena	

BASELINE FERAL ANIMAL SURVEYS

INTRODUCTION

Targeted fauna surveys have been utilised throughout the offset site to determine the presence of species as well as understand the relative abundance of terrestrial fauna species, with a particular focus on Wild Dogs, which are identified as a key threatening process to Koala. Other notable pest species, such as European fox and feral cat, were also a secondary focus due to their potential direct impact to MNES via opportunistic predation. Additionally, herbivorous pest species with potential indirect impacts to MNES due to habitat destruction (i.e., feral pigs, European rabbit and feral deer) were also surveyed for throughout the ROA 3 offset.

Guidelines for tracking feral animal abundance

At present, DCCEEW does not have a published guideline for detecting feral animals. However, there are State guidelines available for the implementation of feral animal monitoring focusing on wild dogs including the Guide for camera trapping wild dogs, foxes and feral cats (Department of Primary Industries, NSW Government 2018).

For successful monitoring of feral animal abundance, camera trapping is frequently utilised and remains the industry standard. Camera traps have the advantage of obtaining a wide range of significant information based on the set up. Automatic camera systems are triggered by an animal passing in front of a sensor that detects movement, changes in ambient light, or a thermal differential (Moen & Lindquist 2004). Cameras allow for the detection of species that are difficult to study due to their elusive or nocturnal habits (Mace et al. 1994). Camera deployment is less time consuming, less costly, and less invasive than long-term direct observation of animals. They are also beneficial in studying animals in inaccessible or difficult to access locations such as dens and nest cavities, or in rugged terrain (Mace et al. 1994). In addition, they enable the collection of valuable information about multiple species within any given community (Rosellini et al. 2008) and provide data that is more permanent and less disputable than data gathered by direct observation. Furthermore, camera trapping allows consistent and repeatable surveys to be completed by placing the same cameras in the same locations using the same settings for the same length of time and set with the same bait. The repeatability of motion sensor camera trapping means it is an appropriate method to monitor changes of the abundance of feral animals over time.

METHODOLOGY

Design and Procedure

Motion sensor cameras were deployed across the entire proposed Rosevale Offset Property and within the ROA 1 offset area in order to provide baseline data. Baseline surveys including the use of baited camera trapping and trail cameras (non-baited) targeting wild dogs and pest herbivore species such as wild pigs and deer, were completed over multiple years and seasons. Focus was given to the eastern portion of the property where existing chicken sheds are present as the Department has identified concerns with the presence of this practice, as well as adjacent to property boundaries and existing tracks where Wild Dogs are most often seen. Property-wide baseline data allows for feral animal abundance and trends to be ascertained at the broader landscape scale and allow for management actions to be targeted over the broader properties. The following installation methods were applied:

- Cameras should not be placed on an animal trail if results are to be used to compare relative abundance, however, animal trails are a good place to site cameras for inventory surveys.
- Avoid heavily vegetated areas as vegetation can cause false triggering or obscure animals in images.
- Securely attach camera 30-50 cm from the ground on a tree or post, directed downward towards the bait which should be 1.5-2 m from the camera and in the centre of the camera frame.
- Camera traps should be deployed for as long as possible with a recommended minimum of four nights but ideally for longer than two weeks and up to five weeks.
- Ensure the camera programming is consistent across all cameras to be deployed.
- Cameras can be baited with vegetable based and/or meat-based baits depending on the target species and personal choice.
- For general monitoring purposes, cameras can be set up along cleared tracks utilised by wild dogs, with or without bait.
- Baseline feral animal management surveys were conducted by suitably qualified field ecologists (details located at Appendix C).

Fourteen camera traps were set up within the broader offset property across 3 different survey periods in 2023 – April to May, May to August and August to November (Plan 14). With a total of one hundred and eight-seven (187) survey nights through Autumn, Winter and Spring. The cameras were systematically located to capture a representative of Offset Property. Cameras were attached 30-100 cm from the ground on a tree or post and directed towards landscape features and baited in order to target evidence of wild dogs and other potential threats to known MNES in the broader area. Each trap site considered the pre-clear regional ecosystem communities as well as current on-site conditions, including density of vegetation and habitat features.

Motion sensor cameras were deployed across the entire proposed offset area for determining baseline data, within the approved offset area within Lot 115 on SP167206 and more recently on the eastern side of the existing chicken sheds adjacent to property boundaries and existing tracks. The varying survey periods and camera deployment was to determine the baseline survey results with reference to the *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland June 2022 (V 4.0)* for completing terrestrial fauna surveys. Motion sensor cameras were attached 30 – 50 cm from the ground on a tree or post, directed downward towards a bait station attached to a tree or post 1.5 – 2m from the camera and in the centre of the camera frame. Table 5 outlines the camera trap survey periods and details of baits utilised across the offset property.

Section 5.2 of *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland June 2022 (V 4.0)* refers to bait type and the use of peanut butter and oats as a good general-purpose bait for the survey of small to medium sized mammals, although the use of other baits or additives can increase detection rates of some target species. It is also considered that habitat with dense vegetation may render some survey techniques, particularly those that rely on search effort, less effective due to reduced visibility.

Table 5: Summary of survey periods for motion sensor camera deployment across the offset property.

Camera Deployment Period	Number of Cameras Deployed	Camera Deployment Date	Camera Pick-up Date	Baits Utilised	Number of Days Recording
1.	6	20th April, 2023	4th May, 2023	Peanut butter & oats	15
2.	4	15th May, 2023	11th August, 2023	Chicken necks	89
3.	4	11th August, 2023	2nd November, 2023	No-baits	83

Camera monitoring locations and timing

While it is noted in the approval conditions define seasonal monitoring requirements across summer, winter, autumn and spring, broadscale camera trapping has been completed over the majority of 2023 which is considered to cover the life cycle of the primary target pest species being wild dog. This period encompasses part of the wild dog breeding season which occurs typically from April to June 2024 (Queensland Government, 2024).

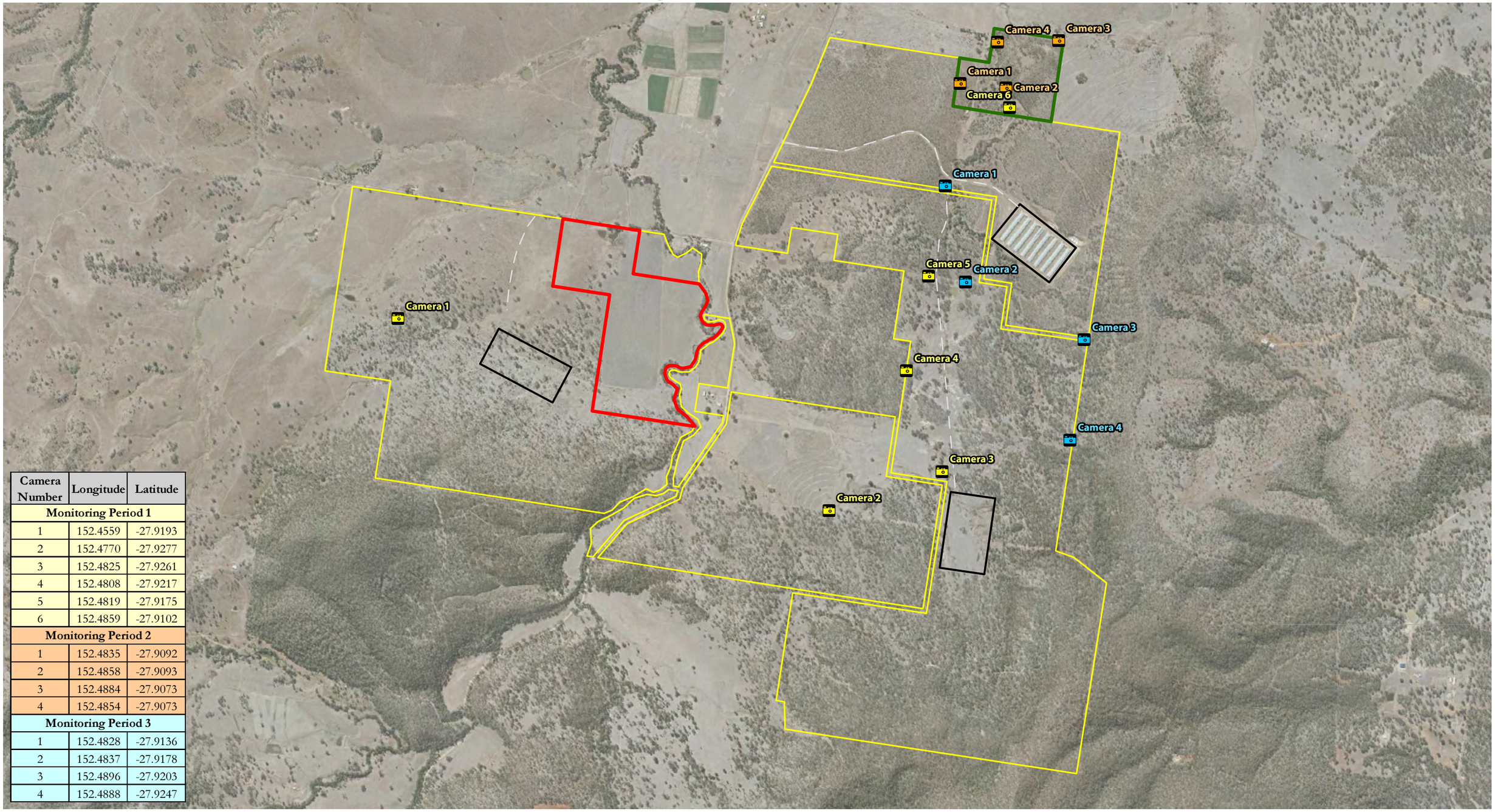
As stated in Section 4.6 of *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland June 2022 (V 4.0)* the patterns of faunal activities and estimates of relative abundance, or presence-absence of species, varies temporally in response to the time of day (day versus night), seasonal changes (spring versus winter) as well as between years (drought versus wet). It is noted that in South-east Queensland, the optimal time and conditions for vertebrate surveys are in Spring (mid-September – mid-December) as temperatures begin to warm up and particularly after the first storms when animal activity peaks. The second most suitable survey period is in Autumn (late February – April) when high summer temperatures begin to drop and before the onset of colder overnight temperatures.

Cameras were deployed generally in accordance with these guidelines, however, for significantly longer periods of time to optimise data collection and results.

The guidelines for Generic Survey Methods for a Site (Section 8 of the Guidelines) recommend a minimum camera trapping is for one camera per site for four nights, particularly for recording presence / absence and relative abundance, partly for reptiles, and small terrestrial mammals and more suitable to medium to large terrestrial mammals. Between April 2023 – November 2023, data was recorded for a total of one hundred and eight-seven (187) nights, well above the minimum amount recommended.

The location of baseline pest camera monitoring is shown on Plan 14.

14. Baseline Pest Camera Monitoring



Camera Number	Longitude	Latitude
Monitoring Period 1		
1	152.4559	-27.9193
2	152.4770	-27.9277
3	152.4825	-27.9261
4	152.4808	-27.9217
5	152.4819	-27.9175
6	152.4859	-27.9102
Monitoring Period 2		
1	152.4835	-27.9092
2	152.4858	-27.9093
3	152.4884	-27.9073
4	152.4854	-27.9073
Monitoring Period 3		
1	152.4828	-27.9136
2	152.4837	-27.9178
3	152.4896	-27.9203
4	152.4888	-27.9247

Montauban Environmental Offsets

1:18,000

0 100 200 300 400 m

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
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Project: Rosevale Offset Area 3

Date: 23/10/2025

10559 E 14 OMP_P Baseline Pest Camera A

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Legend

- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Chicken sheds
- Poultry shed access track
- Monitoring Period 1 Camera
- Monitoring Period 2 Camera
- Monitoring Period 3 Camera

Site Camera Deployment 1 – April to May 2023

Six cameras were deployed across the entire proposed offset area to determine baseline data. Each trap site considered the pre-clear regional ecosystem communities as well as current on-site conditions, including density of vegetation and habitat features. Motion cameras were deployed between the 20th April through to the 4th May, 2023, totally fifteen (15) days of assessment. All motion cameras were deployed with non-meat-based baits including peanut better and oats for general results. The results varied across the site with common species including *Trichosurus vulpecula* (Common Brushtail Possum), *Phascogale tapoatafa* (Brush-tailed Phascogale), and *Macropus rufogrisues* (Red-necked Wallaby) recorded in most of the results in each camera. Up to ten (10) *Sus scrofa* (Feral Pig) was also recorded at Camera 3, which was deployed adjacent to an existing dam. Four (4) wild dogs have been detected on Camera 4 and two (2) European foxes were recorded during this survey period. Details of each camera installation and location are provided in Table 43.

Table 43: Camera summary – deployment period 1 (20th April to 4th May 2023)

ID	Latitude	Longitude	Photo	Description of location
1	-27.91929828940	152.45585257800		Camera 1 was deployed in Lot 1 on CC3571 within Category C vegetation mapped as containing a composite Least Concern Regional Ecosystem community containing 80% RE12.8.17 and 20% RE12.8.14.
2	-27.92774891030	152.47698854800		Camera 2 was deployed along the northern boundary of Lot 103 on CH311018 on the edge of Remnant Least Concern RE12.8.17 and High Value Regrowth also containing Least Concern RE12.8.17.

ID	Latitude	Longitude	Photo	Description of location
3	-27.92606866940	152.48254838200		Camera 3 was deployed in Lot 24 on CH312265 adjacent to an existing dam. Vegetation is currently mapped as containing High Value Regrowth containing a composite Of Concern Regional Ecosystem community containing 45% RE12.8.16, 30% RE12.8.17, and 25% RE12.8.14.
4	-27.92166466160	152.48081831600		Camera 4 was deployed on the western boundary of Lot 71 on CH311061. The vegetation directly west is mapped as a composite Of Concern Regional Ecosystem community containing 45% Of Concern RE12.8.16, 30% Least Concern RE12.8.17 and 25% Least Concern RE12.8.14. A cleared dirt track occurs along the property boundary which was utilised for the camera deployment.
5	-27.91754789670	152.48192522400		Camera 5 was deployed in the southern portion of Lot 211 on CH3114636 and is located in Category C High Value Regrowth vegetation containing a composite Of Concern Regional Ecosystem community containing 45% Of Concern RE12.8.16, 30% Least Concern RE12.8.17 and 25% Least Concern RE12.8.14.
6	-27.91020562720	152.48594307400		Camera 6 was deployed adjacent to an existing dam in Lot 115 on SP167206 within an approved offset area. The vegetation is mapped as Endangered Remnant Regional Ecosystem containing 90% Endangered RE12.3.3 and 10% Least Concern RE12.3.7.

Site Camera Deployment 2 – May to August 2023

Four camera traps were deployed within the approved offset are within part of Lot 115 on SP167206, Montauban Offset. Each trap site considered the pre-clear regional ecosystem communities as well as current on-site conditions, including density of vegetation and habitat features. All cameras were deployed from the 15th May, 2023 through to 11th August, 2023 (total eighty-nine days).

All cameras throughout the survey period were baited with meat-based bait (chicken necks). These were placed in cleared areas adjacent to slashed vehicle tracks to detect any movement of wild dogs and increase the general detection of fauna movement and abundance. The placement of cameras throughout the second deployment also considered site conditions including habitat features, proximity to water, density of vegetation and opportunity for fauna movement. No wild dogs were recorded throughout this survey period. Details of each camera installation and location are provided in Table 44.

Table 44: Camera summary – deployment period 2 (15th May to 11th August 2023)

ID	Latitude	Longitude	Photo	Description of location
1	-27.90915479060	152.48351207300		Camera 1 was deployed in the western portion of the offset area within an area previously mapped as containing Least Concern RE12.8.17. This area has historically been managed as forestry, including plantings of *Eucalyptus saligna* (Syndey Blue Gum) however due to site conditions has not been successful. The area contains some scattered remains of the forestry planting amongst a ground layer dominated by both native and exotic pastoral grasses and scattered patches of *Lantana camara* (Lantana). Woody debris is high within the area due to the failed forestry plantings.
2	-27.909333594	152.485766808		Camera 2 was deployed within an area previously mapped as containing a composite Regional Ecosystem community mapped as containing 90% Endangered RE12.3.3 and 10% Least Concern RE12.3.7. This camera was placed offset to the existing dam amongst regrowth vegetation representing the pre-clear regional ecosystem community. It is noted that a slashed vehicle track surrounds the dam

ID	Latitude	Longitude	Photo	Description of location
				which is considered as a high use area for vertebrate fauna, including increasing recordings of wild dogs.
3	-27.90730013040	152.488363183		Camera 3 was deployed towards the northeast corner of the approved offset area near the boundary between the mapped Endangered RE and the Of Concern RE. Although the location of the camera is shown in the composite Endangered RE (Camera 2), site conditions suggest that the camera is within the Of Concern Composite RE containing 45% Of Concern RE12.8.16, 30% Least Concern RE12.8.17 and 25% Least Concern RE12.8.14. This area has historically been managed as forestry plantings however contains some regrowth species consistent with the pre-clear regional ecosystem communities. The camera has been placed offset to the property boundary which contains a slashed vehicle track for maintenance purposes. It is noted that the adjacent property is mostly cleared and is managed for cattle grazing.
4	-27.90734306100	152.48536560700	N/A	Camera 4 was also deployed with vegetation like Camera 2 including within an area previously containing a composite Regional Ecosystem community mapped as containing 90% Endangered RE12.3.3 and 10% Least Concern RE12.3.7.

Site Camera Deployment 3 – August to November 2023

Four camera traps were deployed within the approved offset are within part of Lot 115 on SP167206, Montauban Offset. Each trap site considered the pre-clear regional ecosystem communities as well as current on-site conditions, including density of vegetation and habitat features. All cameras were deployed from the

15th May, 2023 through to 11th August, 2023 (total eighty-nine days). Cameras were then moved to areas surrounding the Approved Offset area, south and east of the existing chicken shed from the 11th August, 2023 through to 2nd November, 2023 (eighty-three days). Five (5) dogs were observed through this survey period. Details of each camera installation and location are provided in Table 45.

Table 45: Camera summary – deployment period 3 (11th August to 2nd November 2023)

ID	Latitude	Longitude	Photo	Description of location
1	-27.91361530610	152.48276964700		Camera 1 was deployed in the Southeast corner of Lot 116 on SP167206 adjacent to an existing track and vegetation associated with a mapped waterway. The camera is in non-remnant vegetation.
2	-27.91779423900	152.48374456700		Camera 2 was deployed on the northern property boundary of Lot 71 on CH311061 adjacent to an existing dam. The vegetation is mapped as Category C High Value Regrowth containing a Of Concern composited regional ecosystem community containing 45% Of Concern RE12.8.16, 30% Least Concern RE12.8.17 and 25% Least Concern RE12.8.14. Vegetation within this portion of the site contains established *Eucalyptus moluccana* (Gum Topped Box) with a relatively open understorey and shrub layer. The paddock appears to be regularly grazing from cattle.

ID	Latitude	Longitude	Photo	Description of location
3	-27.92034623730	152.48955937600		Camera 3 was deployed on the northeast corner of Lot 24 on CH312265 within Least Concern Remnant vegetation containing 85% Least Concern RE12.8.17 and 25% Least Concern RE12.8.14.
4	-27.92471553210	152.48883771500		Camera 4 was deployed on the boundary of Lot 24 on CH312265 on the edge of Remnant vegetation containing 85% Least Concern RE12.8.17 and 25% Least Concern RE12.8.14 and Category C High Value Regrowth. The camera is set up along an existing track.

Camera Trap Surveys – Feral Animal Management

Table 46 includes a summary of the species identified during the camera trap survey periods. Plan 14 shows the locations of the camera trap deployment. The results varied across the site with common species including *Trichosurus vulpecula* (Common Brushtail Possum), *Macropus giganteus* (Eastern Grey Kangaroo), *Phascogale tapoatafa* (Brush-tailed Phascogale), and *Macropus rufogrisues* (Red-necked Wallaby) recorded in most of the results in each camera during camera deployment period 1. Multiple *Sus scrofa* (feral pig) were also recorded at Camera 3 which was situated adjacent to an existing dam (Photo Plate 3). Four (4) *Canis familiaris* (wild dog) were detected on Camera 4 (Photo Plate 4) and a *Vulpes vulpes* (European red fox) was recorded at Cameras 2 and 3 (Photo Plate 5). No wild dogs were recorded during camera deployment period 2. Eight (8) wild dogs were detected during camera deployment period 3 (Table 47).

The raw camera monitoring data is provided at Appendix E.

Table 46: Species recorded on motion cameras

Species	Common Name	Camera Deployment 1	Camera Deployment 2	Camera Deployment 3
Anas superciliosa	Pacific Black Duck	✓		
Chenonetta jubata	Australian Wood Duck	✓		
Egretta novaehollandie	White-faced Herron	✓		
Ardea ibis	Cattle Egret	✓		
Ardea intermedia	Intermediate Egret	✓		
Gallinula tenebrosa	Dusky Moorhen	✓		
Vanellus miles	Masked Lapwing	✓	✓	
Centropus phasianinus	Pheasant Coucal	✓		
Gymnorhina tibicen	Australian Magpie	✓	✓	✓
Corvus orru	Torresian Crow	✓	✓	✓
Strepera graculina	Pied Currawong	✓	✓	
Tachyglossus aculeatus	Echidna	✓	✓	
Phascogale tapoatafa	Brush-tailed Phascogale	✓		
Isoodon macrourus	Northern Brown Bandicoot	✓	✓	
Trichosurus vulpecula	Common Brushtail Possum	✓	✓	✓
Macropus rufogriseus	Red-necked Wallaby	✓	✓	✓
Macropus parryi	Whiptail Possum	✓	✓	✓
Macropus giganteus	Eastern Grey Kangaroo	✓	✓	✓
Sus scrofa	Feral Pig	✓		
Canis familiaris	Wild Dog	✓		✓
Bos taurus	Cattle	✓		✓
Vulpes vulpes	European Red Fox	✓		

Table 47: Motion sensor camera feral animal results

Site Camera Deployment	Number of Cameras Deployed	Total Days Recording (number of camera x number of days)	Total wild dogs records	Total foxes recorded	Total feral pigs recorded
1.	6	90	4	2	6
2.	4	356	0	0	0
3.	4	332	8	0	2
Total	**14**	**778**	**12**	**2**	**8**



Photo Plate 3: Feral pigs (*Sus scrofa*) recorded during deployment 1.



Photo Plate 4: Wild dog evidence recorded on the offset property.



Photo Plate 5: European red fox (*Vulpes vulpes*) recorded during deployment 1.

Feral Animal Relative Abundance Index

The motion sensor camera detection survey (recorded number of occurrences over days of camera deployment) was utilised to provide relative abundance over the Offset Area, reducing bias and increasing repeatability. A relative abundance index (RAI) is then calculated for feral animal abundance, using the formula RAI= D/TN x 100, where D is numbers of detections and TN is the total number of camera-trap nights (all cameras combined). This methodology ensures that the surveys are representative of the entire area and are repeatable for future monitoring requirements. RAIs are completed for predator pest species (wild dogs and foxes combined) and herbivorous pest species (feral pig).

Based on the total survey period twelve (12) wild dogs, two (2) European red foxes and eight (8) feral pigs were detected via motion camera at various locations throughout the site (Table 47). A total of fourteen (14) cameras were deployed throughout this period and totals seven hundred and seventy-eight (778) camera nights.

The baseline RAI of predator pest species (wild dogs and European red foxes) on site is therefore 1.79. The RAI for wild dogs only is 1.16.

The baseline RAI of herbivorous pest species (feral pigs) which have potential to damage MNES habitat is 1.02.

6. OFFSET DESIGN CONSIDERATION AND AMENDMENTS

POULTRY FARM MITIGATION OF POTENTIAL IMPACTS

During office and onsite discussions concerns raised by the Department around incompatible land uses focused more towards potential indirect impacts of poultry farm operations, relating to:

1. Access and Traffic and Machinery Management
2. Noise
3. Light
4. Surface and Stormwater Management
5. Odour

The Poultry Industry and any approved facilities are extensively regulated by the *National Environmental Management System for the Meat Chicken Industry – Version 2*, in relation to legal requirements, natural resources and amenity, operation, design and management and monitoring, recording and reviewing. The Processors Grower's Manual, the RSPCA Meat Chicken Farming Scheme Standard and the RSPCA Operation Manual which these facilities adhere to, outline standard operational procedures that drive the necessary completion of a Site Based Environmental Management Plan (SBEMP), which covers the above potential impacts and management in detail.

Each of these potential indirect threats or incompatible land use activity are discussed in relation to impacts on MNES within this section of the OMP along with a number of other offset design amendments.

It is noted that in South East Queensland the poultry operations are specifically considered as a preferred land use for the preservation of biodiversity values because of the small footprint of the activity. One of the original Queensland Government koala protection legislation tools – *State Planning Policy 1/97 – Conservation of Koalas in the Koala Coast* states the following under compatible land uses:

> *Compatible development*
>
> *5.7 Development proposals would be compatible with conserving koala habitat values if all the following criteria are met:*
>
> *little or no clearing of habitat would be required;*
>
> *for sites in the Koala Conservation Area, minimal additional night-time traffic movements would be generated on the road network in the Koala Conservation Area;*
>
> *any impedance or threats to the movement of koalas through or across the site would be minimised;*
>
> *there would be no other significant detrimental environmental impacts on the koala habitat values in the surrounding area; and*
>
> *koala habitat values would be substantially maintained or enhanced.*
>
> *5.8 The Koala Coast's proximity to a large urban population and major tourist destinations should provide opportunities for a range of activities that can be designed in ways that are consistent with the above criteria and conserve the environmental qualities of the area. Some examples are small-scale*

individual manufacturing, distribution or storage enterprises; home-based businesses; and 'nature-based' recreation/tourism facilities and activities (including those enabling people to experience koalas in their natural habitat). Intensive poultry farming is an example of agricultural development which, if properly planned and managed, is able to meet these criteria. Similar agri-businesses might also be appropriate.

(SPP 1/97 – Page 6 – Underlining added)

The result of State Planning policy 1/97 sees large clusters of poultry operations located amongst core koala habitat in the Redlands and Logan areas. No evidence or research has been documented that these areas have a higher degree of wild dog and fox populations due to these activities, however koala records have been observed to remain high at these locations.

OFFSET DESIGN CONSIDERATIONS

Despite concluding that conflicts or impairment of MNES habitat is unlikely to occur and that the outcomes committed to through the offset site management actions will not be defrayed by the adjoining poultry operations out of caution the offset design has been amended to exclude any land within 100 m of any poultry farm use area from future offset usage. In some areas this offset zone already contains areas of MNES habitat and evidence of usage (koala scat). The purpose and benefits of this design change are:

1) To create a clear and expanded area of delineation between uses through the 100 m setback.
2) Ameliorate any potential indirect outcomes of the poultry operation (light, noise, etc) through the separation
3) Avoid offset activities (new plantings, etc) occurring immediately adjacent to operational areas
4) Importantly, with approval the land allotments will be reconfigured to place the poultry facilities on their own separate title. The benefits of this are:
    a. No confusion or overlap on what uses are permissible or prohibited on each land title.
    b. Legally securing measures for offset areas can encumber the entire title on which offset are proposed.

Operational Management and Controls:

1. Road, Traffic and Machinery Management

Potential activities associated with the poultry operation include:

- Staff access
- Truck access for bird change over / feed
- Access for maintenance
- Daily machinery activities (tractor / UTV) movements

Potential impacts associated with these activities if unregulated include:

- Animal vehicle conflict
- Noise
- Light

- dust

The existing poultry facilities are accessed off Tarome Road, which is a rural road containing a mix of dirt and bitumen stretches along the farm boundary. A single gravel entry road accesses the shed area from Tarome Road and is controlled via a security gate to prevent unlawful access. Vehicles using the access track regularly are limited to staff with a daily role at the poultry operations. 2.5 people are employed on this basis and weekly access is limited to entry and exit to the worksite. Intermittingly maintenance works, refuelling trucks etc will utilise the track. Larger trucks to load and transport market mature chickens occur in approximately 6 week cycles subject to conditions. There are typically two chicken transports cycles approximately targeting the 35th and 48th day.

The facility does not operate functionally at nighttime with hours of operation generally between 7am and 6pm. There is no permanent external lighting requirements at the facility. The Site Based Environmental Management Plan includes a raft of management protocols generally designed around safety and public nuisance, however, serve to provide additional management to any even low risk potential for MNES conflicts. Actions outlined in relation to this item include:

- Security to prevent unlawful access.
- Max speed limit on-site set to 20 km (All vehicles at site observed as much slower than this limit)
- Truck exhaust brakes prohibited (Air brakes strictly prohibited)
- All farm machine fitted with Manufacturer specified exhaust equipment

The access track is a typical on farm gravel road, equivalent to most tracks on large scale rural properties, containing 3m of gravel and grass swale edges (Photo Plate 6). The track does not encumber movement by a koala any more than an access track required to maintain offset activities. Any tracks providing access to the poultry operations are excluded to a width of 15m from the offset calculations. The land will be encumbered by the legally securing mechanism to ensure future management control, however as the tracks will not be planted with new habitat trees the land area is excluded from calculations.



Photo Plate 6: Current gravel farm tracks on-site reflecting proposal for future poultry farming access tracks

NOISE MANAGEMENT

For broiler facilities which utilise fully enclosed and sealed sheds noise is not a known impact as part of the operation as birds cannot be heard external to the facilities they are housed. The performance, behaviour and growth of the birds is highly sensitive to noise and a number of mechanical inclusions and methods are deployed to muffle motors and fans, including the use of acoustic enclosures. Some noise would be expected during the construction of the remaining shed facilities, however this is a quick and temporary process. Once operational remaining noise generating activities relate to vehicle movements, loading and unloading and maintenance of machinery, which are all very intermittent and not beyond those occurring on adjacent properties with cattle yards and transport. Intermittingly the low hum of the ventilation fans occurs in direct response to temperature conditions and can only be heard at or downwind of the fan locations when they are running.

Matters of National Environmental Significance and evidence of MNES usage has been consistently located on-site, specifically koala scat recorded in vegetation adjacent to the existing shed facilities. Noise is not considered to impair offset use of the land, particularly with the inclusion of the 100m setback to offset activities.

LIGHT MANAGEMENT

The poultry farm, hours of operation are 7 am until 6 pm and the facility is not staffed overnight. Not permanent external lighting occurs or is proposed. On remote occasions when there is an issue or staff commence early or

work late vehicle lights will occur on the track, however this is rare and not considered additional to undertaking nighttime ecological surveys.

No aspects of the operations lighting will influence any outcomes or usage of the offset for MNES.

SURFACE & STORMWATER MANAGEMENT

The risks associated with surface and stormwater for poultry operations links to nitrogen and phosphorus contamination directly for the shed pad moving to run off to sensitive environments. Although both of these chemicals occur naturally in vegetated areas and waterways excessive quantities can lead to impacts resulting in native plant dieback and algae populations in waterways.

Surface and Stormwater fun off in the poultry industry is governed by the *QLD Environmental Protection policy (Water and Wetland Biodiversity) 2019* which stipulates the following minimum parameters:

- No worsening of stormwater discharges into downstream properties
- No worsening of flood plain extents
- No increased risk of contamination of downstream receiving waters

Additionally, the *Scenic Rim Regional Council Planning Scheme* regulates the poultry use through the codes and policies. Both regulations result in a number of internal and external controls. Internal controls include:

- Concrete nib walls surrounding the base of the sheds to prevent run off entering the shed areas and to contain water within.
- Used bedding or litter is removed from the site
- During shed wash downs no water is discharged from the shed area – temperature controls and ventilation fans are used to evaporate the water.

Externally the shed areas are located away from waterways and contain permitter diversion drains to prevent run-off into the shed areas. Rainwater felling directly within the shed area is directed through a treatment drain made up of:

- Grassed swales in between each shed area, directed to:
- Vegetated filters strips at either end of the swale areas, discharging to
- Detention basins sized to capture retain and treat on-site run off

An extensive water quality monitoring program is mandated by the regulations to ensure not net increase in pollutants occurs beyond the detention basin system. All of these facilities occur immediately surround the shed infrastructure meaning a further 100m set back is applied to any offset activities.

ODOUR MANAGEMENT

The poultry industry has long been associated as a major producer of odour pollution, primarily in connection with the impact this has on neighbouring homes, users and other sensitive receptors. Historically odour sources within the poultry industry was attributed to:

- Decomposition of manure often mixed with bedding and debris (usually occurs when wet)

- Poorly stored and spoiled feed supplies
- Dead animal removal and storage

Significant advancement and controls now apply to major poultry operations which remove or minimise these odour producing activities. Poultry sheds located on the Rosevale site are fully insulated, temperature-controlled facilities. Every aspect of the operation is regulated.

Odour caused through the decomposition of manure mixed with bedding is created when water is added resulting in an ammonia smell (known as 'wet litter'). This outcome is neither good for surrounding nuisance odour levels nor healthy for the birds and thus a raft of innovations and management protocols exist to remove and limit this outcome, including:

- Sealed, controlled and ventilated sheds preclude impacts of rain or high moisture content increasing the humidity within the shed facility maintaining the optimal conditions to keep bedding areas dry.
- Daily inspections occur to ensure the temperature and humidity are maintained the bedding areas are tilled and replaced. Litter is maintained in a dry and friable condition.
- Spent litter is disposed off-site via covered trucks.
- Feed is stored directly within the sealed ventilation sheds.
- Dead birds are collected daily in all sheds. Dead birds must be removed and located in a cold room where they are stored in sealed containers prior to contractor off site removal (minimum twice weekly).

Of particular concern during discussions with the Department appeared to be the potential for the odour emanating from the poultry sheds to additionally attract wild dogs and foxes, known threats to the Koala. This risk is noted for free range chickens which are directly exposed to the threat, however there is not easily identifiable research linking evidence of this same threat occurring for insulated and contained broiler sheds.

ATTRACTION OF WILD DOGS

Wild dogs are known to the site and broader areas, like most rural locations in South-East Queensland. Wild dogs have been recorded at the offset property including over 3km away from the existing shed facilities. They are also known to the Audale Offset site 2km to the south and the Aroona Station Offset site 4.5km to the north-west. Based on preliminary assessment of Wild Dogs and other pest species within the Offset Property via infrared fauna cameras across 3 separate survey periods (April – May, May – August and August – November), only nine (9) Wild Dogs were recorded over 778 camera nights by a total of 14 cameras (refer Table 21). Based on the relative abundance index (RAI) the total abundance of wild dogs within the Rosevale Offset Property is 1.16. The relative number of sightings across the survey time is not considered to suggest there are significantly more Wild Dogs within the area as a result of poultry farming activity. This is particularly true when compared to the pest species results from the Aroona Offset Site (EPBC 2016/7818) annual compliance reporting. This offset site is 5 km north of the Rosevale Offset Property and does not have poultry farming within or adjacent to the approved area. Regardless, prior to management of the area, abundance of dogs across the offset area was recorded at 3 in 2019, 10 in 2020 and 8 in 2021. These numbers are similar to the recordings on-site despite no poultry farming being present. Therefore, it can be inferred that the presence of the poultry farms has not increased wild dog presence. Similarly, only 2 foxes were recorded within the Rosevale Offset Property during baseline surveys. This is again similar to or less than the recorded numbers at the approved Aroona Offset which recorded 2 in 2019, 3 in 2020 and 6 in 2021.

Furthermore, poultry farms biosecurity measures and pest control are often based around disease control and controlling rodents with fencing and specialised shed design keeping out unwanted pest species. Much of the literature surrounding Wild Dogs refers to their impacts on sheep, cattle and goats rather than poultry farming as there is a lot more opportunity for predation on these animals than on chickens contained in sheds. Additionally, Wild dogs and European Fox are known throughout the region regardless of the presence of agricultural farming as they also predate on other invasive species; European Hare, Feral Pig as well as native mammals; Kangaroos, Wallabies, Bandicoots, etc. European Fox in particular are opportunistic feeders and therefore are not particular in the areas they choose to live.

Both of these species widely known to be a threat to livestock and native fauna, hence their inclusion in the *Biosecurity Act 2014* and *Scenic Rim Regional Council Declared Pest Animals or Weeds*. In 2022 Scenic Rim Regional Council identified a spike in Wild Dog populations around national parks, particularly within the Canungra locality where large areas for breeding are present (Sheehan and Forbes, 2022). These areas are identified as being an epicentre for Wild Dog populations as there tends to be no formal control programs in place as these are often associated with agricultural activities. Cattle farming surrounding the proposed offset property, although not by law required to control Wild Dogs, European Fox, Feral Pigs, etc., outside of General Biosecurity Obligations outlined in the *Biosecurity Act*, likely undertake their own pest control procedures. Additionally in mid-April 2023, SRRC introduced the 1080 baiting programme to assist owners of larger land holdings in managing pest animals and guides landowners through the legislative requirements of baiting (SRRC, 2023c). Although again not under law to do so, the programmes roll out will benefit those at the centre of agricultural production as they make easier to gain access to control methods and ultimately have been proposed to work best when neighbouring properties are in co-ordination. Therefore, the encouragement of agricultural landholders in the region to control pests benefits the Rosevale Offset Property and the proposed efforts associated with the ROA 3 offset.

7. ROSEVALE OFFSET AREA 4 MANAGEMENT ACTIONS

There are six (6) management actions identified as relevant and necessary for the ROA 3 to achieve outcomes which will benefit the impacted MNES and/or their potential foraging habitat. The management actions focus on the recreation of habitat for the impacted protected matters, while also reducing threats. Although there may be overlap between some of the management actions, all management actions are considered to contribute to the improvement of MNES habitat at the offset area and over the broader site.

Where logical, performance indicators have been transcribed from the Offset Assessment Chapter included in the Preliminary Documentation Submission (Saunders Havill, 2025). This includes the use of the *Modified Quality Habitat Assessment* (MHQA) method to set benchmarks and targeted improvements within the offset area.

Management actions have been proposed with consideration of the National recovery plan for the Koala *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory) (DAWE, 2022) and National recovery plan for the Grey-headed Flying-fox *Pteropus poliocephalus* (DAWE, 2021), National Recovery Plan for the Regent Honeyeater (*Anthochaera phrygia*) (DoE, 2016) and National Recovery Plan for the Swift Parrot *Lathamus discolor* (2024). Additionally, relevant threat abatement plans (for predation by European red fox and predation by feral cats), site-specific desktop and field assessments and numerous peer-reviewed papers and studies relevant to the relevant threatened species has been utilized to inform the proposed management actions.

Actions to be completed in accordance with this OMP include:

- Management Action 1: Feral Animal Control (primarily targeting Wild Dogs)
- Management Action 2: Weeds of National Significance Control (prevention and management)
- Management Action 3: Stock Management and Cropping Discontinuation
- Management Action 4: Access and Trespass Management
- Management Action 5: MNES Habitat Restoration
- Management Action 6: Bushfire Management

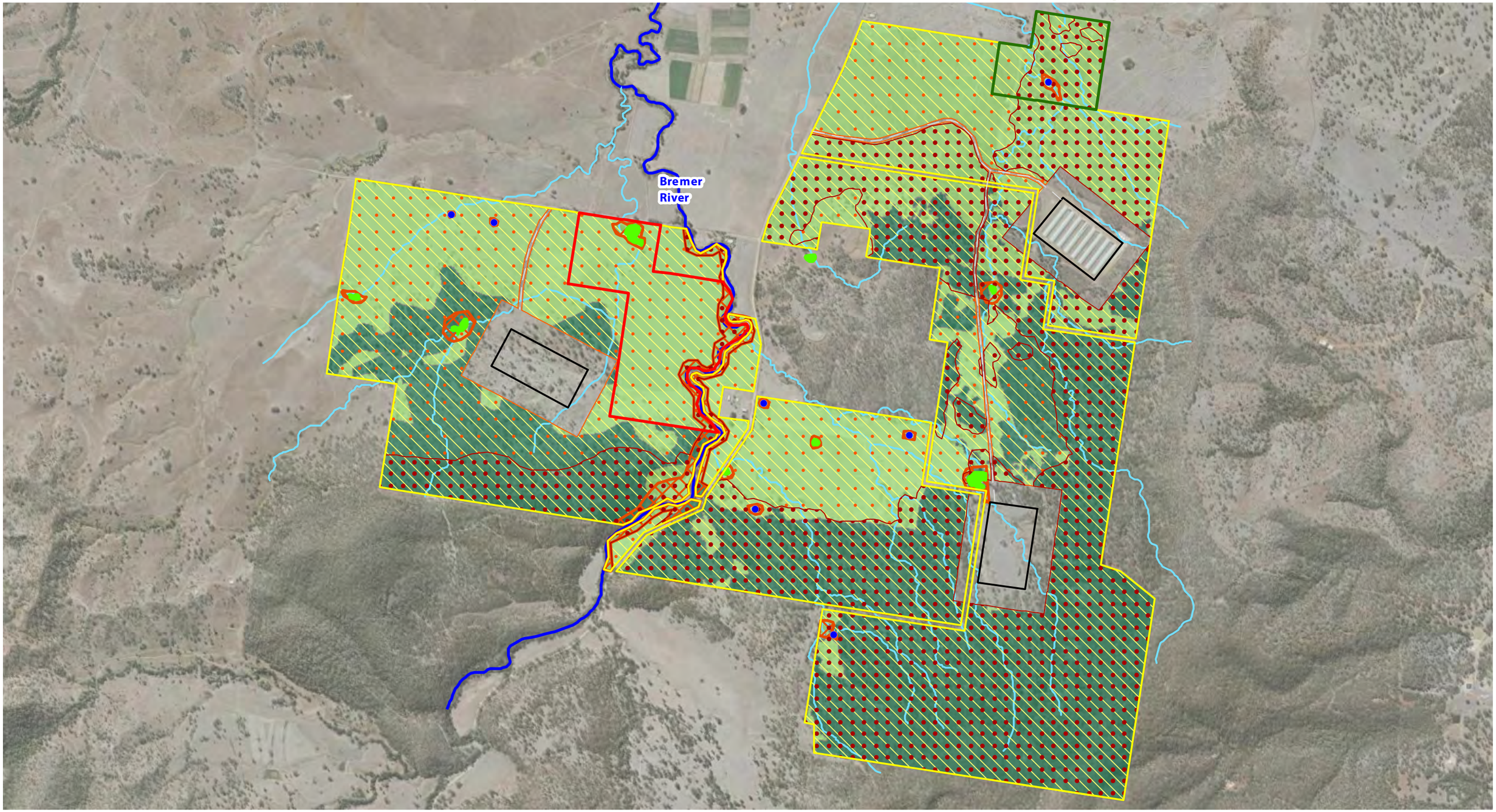
The following detailed information is included in the following sections:

- Management action justification;
- Management action location;
- Management action tasks and completion criteria;
- Management action risk reduction measures;
- Management action timing and preliminary completion criteria;
- Management action responsibility;
- Management action monitoring; and
- Management action risks and adaptive management.

Several proposed management activities relevant to habitat improvement will be undertaken across the entire Offset Property including feral animal control, weed management and land use management; whilst some more targeted actions will focus on specific areas within the proposed offset area (refer Plan 15).

A description of each of these proposed management measures and how they benefit MNES species is provided in Table 29. It should be noted that all management measures are to be completed across the entirety of the ROA 3.

15. Offset Area Preliminary Indicative Map of Proposed Management Actions



Montauban Environmental Offsets

1:17,000

0 100 200 300 400 m

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
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Project: Rosevale Offset Area 3

Date: 23/10/2025

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Legend

- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Chicken sheds
- Poultry shed access track

Water Resources

- Major Watercourse
- Creeks and Drainage Features
- Dams
- Reservoirs

- Feral Animal Control - Focal
- Feral Animal Control - General
- General Weed Management
- Significant Weed Management

- MNES Habitat Assisted Rehabilitation
- MNES Habitat Restoration

Table 48: Proposed management and mitigation measures for the relevant MNES

Justification	Proposed Action
Management Action 1 – Feral Animal Management	
Wild dogs, Feral Cats, and European Fox are considered direct threats to the MNES target species. This conclusion is based on several federal government documents including: • DCCEEW Conservation Advice for *Petauroides volans* (greater glider (southern and central)), • DCCEEW Conservation Advice for *Phascolarctos cinereus* (Koala) combined populations of Queensland, New South Wales and the Australian Capital Territory • Threatened Species Scientific Committee Conservation Advice for Swift Parrot (*Lathamus discolor*) and; • Department of Environment Threat Abatement Plans for Predation by Feral Cats, European Foxes and Feral Pigs.	Baseline pest monitoring has occurred (**Plan 14**) and will continue to occur in order to identify evidence of feral or unwanted pest with periodical surveys and monitoring of feral animal populations, locations and dispersal patterns within the Offset property. Survey methods to identify species presence include direct observation, remote sensor camera and sand traps for print record. These surveys will develop a baseline of feral animal populations, identify 'hot spots', and key activity periods (e.g. dusk). Due to their known impacts to Koala, Wild Dogs are considered the highest priority for control within the offset site. The baseline RAI of predator pest species (wild dogs and European red foxes) on site is therefore 1.79. The baseline RAI of herbivorous pest species (feral pigs) which have potential to damage MNES habitat is 1.02. This allows abundance of Wild Dogs within the offset property to be tracked and indicates whether management has decreased abundance.
Koala Feral animals including the wild dog are common in the proposed offset area and have the potential to impose negative pressures on the koala, with dogs representing a key mortality threat to koalas.	A purpose-built offset property Pest Management Action Plan will be developed specifying techniques to be utilised (trapping, shooting, baiting). Best-fit methods for control and monitoring of management programs will be guided by relevant threat abatement plan and recommended DAF Monitoring Techniques for Vertebrate Pests (Wild Dogs, Feral Cats and Foxes). In order to work effectively this approach will involve adaptive management to pest management, which considers each method relative to the base line data collected to determine the most effective pest management measures for the offset property.
Swift Parrot Predation of native wildlife by cats on the Swift Parrot is a listed threatening process under federal and state (NSW and Vic) legislation.	
Presence of foxes, wild dogs, and feral cats is an impact to all targeted MNES, with particular impact of wild dog on Koala, and feral cat and fox on Swift Parrot.	Where practical and appropriate; participate in pest management planning and stakeholder engagement with immediate land holders to foster joint sub regional scale action plan and ensure effective pest management in the locality of the offset area.

Justification	Proposed Action
	Key targets for this management action include: • Suppressing the occurrence of feral animal species (predators and herbivores) within the ROA 3. • Minimising MNES injury and mortality and impacts to regenerating MNES habitat to the greatest extent possible within the ROA 3 for the life of the offset.
Management Action 2 – Weeds of National Significance Control (reduction and management)	
The entirety of the Rosevale Offset Property was surveyed for weed presence with a focus on Weeds of National Significance (WONS) due to their known adverse impacts. Thirty-two (32) invasive species are identified by DCCEEW as weeds of national significance based on their invasiveness, potential for spread and identified socioeconomic and environmental impacts (Australian State of the Environment, 2021). Of the 32 WONS species, *Lantana camara* (Lantana), *Opuntia stricta* (Prickly Pear) and *Senecio madagascariensis* (Fireweed) were identified during walk overs of the Rosevale Offset Property. No weed species on the National Environmental Alert list were identified however several species declared under the *Scenic Rim Regional Council Planning Scheme*; *Sporobolus pyramidalis* (Giant Rat's Tail Grass), *Baccharis hamifolia* (Groundsel), *Senecio madagascariensis* (Fireweed), *Sporobolus africanus* (Parramatta Grass) and *Opuntia tomentosa* (Velvety Tree Pear). As well as two (2) potentially adverse invasives; *Celtis sinensis* (Chines Celtis), *Lantana montevidensis* (Creeping Lantana) and *Lantana camara* (Lantana). Although preliminary site surveys and observations over the Rosevale offset property recorded a number of weed species both federally and locally listed as well as general pastural invasive, the most prevalent and potentially impactful to MNES is Lantana camara (Lantana). The Department of Agriculture and Fisheries (2023) indicates more than 1400 native species are negatively affected by Lantana invasion, including many endangered and threatened species. This largely occurs through the suppressive effect of Lantanas aggressive growth form, generally adversely impacting species	Baseline weed monitoring utilising an Antenna based GPS system was conducted across the Offset Property which involved mapping the full extent (as description polygons) of all WONS, namely *Lantana camara*. This data will form the basis for targeted weed management activities across the site. As noted, the ROA 3 offset contains minimal weeds due to cropping and ploughing activities. However, where vegetation is present such as patches of regrowth, the understory contains Lantana. It is therefore a heightened risk that spread of Lantana will occur across ROA 3 once cropping and ploughing activities are ceased as a result of the offset. Therefore, the weed action management measure is largely to reduce current WONS infestations (Lantana, Velvety Tree Pear, Fireweed), prevent the spread of Lantana and manage general weed species that may inhibit growth of revegetation plantings. Following the exclusion of cattle and ceasing of ploughing and cropping, detailed weed management control activities within the ROA 3 will occur in accordance with the RMP (**Appendix F**) combining a range of management techniques from the SEQERF and other relevant guidelines (e.g. DAF, 2017, Gray et al. 2006). Post major weed removal operations, periodical weed maintenance rotations for removal / suppression of Lantana regeneration will occur with the same

Justification	Proposed Action
richness and some soil faunal assemblages, including many endangered and threatened species. This largely occurs through the suppressive effect of Lantanas aggressive growth form, generally adversely impacting species richness and some soil faunal assemblages. Additionally, in areas blanket layers of Lantana camara form a barrier to terrestrial species, which would include limiting the Koalas ability to access areas containing and over-canopy of NJKHTs. Further, as Lantana is a woody shrub with thin, combustible canes, it has been observed to create hotter bushfires, which significantly alters native vegetation communities and pastures (DAF, 2023). It is noted that under the Conservation Advice for Koala, increased intensity/frequency of bushfire is a listed key threatening process. Although this largely refers to the impacts caused by Climate Change, the presence of Lantana within bushland can significantly increase the extremity of bushfire and thus the impact it has directly on Koala and other listed species habitat; GHFF, Greater Glider, Regent Honeyeater and Swift Parrot all rely on Eucalypt bushland for foraging and breeding. For this reason, the Queensland Governments 'South East Queensland Koala Conservation Strategy 2022 – 2025' lists management of invasive weeds in both Action Area 1: Habitat Protection and Action Area 3: Threat Management (DES, 2020). Impact management of invasive flora, particularly Lantana, a Weed of National Significance (WoNS), is therefore considered a key direct action to addressing threats on Koala and other listed species that share the same habitat requirements. *Lantana camara* occurs on the Rosevale offset property both in open paddock areas as isolated clusters and thickets, as the dominant understory amongst regrowth and remnant vegetation and as a prolific shrub in gully lines. Within open areas existing farm practices result in periodical pesticide application limiting spread, however, this does not occur to the extent of entire eradication as the costs of treatment to result in an economical return for the grazing benefit are non-existent. Baseline weed data indicates WONS cover is relatively low ~10% of the ROA 3. The highly invasive and spreading nature of the species, coupled with the inactive management in areas	environmental considerations as the wholesale removing of weeds applied. Follow-up maintenance activities are to occur for a minimum of 2-5 years. As is the case with feral animal management plans, weed suppression activities incorporate adaptive management principles into weed management methods to streamline overall management to the most effective control types.

Justification	Proposed Action
would result in progressive increases particularly as local climatic events align with optimal germination and seeding periods. Within the ROA 3 offset, Lantana infestation is generally low due to the cropping land use and continued ploughing and re-seeding of the area with non-native grasses (**Plan 13**). Within regrowth vegetation at the southern extent of the site, Lantana is present in the understory. This evidences that as cropping use ceases as a result of the Offset and native plantings are established then preventing the encroachment of surrounding Lantana sources will be an ongoing challenge. Hence weed management being a priority management action in order to prevent impacts to Koala habitat and movement and GHFF foraging habitat. **Presence of WONS is an impact to all targeted MNES, particularly Koala.**	
Management Action 3 – Livestock Removal & Control and Cropping Discontinuation	
Livestock grazing is known to reduce the densities and biodiversity of flora species within a region, therefore reducing potential habitat for a wide range of fauna species. Although, there is some limited research that intensive cattle grazing can result in some positive biodiversity outcomes in regard to control of invasive species. However, for these conservation outcomes to be met it has been noted that a number of circumstances need to occur. For instance, stock must be controlled to graze areas needing treatment and excluded from sensitive wet areas where soil is most vulnerable to trampling. Stock must also be assured to be consuming the desired weed species and not native plant species intended for regeneration (Charles Sturt University, 2012). In general, clear treatment goals, control areas and monitoring programs need to be implemented for this system to work and the cost and benefits considered when compared to other weed treatments, such as slashing or burning. Overall, it is generally agreed that cattle farming has higher adverse effects to conservation rather than benefits due to re-engineering the landscape, removing potential for native species regrowth and ultimately supports predator species.	Cattle densities will be reduced from the offset area and fauna-fencing will be secured where required to prevent cattle entering the ROA 3. Areas with observed high localized grazing impacts, will be rehabilitated to re-establish native foraging and habitat trees for Koala and GHFF. Reinstatement of native vegetation layers will require a holistic management approach combining management of weeds and existing vegetation. Cropping and ploughing will be discontinued with the areas remediated for revegetation management. Key management actions to reduce the risk of livestock control and access and trespass management impacts on the Rosevale offset property include: • Ownership of the land by the offset provider and therefore any residual grazing or cropping activities will be secondary land uses to the approved offset outcomes.

Justification	Proposed Action
The offset area has been subject to varying levels of cattle grazing. This has degraded vegetation with native regrowth inhibited by trampling and feeding, therefore reducing the extent, connectivity and quality of foraging and breeding habitat for the targeted MNES within the offset area. Similarly, the area of ROA 3 currently utilised for cropping evidently inhibits potential native regrowth and therefore will be discontinued in order to allow for regrowth. Reduction of cattle densities, discontinuation of cropping, removal of fencing with a risk of entanglement to native fauna and replenishment of native species will increase habitat availability for Koala and GHFF. **Cattle grazing and ploughing activities are an impact to habitat for all targeted MNES habitat.**	• Implementation of a legally binding mechanism (Voluntary Declaration under the *Vegetation Management Act 1999*) which provides protection of existing and created habitat values. The Voluntary Declaration applies the regulations of the *Vegetation Management Act 1999* to the land title which remains regardless of the transfer of ownership or sale of the land; and • Fauna friendly livestock exclusion fencing around the perimeter of the ROA 3. • Reduction of barbwire fencing within ROA 3 in order to manage risk of native fauna entanglement.
Management Action 4 – Access and Trespass Management	
Unlawful access and trespassing can lead to impacts to native flora including trampling, compacting, and weed spread which ultimately leads to suppressing of native regrowth and potential habitat or connectivity vegetation for native species. Furthermore, trespassing often results in fence destruction, which allows for free movement of cattle, further impacting potential habitat for threatened species. **Access and trespassing have potential to impact habitat for all targeted MNES.**	The Rosevale offset property is surrounded to the north, east and west by large cattle grazing operations. The impacts of unlawful access and trespassing mimic those listed in the 'Livestock Control and Cropping Discontinuation' management action above (trampling, compacting, weed spread, fence destruction). Without a system for identifying and preventing or controlling access and trespassing the actions established for on-site stock management will be undermined.
Management Action 5 – MNES Habitat Restoration	
According to the relative statutory documents (i.e., conservation advice and national recovery plans), all 5 of the targeted MNES species referred to in this OMP are significantly impacted by habitat clearing and fragmentation.	MNES habitat restoration will occur through the transitioning of grassed grazing areas (ROA 3) into vegetated ecosystems supporting habitat for the koala. In total 41.3 ha ha is proposed for MNES habitat reconstruction. This will increase foraging habitat for



Justification	Proposed Action
The ROA 3 site consists of open paddocks and dead plantation trees, designated as non-remnant and regrowth which has been assessed throughout the report as two assessment units (AUs). The majority of ROA 3 is flat land with one constructed dam within the north which contains a mapped drainage feature. Currently habitat values within ROA 3 are significantly limited with only scattered large trees in the north where the drainage feature runs and along the southern boundary where the offset site adjoins regrowth and mapped core Koala Habitat Area (KHA). On-ground delineation of vegetation characteristics was able to categorise the offset area into two assessment units containing non-remnant (AU-1) vegetation (37.9 ha) and regrowth vegetation (3.4 ha) (Plan 10). In its current state these areas offer minimal in the way of direct foraging or breeding habitat for Koala or GHFF, with only scattered vegetation at the southern extent of ROA 3. Therefore, current vegetation is not great enough to provide significant steppingstone habitat. Thus, restoration and assisted rehabilitation of these areas will provide a significant area of new habitat for these species and improve safe movement opportunities for fauna. Rehabilitation activity on-site will contribute to functional ecological habitat and corridors due to the surrounding landscape containing known and potential habitat for both Koala and GHFF. Koala The Koala has a specialist diet, feeding on the leaves of select species of *Eucalyptus, Lophostemon, Corymbia, Angophora* and occasionally *Melaleuca* and *Leptospermum*. Consequently, koalas are reliant on access to stands of forest and woodland that support those key food-tree species. Habitat protection and habitat restoration are Action Areas 1 and 2 respectively within the South East Queensland Koala Conservation Strategy 2020 – 2025. Rehabilitation therefore a key action that will improve koala habitat values within the offset area. Specifically, reinstating the natural RE communities has the potential to	MNES within 20 year via planting out the entire offset area, mapped currently as non-remnant, with non-juvenile Koala habitat trees and allowing regrowth to naturally regenerate. The rehabilitation program will be undertaken by suitably qualified personnel and will include measures to ensure the maintenance and survival of new breeding and foraging trees in the offset areas. Restoration is a high cost and high labor-intensive task from preparation to commencement through to the first 5 years of establishment. Only planning and preparation works are proposed within year 1 of the offset while beginning communication with a local nursery for stock will be conducted. All rehabilitation planting is to be completed by the end of Year 2. All revegetation and planting species are to be in accordance with the technical regional ecosystem description and a Rehabilitation Management Plan. This staged process of rehabilitation is recommended under the SEQ Restoration Framework Manual (Chenoweth EPLA, 2012) and SER Australasia National Restoration Standards (SERA, 2017). Under these guidelines it is suggested that larger sites be broken into a number of different management zones with progress occurring at different stages within each zone. Therefore, allowing for each zone to get the same amount of care and management practices. As these zones move to maintenance and the time required for each zone is reduced these can be consolidated. Additionally, the Victorian Government Department of Sustainability and Environment Native Vegetation Revegetation Planting Standards (DSE, 2006) indicates that staged or successive plantings which result in more than one age class allows for better natural recruitment, higher vegetation complexity and easier adaptive management.

Justification	Proposed Action
increase habitat connectivity and increase the availability of key resources including food and shelter trees for the koala. **Grey-headed Flying-Fox** Grey-headed Flying-fox requires foraging resources and roosting sites to persist. The species is known to feed primarily on the nectar and pollen in eucalypt flowers and fleshy subtropical rainforest fruits, and around 100 species of plant have been recorded in their diet. Under the National Recovery Plan for GHFF, recovery objective 1 lists enhancing and rehabilitating native vegetation on public and private lands as a way to increase foraging habitat critical to the species survival. Rehabilitation is therefore a key action that will improve GHFF foraging values within the offset area. **Regent Honeyeater** 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. Nectar is obtained chiefly from eucalypts and mistletoe, and regent honeyeaters appear reliant on select species which provide reliable nectar flows. Strategy 1 of the National Recovery Plan for Regent Honeyeater is focused on improving the extent and quality of habitat for this species. Rehabilitation of degraded areas were foraging habitat was once present and likely formally used by Regent Honeyeater, as indicated by surrounding habitat and pre-clear vegetation, is therefore a key action that will improve Regent Honeyeater foraging values within the offset area.	Benchmarks for rehabilitation efforts are derived from the definition of remnant vegetation under the *Vegetation Management Act 1999*. Vegetation can be mapped as remnant vegetation and associated essential habitat for Koalas if the canopy is 70% of the height, 50% of the cover and similar species composition of the appropriate pre-clearing RE (Queensland Government 2015). Therefore, the final benchmark at 20 years for rehabilitation is 70% of the reference benchmark cover (for canopy, shrub and ground-layer) and 50% of the reference benchmark height (for canopy and shrub layer) of the appropriate RE. All revegetation and planting species are to be in accordance with the technical regional ecosystem for the dominant RE being RE12.3.3, RE12.8.17 with elements of RE 12.8.14. The Queensland Herbarium descriptions are provided below: • RE 12.3.3 is described as: Eucalyptus tereticornis woodland. Eucalyptus crebra and E. moluccana are sometimes present and may be relatively abundant in places, especially on edges of plains and higher level alluvium. Other species that may be present as scattered individuals or clumps include Angophora subvelutina or A. floribunda, Corymbia clarksoniana, C. intermedia, C. tessellaris, Lophostemon suaveolens and E. melanophloia. Occurs on Quaternary alluvial plains, terraces and fans where rainfall is usually less than 1000mm/y. Not a Wetland. (BVG1M: 16c). • RE 12.8.17 is described as: Mixed woodland with combinations of Eucalyptus crebra, E. melanophloia, E. tereticornis, Corymbia tessellaris, C. intermedia, and commonly containing Angophora subvelutina and E. melliodora, with a grassy ground layer. Usually occurs on mid and lower slopes of hills on Cainozoic igneous rocks, especially basalt. Not a Wetland. (BVG1M: 11a). • RE 12.8.14 is described as: Eucalyptus eugenioides, E. biturbinata, E melliodora +/- E. tereticornis, Corymbia intermedia, E. crebra open forest Allocasuarina torulosa is a common understorey species. Localised occurrences of Eucalyptus laevopinea, E. quadrangulata and E. banksii may occur. Occurs on Cainozoic igneous rocks, especially basalt. Not a Wetland (BVG1M: 11a).

Justification	Proposed Action
Swift Parrot Swift Parrots breed in Tasmania and then move to mainland Australia in Autumn for the non-breeding season. They feed preferentially in the largest trees available (Kennedy and Overs, 2001) and on psyllid lerps, seeds and fruit (Kennedy and Tzaros, 2005). Favored feed trees include winter flowering species such as Swamp Mahogany (*Eucalyptus robusta*), Spotted Gum (*Corymbia citriodora*), Red Bloodwood (*C. gummifera*), Forest Red Gum (*E. tereticornis*), Mugga Ironbark (*E. sideroxylon*), and White Box (*E. albens*). Swift Parrots are known to utilise similar foraging habitat vegetation to GHFF (Birds Australia, 2011), therefore providing new habitat for GHFF also benefits Swift Parrots. **Restoration efforts will provide foraging and dispersal habitat for all MNES species.**	The Queensland Herbarium BioCondition benchmarks (v3.6) for regional ecosystem RE12.3.3 indicate a benchmark for remnant canopy tree height as 25 m and 9 m for subcanopy, remnant tree canopy coverage as 40% and subcanopy coverage as 8%. RE 12.8.17 has a benchmark for remnant canopy tree height of 19 m and 10 m for subcanopy, and the remnant tree canopy coverage is 48% with sub-canopy coverage as 20% and shrub canopy coverage as 5%. Therefore, once the AU1 and AU2 reach 70% of these prescribed heights and 50% of these prescribed canopy coverages it can be considered remnant. The rehabilitation planting will be completed to reflect the mapped dominant pre-clear regional ecosystem on-site RE12.3.3 and RE 12.8.17 with elements of RE 12.8.14 via incorporating the following eucalypt species into revegetation: • *Eucalyptus melliodora* (Yellow Box) • *Eucalyptus eugenioides* (Thin-leaved Stringybark) • *Eucalyptus crebra* (Narrow-leaved Ironbark) • *Eucalyptus melanophloia* (Silver-leaved Ironbark) • *Eucalyptus tereticornis* (Forest Red Gum) • *Corymbia tessellaris* (Moreton Bay Ash) • *Corymbia intermedia* (Pink Bloodwood) • *Angophora subvelutina* (Rough-barked Apple) Of the above, *E. melliodora* and *E. eugenioides* are identified as foraging trees for the regent honeyeater and swift parrot with *E. tereticornis* as a foraging species for the swift parrot only. Planting will occur in accordance with the prescribed methodology in the RMP with a higher number of trees to be planted within EMZ 1. Within particularly disturbed areas of non-remnant vegetation, the objectives of this plan are long term and may take longer than 15 years after commencement of implementation, particularly as the Queensland Herbarium quotes that in general it takes 30 years for a disturbed site to regain remnant status. However, the goal of regeneration actions are often to re-establish an ecosystem to a point where it is self-

Justification	Proposed Action
	sustaining and able resilient to disturbance (Chenoweth EPLA, 2012). The SEQERF indicates that in order to achieve the self-sustaining ecosystem at least 2-5 years of implementation and maintenance needs to occur. Thus, the offset project provides a sufficient maintenance and implementation period which sets the revegetation areas towards remnant status following the completion of maintenance. Interim benchmarks via MHQA transects are to be conducted at regular intervals which will inform the progress of the rehabilitation/revegetation efforts towards achieving this plan's outcomes. Given this, adaptive management approaches can also be employed to redirect restoration approaches, if interim benchmarks are not being met. The aim to plant vegetation by the end of Year 2 is not anticipated to impact the conservation benefits or outcomes of the restoration efforts by Year 20. Several studies on the benefits of revegetation, including one from La Trobe University in association with the Victorian State Governments Department of Energy, Environment and Climate Action (DEECA), have indicated that the benefits of revegetation are realized within the first 15 years of planting, particularly for bird and nectar foraging species (DEECA, 2020). This study in particular accredits the success of revegetation to a well-thought-out monitoring program and species selection, which is intended for ROA 3. A range of monitoring techniques are proposed as part of the offset program to allow for an effective monitoring regime that will promote adaptive management and high achieving offset outcomes. This includes methods prescribed under the RMP and habitat quality monitoring methods under the OMP.
Management Action 6 – Bushfire Management	
Uncontrolled wildfire is considered a key threat to Koala populations with impacts ranging from mortality and injury to loss or altered habitat resulting in a reduction in food source and in some cases increased exposure to predators. The purpose of management actions is centred on reducing the risk and severity of bushfires that may occur within the ROA 3 to prevent immediate impacts on Koala and MNES habitat and long-term through impacts to restoration activities.	Management actions to reduce the risk of bushfire impacts within ROA 3 include: • Maintain existing bushfire breaks between adjacent landholders, in particular along the boundaries where the State Planning Policy bushfire hazard mapping indicates there is a 'high' or 'very high' risk of bushfire occurring;

Justification	Proposed Action
	• Cooperate with the local Queensland rural fire service, Scenic Rim Regional Council and adjoining land owners to minimise bushfire risk at a regional scale; and • Undertake a feasibility assessment on insurance for plant stock replacement.

ACTION 1: FERAL ANIMAL MANAGEMENT

MANAGEMENT ACTION JUSTIFICATION

A core role of management action 1 will be for the ongoing control and reduction in identified primary pest species know to be a direct threat to listed MNES, namely wild dogs with a secondary focus on European Foxes, and Feral Cat over the Rosevale offset property for the offset period. Other pest species, which have indirect impacts on the ecosystems that support the MNES species, should be managed as seen fit in order to reduce their impact to rehabilitation efforts. This includes non-native vertebrate pest species being the feral pig, European rabbit and feral Rusa Deer identified on-site, all of which are known to damage native vegetation, spread weed seeds and foul water. Refer to **Figure 12** for non-native feral animals requiring prioritisation.

Fauna surveys were conducted within the broader offset property to determine the presence of pest species, with a particular focus on wild dogs due to their known threat to Koala. Motion sensor cameras were deployed across the entire proposed Rosevale Offset Property in order to provide broad baseline data. Focus was given to existing tracks and animals trails and the eastern portion of the offset property where existing chicken sheds are present as the Department identified concerns with the presence of this practice within the property in terms of pest management.

In July 2024, the SRRC adopted the Scenic Rim Region Biosecurity Plan 2023–2028. This five-year overarching strategy outlines renewed targets and priorities for how the region will meet its responsibilities under the *Biosecurity Act 2014* by strengthening coordination, community participation, awareness and enforcement to minimise threats from feral animals.

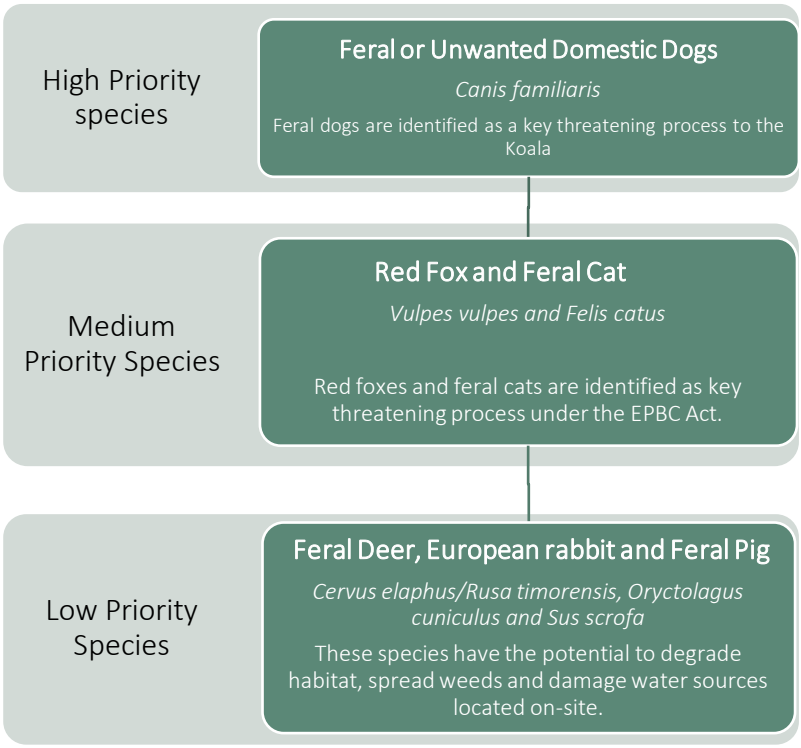


Figure 12: Feral Animal Management Prioritisation

Wild Dogs

The Department of Agriculture and Fisheries (DAF) lists feral dogs as abundant and widespread throughout the Scenic Rim region. Wild dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) are listed as declared pest animals by Scenic Rim Regional Council, with the local council website documenting that the impact of wild dog activity has increased in the past 10 years due mainly to the increasing population in the region. Further, residents are increasingly engaged in raising livestock and poultry, resulting in a readily available food sources for wild dogs (SRRC, 2021). The Scenic Rim Regional Council currently runs baiting, shooting and trapping programs throughout the region. Most wild dog baiting uses meat baits infused with sodium fluoroacetate, commonly called 1080; an environmentally responsible option for invasive species control due to its minimal impact on native animals (NWDAP, 2020). Dogs and foxes are highly susceptible to 1080, and the small amount required to target these species poses a minimal threat to non-target species.

Property-wide baseline survey results identified nine (9) dogs during the survey period. A total of fourteen (14) cameras were been throughout this period which equates to a total of seven hundred and seventy-eight (778) camera nights. The total RAI of wild dogs within the property is calculated as 1.16.

European Fox

European Fox is listed as a major threat to the survival of several of the listed species Conservation Advice. DAF lists foxes as being widespread across Australia due to being highly adaptable and opportunistic feeders. Scenic Rim Regional Council also lists this species as being abundant throughout the region, with trapping programs widely conducted (SRRC, 2023d). The Australian Government's 2022-2023 Threatened Species Action Plan includes targets to manage foxes in important habitats for threatened species. The Queensland Government sites several control methods for this species, including shooting, trapping, fencing, baiting, and livestock guardian dogs, combined with land management (Business Queensland, 2021) (refer Table 28). Evidence of European Fox was recorded on the offset property. Under SRRCs Biodiversity Strategy 2015 – 2025 local council has set forth an objective to support land managers in the control of pest animals, including foxes and cats. Indicating the acknowledgement that these pest species are currently a problem in the region.

Feral Cats

The DCCEEW state that feral cats pose a significant threat to many nationally listed threatened species. This species is known to predate on native species, spread diseases and reduce viable habitat for species most at risk. It is recorded that they are a threat to more than 120 nationally listed threatened species, including Greater Glider and Swift Parrot, and have been implicated in 28 mammal extinctions (DCCEEW, 2023). For this reason, predation by feral cats has been listed as a Key Threatening Process (KTP) under the *Environment Protection and Biodiversity Conservation Act 1999*. Scenic Rim Regional Council declare feral cats as a pest animal within the area with it noted that they are scattered throughout the region and trapping is an on-going activity. Feral cats were not captured on the infrared cameras places on-site; however, scats have been recorded and the presence of the poultry farms indicate it is likely this pest species is present within the area. Additionally, research from the National Land & Water Resources Audit, Canberra indicates that feral cat occurrence, abundance and distribution within south-east Queensland is "common/widespread."

The Australian Government's 2022-2023 *Threatened Species Action Plan* highlights that in order to tackle the impacts of feral cats' engagement and collaboration from the Australian Government with private and agricultural sectors is necessary. Therefore, the proposal to implement feral cat and fox management for this

project, into a large area of potential threatened species habitat corresponds with both local and federal government objectives concerning the species. Feral Cat control tools currently available include shooting, trapping, fencing, baiting and grooming traps. DCCEEW indicate that the most effective form of feral cat control over large areas is poison baiting.

Feral Pig

Feral pigs (*Sus scrofa*) are opportunistic omnivores and will consume a wide range of animals including small mammals and birds. Feral Pigs are also widely known to cause significant environmental destruction to soil and vegetation via digging, spreading weeds and consuming vegetation.

According to the SRRC website (SRRC, 2023b), feral pigs are found mostly in isolated areas and trapping is conducted when reported sightings are received. Within the region, Feral Pig populations have increased due to increased animal husbandry, and availability of food sources such as feed lots and the feeding of livestock like horses on rural residential blocks. Following identification of feral pig activity, trapping programs are initiated with varied success rates ranging from 100% removal to dispersal and subsequent reduction in feral pig numbers.

Feral pigs were confirmed to occur within the broader offset property during property-wide baseline camera monitoring and present a threat to the proposed habitat restoration.

Feral Deer

Feral deer such as Red deer (*Cervus elaphus*) and Rusa deer (*Rusa timorensis*) pose significant threats to ecological restoration through their browsing of seedlings and under-storey plants, ring-barking and bark-stripping of young trees, trampling of regenerating vegetation and disturbance of soil through wallowing or hard-hoofed movement. These behaviours reduce vegetation recruitment, alter species composition and degrade habitat structure; moreover, the soil disturbance they cause can create bare patches that facilitate invasive weeds, undermining restoration efforts. Ecological restoration therefore faces a heightened risk of failure if deer populations are unmanaged, particularly in planting or natural regeneration areas where plant establishment is critical.

The Scenic Rim Biosecurity Plan 2023-2038 recognises the Council and landholders' responsibility under the Queensland *Biosecurity Act 2014* and emphasises the shared General Biosecurity Obligation to minimise the impact of invasive animals, including feral deer.

While specific site-based case studies for red deer or rusa deer within the region are limited in public documentation, national research and regional control programs in SEQ indicate that rusa deer can maintain home-ranges of a few hundred hectares in peri-urban and bushland fringe settings (making them locally manageable) and hence pose a realistic threat to restoration success within ROA 3.

Current Biosecurity Obligations

Presently, under the *Biosecurity Act 2014*, there is the General Biodiversity Obligation (GBO) for landholders to manage biosecurity risks that are under their control and take reasonable and practical steps in doing so. To determine the extent of management and to determine if it is necessary to take reasonable and practical steps in managing the biosecurity risk, the landholder is required to assess the risk and its potential harm (i.e., extensive productivity loss). Currently, the landholder does not undertake feral animal control as it is assessed

under the 'general biosecurity obligation' of the Biosecurity Act 2014, that feral animal threat to productivity does not have a positive cost benefit to the current land use (i.e., the expenditure to undertake feral animal control would not result in enough economic gain in productivity to warrant implementation).

Biosecurity control and pest management surrounding poultry production is generally focused on preventing or minimising the introduction and spread of an infectious disease and food safety pathogens. Biosecurity management is conducted under a biosecurity or pest management program. Pest animal control is often localised to prevention of feral animals entering the poultry sheds and coming in contact with the fowl, with localised baiting often utilised (Business Queensland, 2022). Therefore, the control of pest species such as feral cat, dogs and foxes is likely not actively occurring if it is cheaper to provide preventative measures excluding their entry rather than active management (shooting, trapping, monitoring). Therefore, feral animals sighted throughout the offset property are likely not actively managed unless within proximity to the poultry sheds. It is therefore ultimately a requirement that pest management occur across a broader area to abate and manage these species and prevent associated impacts to native fauna and flora. The implementation of a targeted Pest Management Program for the offset site, which liaises with surrounding landholders, will provide certain, detailed, and active reduction of pest species in the local area.

PROPOSED ACTION

A dedicated Pest Management Program (PMP) is proposed to manage non-native vertebrate pest species within the ROA 3. Key management measures for the control of feral or unwanted domestic dogs and other identified invasive species across the offset areas include:

- A property wide feral animal management program specifying techniques (trapping, baiting, shooting) to be utilised will be completed within 12 months of the approval decision. Where possible and practicable, adjacent land holders will be consulted for the potential of collaboration in a localised landscape-wide pest management effort. As vertebrate pest management is best achieved on a wide scale, this will occur across adjacent offset holdings at a minimum.
- Annual pest monitoring by a suitably qualified person, with evidence of pest animals GPS recorded.
- Stratified camera trap monitoring to implement directed animal control when pests are recorded.
- Cooperative participation in pest management planning and implementation with local land managers (government departments, local governments and utility providers) to ensure effective pest management in the locality of the offset areas.
- Installation of signage at access points to inform any persons interacting with the area of feral animal control being undertaken within the ROA 3.

The following structured approach ensures scientific integrity, regulatory compliance, and ongoing accountability in managing vertebrate pest species within the offset area.

1. Baseline monitoring to establish pest animal presence and levels of activity.
2. Biannual monitoring and control of pest animals as outlined above for the offset period.
3. Dedicated annual and 5-yearly reporting for inclusion in the Annual Compliance Report.
4. Adaptive management to ensure best control outcomes.

The Pest Management Program is to occur across the entire offset area, with potential focus areas of highest activity that are identified by the appointed pest expert to be implemented.

Refer to Table 49 for the non-native pest control actions proposed.

Table 49: Non-native Pest Control Actions

Item	Details
Proposed Action	Year 1: Offset Area-specific Detailed Monitoring Programme 1. Remote sensor camera deployment as per the National Wild Dog Action Plan and the Queensland Wild Dog Management Strategy. a. Camera deployment within the offset area to be a minimum of 22 nights biannually (summer and winter seasons). b. Cameras to be placed in fauna through-way locations for optimal pest detection, including existing farm tracks, fauna trails and water bodies. c. Motion detection camera locations are to be recorded with hand-held GPS units. d. GPS coordinates and photos to be recorded and mapped for annual reporting. e. Monitoring locations to be fixed and repeated. f. Consistent timing and effort for monitoring must be applied across monitoring events. g. All incidental observations of pest species are to be recorded and included in reporting. h. Reporting must include a count of species recorded. i. Target pest species (herbivores and predators) for monitoring and control include but are not limited to: i. Dogs ii. Foxes iii. Cats iv. Pigs v. Goats vi. Deer 2. Field survey datasheets will detail the time of year of the monitoring event, record observed scats or tracks, photo locations and notes of any evidence of positive and/or negative changes in pest occurrence. 3. Transfer GPS data to spatial data programs to generate pest occurrences and collate all data in excel spreadsheets and save all digital photos to file for ongoing monitoring and reporting purposes. 4. Where pest presence is detected, targeted control programs will be implemented on completion of the monitoring. The collected data will inform locations for intensive control efforts outlined below. 5. The Pest Management Plan will use the baseline data to build a calendar of annual activities based around varying control methods, seasons and species recorded.

Item	Details
	Year 1 – Develop a targeted Pest Management Plan A targeted Pest Management Plan specifying techniques to be utilised (trapping, shooting, baiting) will be prepared by a suitably qualified pest management contractor. Best-fit methods for control and monitoring of management programs will be guided by relevant threat abatement plan and recommended DAF Monitoring Techniques for Vertebrate Pests (Wild Dogs, Feral Cats and Foxes). To work effectively this approach will involve adaptive management to pest management, which considers each method relative to the base line data collected to determine the most effective pest management measures for the offset property. Preliminary details are provided below. 1. Best practice management measures will be implemented, and will include for: a. Dogs – biannual control (Mar-May breeding and Sep-Nov weening) i. Shooting – dawn ii. Cage trap – set evening, clear morning iii. Foothold / padded-jaw / offset laminated jaw traps – set evening, clear morning iv. Leg hold trap – set evening, clear morning v. Collarum® neck restraint – set evening, clear morning vi. Baiting with / without infra-red sensing cameras – set as required b. Foxes – biannual control (winter/spring breeding and autumn migration) i. Shooting – dawn ii. Cage trap – set evening, clear morning iii. Padded-jaw / offset laminated jaw traps – set evening, clear morning iv. Leg hold trap – set evening, clear morning v. Baiting with / without infra-red sensing cameras – set as required c. Cats – biannual control i. Shooting – nocturnal more productive ii. Wire 'treadle-type' box traps – baited and set evening, clear morning iii. Rubber-jawed leg-hold traps - baited iv. Baiting with / without infra-red sensing cameras – set as required d. Pigs – annual control targeting ≥ 70% of population i. Shooting – outside of trapping and baiting ii. Fenced trapping - set evening, clear morning – pre-feeding and then triggered iii. Baiting with / without infra-red sensing cameras – set as required – can pre-feed to attract e. Goats – annual control targeting ≥ 35% of population i. Mustering – diurnal ii. Shooting – diurnal

Item	Details
	iii. Fenced trapping – water source attractant and one-way gate iv. Judas collar – should other control measures fail f. Deer – manage in response to an incursion i. Shooting – diurnal v. Self-mustering trap - set evening, clear morning and euthanise Years 2-20: Intensive Pest Management 2. Implement the Pest Management Plan, based on a calendar of activities around ongoing biannual monitoring, varying control methods, seasons and species recorded. 3. Adapt methods and locations as needed based on outcomes of the ongoing management plan according to a defined set of criteria. 4. Report annually on methods implemented and results of management techniques as part of Annual Compliance Reporting. Year 5: Compile findings in a Milestone Report of five years of the Pest Management Program (as outlined below). Year 10: Compile findings in a Milestone Report of ten years of the Pest Management Program (as outlined below). Year 15: Compile findings in a Milestone Report of fifteen years of the Pest Management Program (as outlined below). Year 20: Compile findings in a Milestone Report of twenty years of the Pest Management Program (as outlined below).

MANAGEMENT ACTION COMPLETION CRITERIA

Timing	Completion Criteria
Year 1	Complete offset area-specific baseline pest monitoring to supplement property-wide data.
Year 2 – 20	Implement the Pest Management Program to ensure: • Suppression of feral animal species (predators and herbivores) and their impacts within the ROA 3. • Minimise MNES injury and mortality to the greatest extent possible within the ROA 3 for the life of the offset.
Years 5, 10, 15	Complete review of PMP based on available data and endorsed guidelines and including a review of management techniques and adaptive management strategies where appropriate.

MANAGEMENT ACTION RESPONSIBILITY

The Offset Provider is responsible for establishing, funding, and resourcing the Pest Management Program. To ensure effective implementation, the following are required:

1. Detailed Pest Surveys: Offset Area-specific baseline and ongoing targeted surveys must be conducted by a suitably qualified pest management practitioner or suitably qualified Ecologist.
2. All contractors for all pest control measures will be suitably qualified.
3. Pest control contractors will be responsible for the upkeep of appropriate training for all pest control staff.
4. Pest control contractors will be responsible for the data collection and upkeep of all pest control and monitoring data and provide the data to the proponent when available and required for reporting annually and in 5-yearly summaries of previous outcomes.
5. Lethal controls will consist of best practice management measures as outlined.

MANAGEMENT ACTION MONITORING

The effectiveness of pest management actions will be measured and monitored through a structured process:

1. Detailed Offset Area-specific Baseline Survey (Year 1) – Establishes initial pest population data and report.
2. Annual scheduled Pest Surveys and Control (Years 2–20) reported.
3. Progressive reporting will consist of annual reports and also 5-yearly summaries of previous pest management outcomes.
4. Annual Compliance Reports – Each survey's findings and pest management outcomes etc. will be included in the annual and 5-yearly reporting to be adopted into Annual Compliance Reports.

A suitably qualified person will complete monitoring for non-native vertebrate pests before the end of Years 5, 10, 15 and 20 of the offset with the aim of demonstrating a reduction in:

- Incidental sighting and records of feral animals on-site (at or below the baseline survey results for Wild Dogs);
- Feral animal scat / track or imprint evidence at targeted survey locations;
- Site population census on infrared drone and baited remote sensor camera surveys;
- Scalp collection or animal kills on diurnal hunting (Shooting) events;
- Stock losses over the property; and
- Occurrence of injury or mortality on MNES attributed to vertebrate pest species.

The following non-native predator monitoring methodology will be implemented by a suitably qualified person in accordance with the baseline survey methodology detailed in Section 5:

- Desktop Assessment
    - Review previous survey mapping and camera locations, field datasheets, photos and notes.
- Field Survey

- Grid-based motion detection camera deployment for minimum of 22 nights within the offset area at Years 5, 10, 15 and 20. Motion detection camera locations are to be recorded with hand-held GPS. GPS coordinates and photos to be recorded. New camera monitoring locations will be established during Year 1 of the offset within the offset area to enable the collection of offset area-specific data to be repeated for the life of the offset.
- Field datasheet will detail the time of year of the monitoring event, record observed scats or tracks, photo location and notes of any evidence of positive and/or negative changes in non-native predator occurrence.
- A GPS will be used to locate the presence of non-native predator species, with a focus on species identified during baseline field surveys via notable tracks or scats.
- Transfer GPS data to spatial data programs to generate non-native predator occurrences and collate all data in excel spreadsheets and save all digital photos to file for ongoing monitoring and reporting purposes.
- Where non-native predator presence is detected, targeted trapping and baiting programs will be triggered.

MANAGEMENT ACTION REPORTING

- Milestone pest monitoring survey results will be reported by the suitably qualified person in the 5, 10, 15 and 20 Year Milestone Report. This will provide detail on survey methodologies and detected predator abundance with reference to the baseline survey data.
- Implementation of the Pest Management Program and results of pest management program will be detailed annually by the Offset Provider in Offset Area Annual Reports.
- OAARs and/or Milestone Reports will be included in the relevant Annual Compliance Report.

MANAGEMENT ACTION RISKS AND ADAPTIVE MANAGEMENT

Without intervention and active management, the risk of feral animal impacts on MNES and their habitat are assessed as 'high' (refer Section 9). This is based on regional and local government data on feral animals combined with evidence of livestock predation recorded on-site and an abundance of research in the surrounding area indicating the prevalence of feral dogs, European fox and feral cats. The pest management strategies incorporate intensive implementation methods and three major data collection survey events for confirming base case and successful reduction of pest management impacts.

The PMP will use a combination of pest management monitoring data collected from pest management contractors and monitoring data collected through annual or 5-yearly surveys to inform site management. Major survey and review periods for review of the OMP are set at Years 5, 10 and 15 to ensure the program achieves long-term reduction and does not respond to specific stochastic events such a contextual fluctuation in pest populations such as wild dogs.

Triggers for adaptive management include:

1. Following positive records from pest monitoring, implemented control efforts do not yield expected pest animal kills.
2. Feral animals are recorded during scheduled monitoring post-control efforts.
3. Opportunistic observations of feral animal activity, including sightings of animals, their tracks or scats during general offset site management works.

Adaptive management measures include:

1. Spatially and temporally expanding monitoring efforts (i.e., more sites, more often in more locations) to ensure greater site coverage.
2. Increasing frequency of monitoring and control events relevant to target species beyond existing events outlined earlier.
3. Sporadic controls triggered by ad hoc pest animal sightings, including pest species additional to those detected and identified as target species for pest management upon completion of baseline pest surveys.
4. Working more closely with adjoining land holders on landscape scale controls.
5. Applying multiple control measures in unison to improve control efficacy.

If monitoring data indicate that the PMP is not meeting its timing, responsibility, monitoring and control targets, the Program will be adjusted using the following strategies:

1. Spatially and temporally expanding monitoring efforts (i.e., more sites, more often in more locations) to ensure greater site coverage.
2. Increasing frequency of monitoring and control events beyond those outlined above.
3. Sporadic controls triggered by ad hoc pest animal sightings, including pest species additional to those detected and identified as target species for pest management upon completion of baseline pest surveys.
4. Working more closely with adjoining land holders on landscape scale controls.
5. Applying multiple control measures in unison to improve control efficacy.
6. Review responsibility where lapsed and advise alternative roles and / or personnel.

This adaptive management approach ensures regulatory compliance, continuous improvement, long-term effectiveness, and alignment with broader conservation and threat abatement goals.

ACTION 2: WEEDS OF NATIONAL SIGNIFICANCE MANAGEMENT

MANAGEMENT ACTION JUSTIFICATION

Preliminary site surveys and observations over the Rosevale offset property recorded a number of weed species, with the most prevalent and inhibitive to Koala movement and habitat restoration being *Lantana camara*. The Department of Agriculture and Fisheries (2023) indicates more than 1400 native species are negatively affected by Lantana invasion, including many endangered and threatened species. This largely occurs through the suppressive effect of Lantanas aggressive growth form, generally adversely impacting species richness and some soil faunal assemblages.

Lantana infestations suppress and inhibit the natural regeneration of regrowth vegetation on-site which directly limits the growth rates and regeneration of non-juvenile koala habitat trees and other species that forage and inhabit these (GHFF, Greater Glider, Regent Honeyeater and Swift Parrot). Additionally, in areas blanket layers of *Lantana camara* form a barrier to terrestrial species, which would include limiting the Koalas ability to access areas containing and over-canopy of NJKHTs. Further, as Lantana is a woody shrub with thin, combustible canes, it has been observed to create hotter bushfires, which significantly alters native vegetation communities and pastures (DAF, 2023). It is noted that under the Conservation Advice for Koala, increased intensity/frequency of bushfire is a listed key threatening process. Although this largely refers to the impacts caused by Climate Change, the presence of Lantana within bushland can significantly increase the extremity of bushfire and thus the impact it has directly on Koala and other listed species habitat; GHFF, Regent Honeyeater and Swift Parrot all rely on eucalypt bushland for foraging. For this reason, the Queensland Governments 'South East Queensland Koala Conservation Strategy 2022 – 2025' lists management of invasive weeds in both Action Area 1: Habitat Protection and Action Area 3: Threat Management (DES, 2020). Impact management of invasive flora, particularly Lantana, a Weed of National Significance (WONS), is therefore considered a key direct action to addressing threats on Koala and other listed species that share the same habitat requirements.

Lantana camara occurs within the ROA 3 both in open paddock areas as isolated clusters and thickets (Photo Plate 7), as the dominant understorey amongst regrowth and remnant vegetation and as a prolific shrub in gully lines. As ROA 3 has been historically cleared and currently used for cropping and cattle grazing WONS are relatively low ~10% on average across the majority of the open paddock area. The highly invasive and spreading nature of the species, coupled with the inactive management in areas would result in progressive increases particularly as local climatic events align with optimal germination and seeding periods. Therefore, once ploughing and cropping activities are discontinued there is a high-risk Lantana infestation will spread throughout. Thus, control of the dense infestations and then continued suppression of Lantana and retaining low levels of weeds is the goal for ROA 3. Additionally, general weed management of other WONS and SRRC declared invasive species will occur as needed throughout the course of the offset life in order to prevent impacts to regenerative plantings.

The Scenic Rim Regional Council Biosecurity Plan 2023-2028 (SRRC, 2024) sets out the aim to control declared pest plants within the region. This plan includes information and strategies for landholders to effectively manage pest species. *Lantana camara* is listed as a declared pest plant within the Scenic Rim region and restricted invasive species under the Queensland *Biosecurity Act 2014*. Under the Queensland *Biosecurity Act 2014* it requires everyone to take all reasonable and practical steps to minimise the risks associated with invasive plants and animals under their control (referred to as a GBO). The GBO states that reasonable and practical is

dependent on the current land use practices undertaken by the landholder. The GBO is a risk ratings-based approach, where risks are managed appropriately based on their threat to the land use practices.



Photo Plate 7: Examples of significant Lantana invasion within ROA 3 (*top*) and scattered throughout paddock space (*bottom*).

PROPOSED ACTION

- Implement the Rehabilitation Management Plan (Appendix E).
- In accordance with the RMP, manage weeds of national significance (WONS), SRRC declared weeds and other weeds such which may have an impact on habitat regeneration is to occur in the entire ROA 3, with a particular focus on suppression of the spread of *Lantana camara*.
- Prevent the further spread or establishing of new *Lantana camara* outbreaks within the ROA 3 by excluding cattle and controlling pest species from the offset management zone.

MANAGEMENT ACTION COMPLETION CRITERIA

Timing	Completion Criteria
Year 1	Implement the RMP and ensure WONS are treated within 12-months of the commencement of the offset
Year 2	Reduce WONS to <5% by the end of Year 2
Year 3 – 20	Maintain WONS cover at <5% for the life of the offset

MANAGEMENT ACTION RESPONSIBILITY

The Offset Provider will be responsible for establishing, resourcing and funding all weed management actions of the OMP and RMP including management and monitoring actions.

MANAGEMENT ACTION MONITORING

A number of monitoring actions relating to the presence of WONS and weeds generally are proposed as part of the implementation of the OMP and RMP.

Completion of baseline WONS surveys providing an actual mapped extent of infestations and occurrences in hectares to be used as the benchmark for measuring improvement.

A rehabilitation monitoring program including weed monitoring is detailed in the RMP which proposes a monitoring frequency of quarterly in Year 1 of the offset, bi-annually in Years 2-5 and annually for Years 6-10 until planted trees become semi-mature. An initial baseline setup is also proposed prior to the commencement of any weed treatment works occurring. Refer to Appendix F for further details regarding the weed monitoring methodology. This is proposed as additional to the MHQA surveys.

A suitably qualified person will complete monitoring for WONS before the end of Years 5, 10, 15 and 20 of the offset to track against the interim milestone and completion criteria in the environmental outcomes (see Appendix A).

MANAGEMENT ACTION REPORTING

- The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project Annual Compliance Report.
- Photo Monitoring Reports and Rehabilitation Monitoring Reports to be prepared at frequencies specified in the RMP by a suitably qualified person (Appendix F).

- Milestone weed monitoring survey results will be reported by the suitably qualified person in the 5, 10, 15 and 20 Year Milestone Report. This will provide detail on survey methodologies and detected WONS and other weed presence with reference to the baseline survey data.
- Implementation of the weed management actions within the RMP will be detailed annually by the Offset Provider in OAARs.
- Reporting, or a sample of, will be included in the relevant Annual Compliance Report.

MANAGEMENT ACTION RISKS AND ADAPTIVE MANAGEMENT

The dominant WONS species present within the offset area is Lantana with some occurrence Fireweed. A range of other exotic grass and herbaceous species are present, indicative of the high level of disturbance.

In the event weed management targets are not met within the prescribed timeframes of the OMP and the RMP, adaptive management will be triggered which includes:

- Adopting different management techniques
- Increasing the use of successful techniques
- Increasing the intensity/frequency of management program
- Changing the timing or locality of proposed target treatment locations or events

ACTION 3: STOCK MANAGEMENT AND CROPPING DISCONTINUATION

MANAGEMENT ACTION JUSTIFICATION

The Rosevale offset property has historically been utilised for agricultural uses, including, cattle grazing and pastural cropping. The property has retained extensive pasture paddocks consisting of native grasses and artificially improved introduced pastures. Cattle grazing is consistently observed on the Rosevale offset property, with the intensity of grazing directly related to the density of pasture available (i.e., correlated with rainfall) and the beef market prices. Given the climatic season within recent years providing higher rainfall for vigorous pasture growth and increased beef prices, the head of cattle on the Rosevale offset property have likely increased.

It is observed that there is some limited research that intensive cattle grazing can result in some positive biodiversity outcomes, such as to control invasive species. Additionally, for these conservation outcomes to be met it has been noted that a number of circumstances need to occur. For instance, stock must be controlled to graze areas needing treatment and excluded from sensitive wet areas where soil is most vulnerable to trampling. Stock must also be assured to be consuming the desired weed species and not native plant species intended for regeneration (Charles Sturt University, 2012). In general, clear treatment goals, control areas and monitoring programs need to be implemented for this system to work and the cost and benefits considered when compared to other weed treatments, such as slashing or burning. Overall, it is generally agreed that cattle farming has higher adverse effects to conservation rather than benefits due to re-engineering the landscape, removing potential for native species regrowth and ultimately supports predator species.

The risks of ongoing cattle grazing on the land could vary from low to medium to high subject to the future maintenance or expansion of the grazing use, which is driven by a number of economic factors, however primarily the rise and fall of the beef market. Regardless of the long term, the current highest and best use for the land is the continuation of cattle grazing. No reduction in risk or improvement in condition or value of the Koala and Grey-headed Flying-fox habitat will occur without direct intervention and a change in use (such as this offset outcome).

The risks of continued cropping are not significant outside of the area this activity is occurring. Impacts from this activity are generally straightforward where the land being utilized cannot support a woodland ecosystem. Tilling and ploughing of the land, if done correctly, often doesn't significantly impact soil health in the same way grazing does due to the intention to produce a healthy crop. Therefore in discontinuing cropping and preparing the area for revegetation this generally creates a direct benefit to conservation as long as management and monitoring are undertaken correctly and consistently, as per the guidance within this OMP.

PROPOSED ACTION

The removal of degrading activities being grazing from stock and cropping will be discontinued within ROA 3. The following actions will be completed:

- The perimeter of the offset property will be fenced with fauna friendly livestock exclusion fencing to exclude livestock from ROA 3. Where existing barbed wire fencing is retained, it will be retrofitted to replace the top strand with plain wire. Refer to **Plan 16** for the location of property-wide and offset area-specific stock exclusion fencing.
- Unnecessary barbed wire fencing with potential entanglement impact to fauna will be removed from within ROA 3.
- Cropping and ploughing activities will be discontinued within ROA 3 and the area remediated to reflect natural pre-agricultural conditions.

MANAGEMENT ACTION COMPLETION CRITERIA

Timing	Completion Criteria
Year 1	• Exclude stock from ROA 3 and discontinue cropping within the first year of the offset, prior with the intent to complete prior to the commencement of offset works. • Removed unnecessary barbed wire fencing from within the ROA 3 and retrofit any retained fencing, within the first year of the offset commencing.
Year 2 – 20	• Nil stock breaches into offset area (post completion of all fencing). • No reporting of stock impacts as justification for not achieving environmental outcomes and interim milestone targets.

MANAGEMENT ACTION RESPONSIBILITY

The Offset Provider will be responsible for establishing, resourcing and funding the construction, monitoring, maintenance and reporting of all fencing (using fencing contractors where deemed appropriate) used to exclude cattle from ROA 3.

The Offset Provider will discontinue cropping and resource/fund the remediation works on all previously cropped lands within ROA 3.

MANAGEMENT ACTION MONITORING

Monitoring of fence lines and livestock absence will be completed by the Offset Provider as part of routine monitoring to be completed quarterly for the first year and then annually from Years 2-20.

MANAGEMENT ACTION REPORTING

The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project Annual Compliance Report.

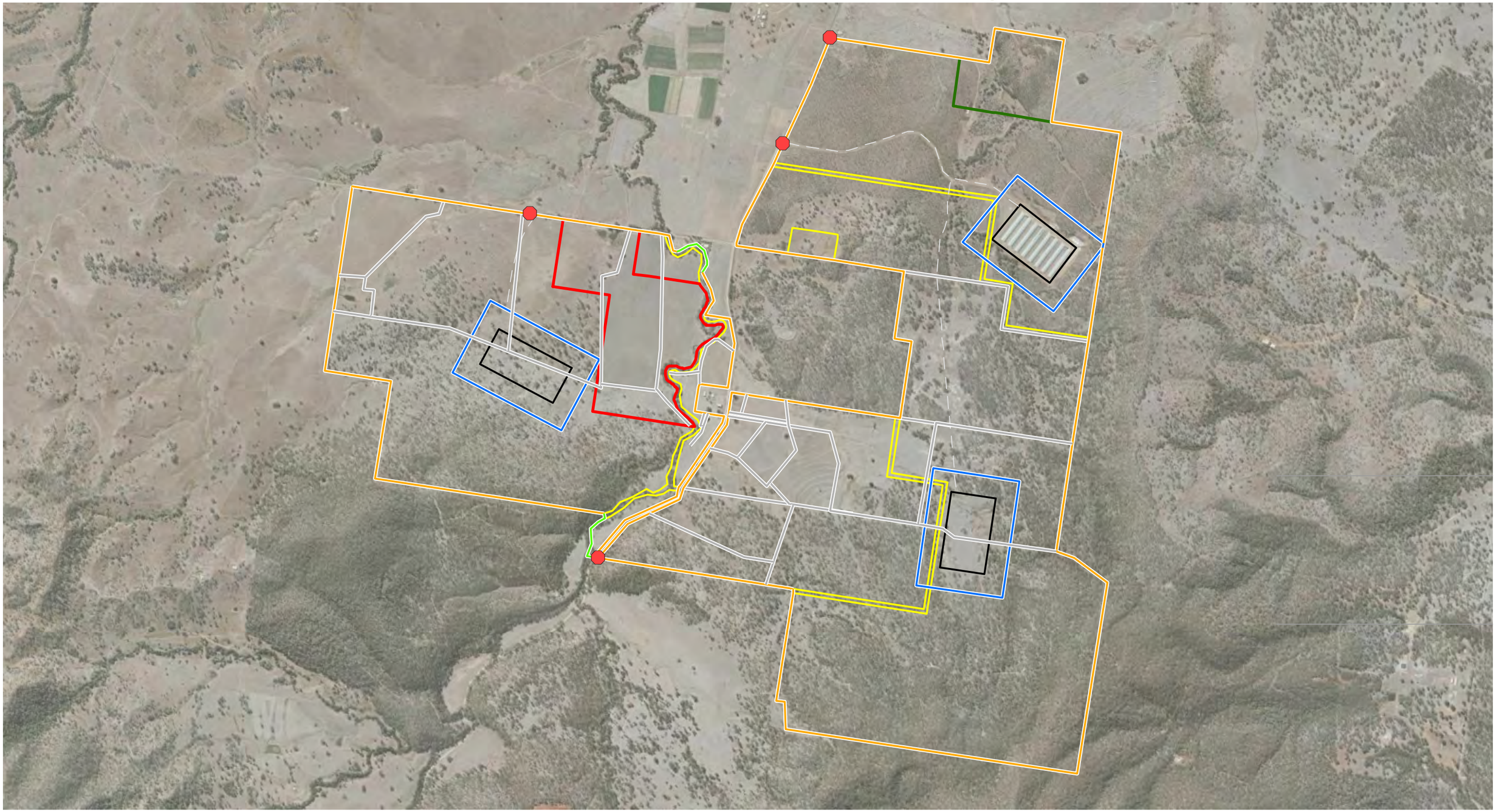
Documented evidence of fence monitoring and maintenance rectifications will be reported within OAARs.

MANAGEMENT ACTION RISKS AND ADAPTIVE MANAGEMENT

Providing the right type of fencing is installed in the correct location and monitored the risk of failure is extremely low.

While unlikely to occur with the proposed management framework, any breach of cattle accessing the ROA 3 would be identified through the general course of offset establishment or maintenance or as part of the cattle operator's routine stock checks. Damage as a result of a short-term breach is likely to be minimal and reversible through reinstatement works.

16. Offset Property and ROA 3 Stock Exclusion Fencing



Montauban Environmental Offsets

1:18,000

0 100 200 300 400 m

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

References:
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Project: Rosevale Offset Area 3

Date: 23/10/2025

10559 E 16 OMP_P ROA Stock Exclusion A

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Legend

- Approved Offset Boundary
- Future Offset Boundary
- Offset Area
- Proposed Chicken sheds
- Poultry shed access track

Stock Exclusion Fencing

- Existing farm fence to remove
- Existing boundary fence to be retrofitted as fauna friendly
- New fauna friendly boundary fence
- New fauna exclusion fencing
- Signage locations

ACTION 4: ACCESS AND TRESPASS MANAGEMENT

MANAGEMENT ACTION JUSTIFICATION

The Rosevale offset property is surrounded to the north, east and west by large cattle grazing operations. The impacts of unlawful access and trespassing mimic those listed in the 'Stock Management' management action section of this management plan (trampling, compacting, weed spread, fence destruction). Without a system for identifying and preventing or controlling access and trespassing the actions established for on-site stock management will be undermined.

PROPOSED ACTION

- The ROA 3 will be fenced using property-wide perimeter fencing and maintained for the life of the offset. Offset property perimeter fencing will separate land use activities from adjoining properties.
- Ensure no new access tracks throughout ROA 3 unless to support offset outcomes.
- Notify adjoining land owners of purpose and outcomes of ROA 3.

MANAGEMENT ACTION COMPLETION CRITERIA

Timing	Preliminary Completion Criteria
Year 1	Inspection and rectification of all external fence boundaries adjoining ROA 3
Year 1	Notification of ROA 3, purpose and outcomes to all adjoining land owners (where applicable)
Year 1 – 20	• Maintain ROA 3 / offset property boundary fencing to prevent unauthorised access to ROA 3 • No new access tracks through ROA 3 unless to support offset outcomes

MANAGEMENT ACTION RESPONSIBILITY

The Offset Provider is responsible for funding and undertaking all actions relating to access and trespass management.

MANAGEMENT ACTION MONITORING

- Evidence of erected fencing and notification to adjoining landowners (where applicable);
- Fence monitoring as per Management Action 3: Livestock Control and Cropping Discontinuation; and
- No evidence of stock or illegal access influence in outcomes scheduled for the ROA 3 habitat improvement.

MANAGEMENT ACTION REPORTING

The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project Annual Compliance Report.

MANAGEMENT ACTION RISKS AND ADAPTIVE MANAGEMENT

Factors to reduce the risk of impacts from unauthorised access on the Rosevale offset property include:

- Ownership of the land by the offset provider and therefore any residual grazing activities will be secondary land uses to the approved offset outcomes;
- Implementation of a legally binding mechanism (Voluntary Declaration under the *Vegetation Management Act 1999*) which provides protection of existing and created habitat values. The Voluntary Declaration applies the regulations of the *Vegetation Management Act 1999* to the land title which remains regardless of the transfer of ownership or sale of the land; and
- Fauna friendly livestock exclusion fencing around the perimeter of the ROA 3.

Given there is no legal requirement for access through the land holding (e.g. no formal access easement) if necessary, enforcement options are available, however, it is considered extremely unlikely this would be required provided alternative access points are established which do not conflict with the offset outcomes.

ACTION 5: REHABILITATION AND RESTORATION MANAGEMENT

MANAGEMENT ACTION JUSTIFICATION

MNES habitat restoration will occur throughout the entirety of ROA 3, transitioning 41.3 ha of grassed grazing into vegetated ecosystems supporting habitat for MNES. The MNES habitat restoration will:

- Be in accordance with the pre-clear regional ecosystem(s), being RE12.8.14 and composite RE 12.8.17/12.8.14;
- Expand the available MNES habitat through planting of broad hectare cleared land that adjoins mapped Koala Habitat Area with NJKHTs;
- Expand the available GHFF foraging habitat through planting of broad hectare cleared land with foraging species;
- Expand the available foraging habitat for the Regent Honeyeater and Swift Parrot by planting preferred foraging species;
- Support natural regeneration in regrowth vegetation through weed and pest management and;
- Provide new connectivity with surrounding habitat for the protected matters which adjoins the bioregional conservation corridor.

37.9 ha of AU 1 is proposed for MNES habitat reconstruction and 3.4 ha of AU 2 is proposed for reconstruction with assisted natural regeneration. This will increase foraging and dispersal habitat for Koala and Grey-headed Flying Fox within 20 years via planting non-juvenile Koala habitat trees and allowing regrowth to naturally regenerate via suppression and management of weeds. The rehabilitation program will be undertaken by suitably qualified personnel and will include measures to ensure the maintenance and survival of new breeding and foraging trees in the offset areas.

A range of recent studies demonstrate that rehabilitation of disturbed land can successfully provide functional habitat for koalas when rehabilitation is appropriately designed and implemented.

Cristescu et al. (2013) investigated koala use of post-mining rehabilitated areas on North Stradbroke Island and found that koalas actively re-occupied rehabilitated sites less than 15 years old. Individuals using rehabilitated areas accessed suitable food and roost trees, exhibited good body condition, and demonstrated high reproductive output, with no discernible difference in predation when compared to adjacent undisturbed habitats. The study concluded that rehabilitated sites were capable of providing habitat comparable to undisturbed environments.

Other studies support these findings. FitzGibbon et al. (2012) recorded koala recolonisation of rehabilitated mine landscapes in central Queensland, identifying availability of suitable food tree species and proximity to existing koala populations as key determinants of successful habitat use. Where these elements were present, rehabilitated areas were utilised by koalas.

Guidance for revegetating koala habitat developed by the Australian National University (Beale et al. 2022) carried out a review of peer-reviewed literature finding that rehabilitated habitats can contribute meaningfully to koala conservation where revegetation incorporates preferred food tree species, sufficient structural complexity, and landscape connectivity.

Overall, the available scientific evidence demonstrates that rehabilitation of disturbed areas can provide suitable koala habitat, provided that rehabilitation targets species composition, structure and connectivity consistent with koala ecology.

Restoration is a high cost and high labor-intensive task from preparation to commencement through to the first 5 years of establishment. Only planning and preparation works are proposed within Year 1 of the offset while beginning communication with a local nursery for stock will be conducted. However, all rehabilitation plantings are to be completed by the end of Year 2. This staged process of rehabilitation is recommended under the *SEQ Restoration Framework Manual* (Chenoweth EPLA, 2012) and SER Australasia *National Restoration Standards* (SERA, 2017). Under these guidelines it is suggested that larger sites be broken into a number of different management zones with progress occurring at different stages within each zone. Therefore, allowing for each zone to get the same amount of care and management practices. As these zones move to maintenance and the time required for each zone is reduced these can be consolidated.

Additionally, the Victorian Government Department of Sustainability and Environment *Native Vegetation Revegetation Planting Standards* (DSE, 2006) indicates that staged or successive plantings which result in more than one age class allows for better natural recruitment, higher vegetation complexity and easier adaptive management.

Benchmarks for rehabilitation efforts are derived from the definition of remnant vegetation under the *Vegetation Management Act 1999*. Vegetation can be mapped as remnant vegetation and associated essential habitat for Koalas if the canopy is 70% if the height, 50% of the cover and similar species composition of the appropriate pre-clearing RE (Queensland Government 2015). Therefore, the final benchmark at 20 years for rehabilitation is 70% of the reference benchmark cover (for canopy, shrub and ground-layer) and 50% of the reference benchmark height (for canopy and shrub layer) of the appropriate RE.

All revegetation and planting species are to be in accordance with the technical regional ecosystem for the dominant RE being RE12.3.3, RE12.8.17 with elements of RE 12.8.14. The Queensland Herbarium descriptions are provided below:

- RE 12.3.3 is described as: *Eucalyptus tereticornis* woodland. *Eucalyptus crebra* and *E. moluccana* are sometimes present and may be relatively abundant in places, especially on edges of plains and higher level alluvium. Other species that may be present as scattered individuals or clumps include *Angophora subvelutina* or *A. floribunda*, *Corymbia clarksoniana*, *C. intermedia*, *C. tessellaris*, *Lophostemon suaveolens* and *E. melanophloia*. Occurs on Quaternary alluvial plains, terraces and fans where rainfall is usually less than 1000mm/y. Not a Wetland. (BVG1M: 16c).
- RE 12.8.17 is described as: Mixed woodland with combinations of *Eucalyptus crebra, E. melanophloia, E. tereticornis, Corymbia tessellaris, C. intermedia*, and commonly containing *Angophora subvelutina* and *E. melliodora*, with a grassy ground layer. Usually occurs on mid and lower slopes of hills on Cainozoic igneous rocks, especially basalt. Not a Wetland. (BVG1M: 11a).
- RE 12.8.14 is described as: *Eucalyptus eugenioides, E. biturbinata, E. melliodora* +/- *E. tereticornis, Corymbia intermedia, E. crebra* open forest. *Allocasuarina torulosa* is a common understorey species. Localised occurrences of *Eucalyptus laevopinea, E. quadrangulata* and *E. banksii* may occur. Occurs on Cainozoic igneous rocks, especially basalt. Not a Wetland. (BVG1M: 11a).

The Queensland Herbarium BioCondition benchmarks (v3.6) for regional ecosystem RE12.3.3 indicate a benchmark for remnant canopy tree height as 25 m and 9 m for subcanopy, remnant tree canopy coverage as 40% and subcanopy coverage as 8%. RE 12.8.17 has a benchmark for remnant canopy tree height of 19 m and 10 m for subcanopy, and the remnant tree canopy coverage is 48% with sub-canopy coverage as 20% and shrub canopy coverage as 5%. Therefore, once the AU1 and AU2 reach 70% of these prescribed heights and 50% of these prescribed canopy coverages it can be considered remnant.

The rehabilitation planting will be completed to reflect the mapped dominant pre-clear regional ecosystem on-site RE12.3.3 and RE 12.8.17 with elements of RE 12.8.14 via incorporating the following eucalypt species into revegetation:

- *Eucalyptus melliodora* (Yellow Box)
- *Eucalyptus eugenioides* (Thin-leaved Stringybark)
- *Eucalyptus crebra* (Narrow-leaved Ironbark)
- *Eucalyptus melanophloia* (Silver-leaved Ironbark)
- *Eucalyptus tereticornis* (Forest Red Gum)
- *Corymbia tessellaris* (Moreton Bay Ash)
- *Corymbia intermedia* (Pink Bloodwood)
- *Angophora subvelutina* (Rough-barked Apple)

Of the above, *E. melliodora* and *E. eugenioides* are identified as foraging trees for the regent honeyeater and swift parrot with *E. tereticornis* as a foraging species for the swift parrot only.

Planting will occur in accordance with the prescribed methodology in the RMP with a higher number of trees to be planted within EMZ 1.

Within particularly disturbed areas of non-remnant vegetation, the objectives of this plan are long term and may take longer than 15 years after commencement of implementation, particularly as the Queensland Herbarium quotes that in general it takes 30 years for a disturbed site to regain remnant status. However, the goal of regeneration actions are often to re-establish an ecosystem to a point where it is self-sustaining and able resilient to disturbance (Chenoweth EPLA, 2012). The SEQERF indicates that in order to achieve the self-sustaining ecosystem at least 2-5 years of implementation and maintenance needs to occur. Thus, the offset project provides a sufficient maintenance and implementation period which sets the revegetation areas towards remnant status following the completion of maintenance. Interim benchmarks via MHQA transects are to be conducted at regular intervals which will inform the progress of the rehabilitation/revegetation efforts towards achieving this plan's outcomes. Given this, adaptive management approaches can also be employed to redirect restoration approaches, if interim benchmarks are not being met.

The aim to plant vegetation by the end of Year 2 is not anticipated to impact the conservation benefits or outcomes of the restoration efforts by Year 20. Several studies on the benefits of revegetation, including one from La Trobe University in association with the Victorian State Governments Department of Energy, Environment and Climate Action (DEECA), have indicated that the benefits of revegetation are realized within the first 15 years of planting, particularly for bird and nectar foraging species (DEECA, 2020). This study in particular accredits the success of revegetation to a well-thought-out monitoring program and species selection, which is intended for ROA 3.

MANAGEMENT ACTION LOCATION

- The ROA 3 contains 37.9 ha of non-remnant vegetation (AU1) which is to undergo habitat reconstruction and 3.4 ha of sparse regrowth vegetation (AU2) which will undergo reconstruction and assisted natural regeneration techniques in accordance with the RMP (**Appendix F**).
- Plantings will also occur in the adjoining offset area under EPBC 2020/8651 to deliver the combined offset for the Regent Honeyeater and Swift Parrot (refer **Plan 17**).

MANAGEMENT ACTION COMPLETION CRITERIA

Timing	Preliminary Completion Criteria
Year 1	Complete Site Preparation work in accordance with RMP including: • Tilling / cultivating grazed grass areas for treatment of pasture grass seedbank in preparation for planting • Undertake soil testing for both the modified planting soil and for the planting locations • Commence seed collection and propagation in coordination with an external nursery
Year 2	Complete all offset area planting in accordance with planting palettes and densities proposed in the RMP by the end of Year 2
Years 1 – 20	Implement the RMP to ensure performance indicators are achieved particularly the mortality rate of plants (focusing on trees) is <10%

MANAGEMENT ACTION RESPONSIBILITY

The Offset Provider is responsible for:

- Funding the appointment of trained and experienced Bushland Regenerators or Revegetation contractors for the completion of all rehabilitation activities in accordance with the RMP (site preparation, planting, establishment and maintenance)
- Commissioning and funding tertiary trained Ecologists and Landscape Consultants for the survey, monitoring and reporting of interim and milestone revegetation outcomes.

MANAGEMENT ACTION MONITORING

A range of monitoring techniques are proposed as part of the offset program to allow for an effective monitoring regime that will promote adaptive management and high achieving offset outcomes. This includes methods prescribed under the RMP and habitat quality monitoring methods under the OMP.

Rehabilitation Management Plan

Monitoring methods to track rehabilitation progress against the RMP will comprise a mix of informal and formal monitoring methods to track progress against the proposed environmental outcomes for each MNES and objectives of the RMP. A range of performance indicators have been nominated. All monitoring will be undertaken by a suitably qualified Rehabilitation Contractor/Landscape consultant and/or Ecologist.

The utilisation of performance indicators as part of monitoring program is proposed as a way of measuring rehabilitation success during the establishment and maintenance phases of the offset. A table of performance indicators is provided in Appendix 02 of the RMP and forms the basis of the monitoring framework. Performance indicators are metrics by which the rehabilitation success of the offset area will be assessed in a meaningful and regularised approach and will be primarily used to assist with on-ground activities such as planting success and the identification of degrading factors that may be negatively affecting the offset area.

Performance indicator targets represent aspirational targets developed based on the proposed planting palette and densities, BioCondition benchmarks (v3.6) for the relevant regional ecosystems and anticipated response of performance indicators to the proposed rehabilitation regime.

Informal or qualitative monitoring techniques will be employed as part of the offset monitoring. Informal monitoring methods are less time-consuming and technical and form an important tool for determining ecological restoration success. Informal monitoring will occur through site inspections at prescribed monitoring intervals and will include the following techniques:

1) Photo monitoring, and
2) Visual assessment.

Formal monitoring of rehabilitation works involves collecting quantitative data at prescribed monitoring intervals using a combination of monitoring methods and techniques. Formal monitoring provides data that cannot be measured by informal observations and can be easily compared against quantitative performance indicators. This will include:

- MHQA transects at 5-yearly intervals (5, 10, 15 and 20 years) following the commencement of the offset. Transects will be repeated at baseline locations before the end of the relevant monitoring interval (e.g. before the end of Year 5) and will be completed in accordance with the baseline survey methodologies described in the OMP. Further details are provided in the subsection below.
- 10 x 10 metre / 100 m^2 plots (quadrats) to be completed quarterly for the first year following the completion of planting, bi-annually until the end of Year 5 and annually until the end of Year 10. This monitoring method is considered additional to the MHQA monitoring.

Refer to **Appendix F** for further details regarding the proposed monitoring methodology within the RMP and performance indicators.

Habitat Quality Monitoring

Achievement of the Environmental Outcomes as outlined in **Section 3** and **Appendix A** will be demonstrated through the replicated surveys completed in accordance with the MHQA methodology (Koala), GHFF FHA Tool and Swift Parrot and Regent Honeyeater Foraging Habitat Assessment methodologies.

The suitably qualified person as appointed by the Offset Provider will complete MHQA surveys before the end of Years 5, 10, 15 and 20 of the offset to assess against the interim milestones and environmental outcomes (Section 3 and Appendix A).

This will include:

- MHQA transects including stem density counts to be completed at baseline sampling locations and methodology described in Section 5. For Regent Honeyeater and Swift Parrot, stem density data collected at 100 x 20 m plots will be extrapolated per the baseline survey methodology to confirm the approximate number of non-juvenile preferred foraging species established within the offset area.
- Establishment of additional stem density monitoring plots (100 x 20 m area) within the offset area if deemed necessary to increase the resolution of extrapolated data for the GHFF FHA and Swift Parrot and Regent Honeyeater Foraging Habitat Assessment.
- Direct and indirect surveys to target Koala presence, including Spot Assessment Technique surveys, motion triggered camera trapping and spotlighting.

MANAGEMENT ACTION REPORTING

The results of informal (photo monitoring and visual assessment) and formal monitoring (10 x 10 m quadrats) will be detailed in quarterly/bi-annual/annual monitoring reports. Following each photo monitoring event, a Photo Monitoring Report will be prepared which will include the following information:

- Photo set at each monitoring location.
- Commentary on mortality rate and presence of WONS/other weeds at a minimum with any additional relevant observations to inform adaptive management such as species-specific responses or herbivory.
- Adaptive management (if required).

The results of the quadrat surveys will be detailed in a Rehabilitation Monitoring Report for each monitoring event and will be prepared by a suitably qualified Ecologist.

These reports will include a summary of overall success rate (namely of tree species), any degrading factors at the site that may or are currently affecting survival success and any recommended adaptive management measures.

MANAGEMENT ACTION RISKS AND ADAPTIVE MANAGEMENT

The potential for large scale revegetation to fail can occur from controllable factors (poor soil preparation, planting stock or maintenance regime) or external events (extreme frost, pest invasion, drought, flood or major wind). Potential losses from these factors will be mitigated in several ways:

1) Contractual obligations of appointed bushland regenerators or revegetation contractors will ensure retention of funds and minimum success rates. The contractor will be responsible for replacement and re-establishing failed stock or areas.
2) Contractor and Offset Provider will investigate insurance for major external events.

3) Implementation of a detailed RMP which prescribes industry standard and widely used regeneration methods to promote successful rehabilitation outcomes.
4) Species to be planted are consistent with the pre-clear and ground-truthed regional ecosystem communities which considers underlying land form and soil specifications required for the species.
5) Intensive monitoring program using qualitative and quantitative monitoring methods prescribed under the RMP to allow for early identification of potential issues (e.g. higher than anticipated mortality rate) and enabling effective adaptive management.
6) Identification of corrective action triggers for adaptive management framework have been detailed (refer below and also Appendix F – RMP).

Adaptive Management Framework – Corrective action triggers

Multiple corrective action triggers for adaptive management are proposed under the performance indicators detailed in Appendix 02 the RMP. This includes:

- Native plant mortality >10%
- WONS cover >5%
- Number of non-juvenile stems of swift parrot foraging species (*E. melliodora, E. eugenioides* and *E. tereticornis*) not increasing as proposed
- Number of non-juvenile stems of regent honeyeater foraging species (*E. melliodora* and *E. eugenioides*) not increasing as proposed

A survival rate of 90% of tree species is proposed to be achieved for the offset area with a focus on species identified as preferred or supporting foraging species for the Critically Endangered Regent Honeyeater and Swift Parrot.

Where survival rates are observed to be less than 90% as per qualitative and quantitative monitoring methods, this may indicate the presence of a degrading factor not previously identified or considered at the site and may require adaptive management measures to be considered and implemented. Degrading factors are to be identified as part of regular monitoring and will form the basis for actioning adaptive management.

Adaptive management measures may include a combination of the following:

- Identify and address the degrading factor (e.g. soil issue, pests, species failure).
- Remedial plantings in areas of dieback to bolster survival rates to above 90%.
- Introduce a different species *i.e.,* if one plant species consistently dies on a site, consider using in its place a species that is performing well.
- Adjust planting methods such as using advanced tube stock or direct seeding, modifying site preparation techniques.
- Modify weed management techniques or frequency where WONS exceed 5%.

Example from another offset area

The Rosevale offset property contains one currently approved offset (ROA 1) associated with EPBC 2021/9005, located in the north-eastern part of the offset property. The ROA 1 offset is approximately 17 ha in size and contains a mix of planting and assisted natural regeneration rehabilitation areas.

Plantings within ROA 1 are currently 1-2 years old and demonstrating a varying levels of success confirmed through recent inspections and photo monitoring. Refer to Photo Plate 8. Some losses have been reported, attributed to ongoing wet weather and site inundation, however, are being rectified through remedial plantings.

Despite the presence of failed plantation within the offset property there is also evidence of successful plantation within the ROA 1 offset comprising *Eucalyptus saligna*, a species which is not endemic to the area, and is at least 10 years old (Photo Plate 9). While the success of *E. saligna* is surprising given its lack of endemicity, it is regarded as highly adaptable to conditions such as poor soils and unfavourable climate. It is likely the parts of the offset property containing failed plantation species comprised species incorrectly suited to the site or species with lower tolerance.

There is considered to be limited evidence in the contemporary history of the offset property to suggest the proposed planting dominated offset and proposed planting success rate would not succeed particularly with the implementation of the intensive management and monitoring regime proposed under the RMP and adaptive management framework.

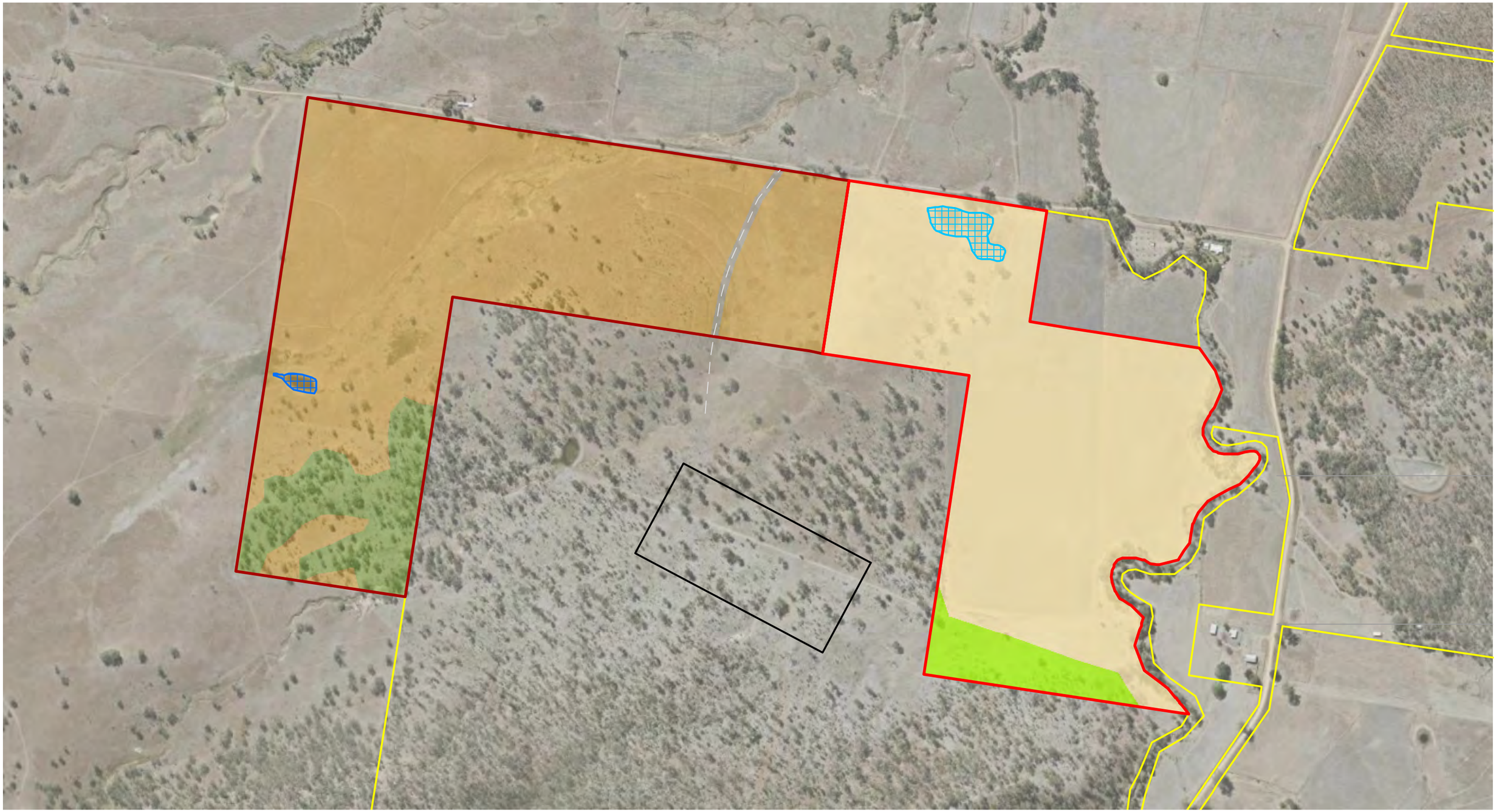


Photo Plate 8. Plantings within ROA 1



Photo Plate 9. Successful *Eucalyptus saligna* plantation within ROA 1.

17. ROA 3 and ROA 4 Planting Areas



Montauban Environmental Offsets

References:
© State of Queensland, 2022

Project: Rosevale Offset Area 3

Date: 28/10/2025

10559 E 17 OMP_P Planting Areas A

1:7,000

0 50 100 150 200 m

N W E S

Co-ordinate System: GDA2020 MGA Zone 56

DISCLAIMER:
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Legend

- Approved Offset Boundary
- Future Offset Boundary
- Proposed Chicken sheds
- Poultry shed access track
- ROA 3 Offset Area
- ROA 3 Waterbodies [0.8 ha] - No Planting
- ROA 4 Offset Area
- ROA 4 Waterbodies [0.2 ha] - No Planting

Offset Planting Area - ROA 3

- ROA 3 Assessment Unit 1: Non-remnant RE 12.3.3 [37.1 ha]
- ROA 3 Assessment Unit 2: Regrowth RE 12.8.17/12.8.14 [3.4 ha]

Offset Planting Area - ROA 4

- ROA 4 Assessment Unit 1: Non-remnant RE 12.8.17/12.8.14 [44.9 ha]
- ROA 4 Assessment Unit 2: Regrowth RE 12.8.17/12.8.14 [6.7 ha]

ACTION 6: BUSHFIRE MANAGEMENT

MANAGEMENT ACTION JUSTIFICATION

Uncontrolled wildfire is considered a key threat to Koala populations with impacts ranging from mortality and injury to loss or altered habitat resulting in a reduction in food source and in some cases increased exposure to predators. The purpose of management actions is centred on reducing the risk and severity of bushfires that may occur within the ROA 3 to prevent immediate impacts on Koala and MNES habitat and long-term through impacts to restoration activities.

Prescribed low-intensity burning as a bushfire management technique is widely employed and generally agreed upon as an effective means of reducing widespread and severe bushfire risk particularly when implemented in line with Indigenous cultural burning practices. The National Recovery Plan for Koala (DAWE, 2022) acknowledges the scope of impacts of prescribed burning on Koala population dynamics is not well understood. While the risk of bushfire can be reduced through prescribed burning regimes, it is acknowledged in the National Recovery Plan that the effectiveness of this is determined by the scale and severity of the bushfire, as exemplified in the 2019-2020 summer bushfires affecting areas that were considered low risk to bushfire.

The Rosevale offset property is mapped as containing high and very high-risk fuel loads for wildfire in both State Government and Scenic Rim Regional Council mapping attributed to its historical use as a native plantation site. The last recorded bushfire within the vicinity of the offset property occurred in January 2022. The bushfire was contained by Queensland Fire and Emergency Services (QFES) with no recorded damage to people or property. The ROA 3 was not impacted by this bushfire.

The Rosevale offset property retains limited vegetation interspersed with open pasture land and includes a system of boundary line firebreaks and access tracks for the protection of stock and farming infrastructure. This fire management system will be maintained as the offset property transitions from open pasture to MNES habitat restoration as specific offset activities are sequentially completed.

PROPOSED ACTION

- Bushfire Management Plan will be prepared and implemented to manage fuel loads.
- Management actions will occur across ROA 3 to monitor and manage fuel loads and along the boundaries of ROA 3 where firebreaks are required (Management Actions 3 and 5).

MANAGEMENT ACTION COMPLETION CRITERIA

Timing	Completion Criteria
Year 1	• Develop Bushfire Management Plan • Maintain existing firebreaks within / adjoining ROA 3
Year 1 – 20	• Monitor and maintain fuel loads within the ROA 3

Timing	Completion Criteria
	• Maintain firebreaks

MANAGEMENT ACTION RESPONSIBILITY

The Offset Provider is responsible for:

- Liaising and coordinating with Queensland rural fire service and SRRC to develop BMP and implement bushfire management measures; and
- Maintaining existing bushfire breaks; and
- Installing additional plantings required to account for losses as a result of uncontrolled bushfire.

MANAGEMENT ACTION MONITORING

- Fuel loads and bushfire breaks will be monitored annually by the Offset Provider as required depending on seasonal variation in fuel loads.
- Additionally, an annual assessment of seasonal bushfire risk will be completed to determine if adaptive management is required.
- Monitoring of this management action will be implemented from Year 1 onwards.

MANAGEMENT ACTION REPORTING

The Offset Provider is responsible for preparing and issuing Offset Area Annual Reports to the proponent within contracted timeframes for inclusion in the Approved Project Annual Compliance Report.

MANAGEMENT ACTION RISKS AND ADAPTIVE MANAGEMENT

Management actions to reduce the risk of bushfire impacts within ROA 3 include:

- Maintain existing bushfire breaks between adjacent landholders, in particular along the boundaries where the State Planning Policy bushfire hazard mapping indicates there is a 'high' or 'very high' risk of bushfire occurring;
- Cooperate with the local Queensland rural fire service, Scenic Rim Regional Council and adjoining land owners to minimise bushfire risk at a regional scale; and
- Undertake a feasibility assessment on insurance for plant stock replacement.

The overall assessment of bushfire risk is that their occurrence is unlikely within the life of the offset and consequences of such an event would be moderate. Without intervention and management, bushfire is evaluated as a low risk to this offset project. Refer to Section 9 for more details.

Notwithstanding the above, in the event a bushfire does occur within the ROA 3, adaptive management will involve:

- The provision of additional plantings where bushfire has occurred and damage or losses to plantings has resulted.
- Review of the adequacy of risk management measures to determine factors that may have resulted in the bushfire occurring and an assessment of any other management measures that could be implemented to reduce the risk further.

8. ADAPTIVE MANAGEMENT FRAMEWORK

This Offset Management Plan includes an adaptive management framework to be used as a governing principle and set of actions within specific management activities. Adaptive management is an iterative process designed to promote learning from the outcomes of management action implementation and using that knowledge gained from monitoring to identify issues and implement corrective actions. Continuously monitoring and adjusting strategies will allow the Offset Provider and engaged contractors and consultants to respond effectively to changing conditions and uncertainties to ensure the proposed Environmental Outcomes are achieved. The iterative nature of the adaptive management process is summarised in Figure 13.

A review of the OMP by a suitably qualified person is proposed to occur at Years 5, 10 and 15 to review the effectiveness of management actions and proposed corrective actions and identify if any amendments are required to ensure ongoing effectiveness.



Figure 13: Adaptive Management Process

CORRECTIVE ACTION TRIGGERS

As part of the adaptive management framework, corrective actions and triggers have been defined for management actions where appropriate to identify when management actions need to be adjusted as informed by monitoring.

The need for corrective actions will be identified through monitoring proposed under the OMP, RMP (Appendix F) and PMP. Table 50 provides a detailed summary of the corrective actions which will be implemented.

Table 50: Triggers and Corrective Actions (including timeframes)

Triggers	Monitoring method	Corrective Actions	Timeframes for Corrective Actions
Trees and plantings showing signs of ill health or decline	• Photo monitoring and visual assessment • Quadrat surveys	• Identify and address the degrading factor (e.g. soil issue, pests, species failure). • Remove ill or dead plantings, undertake any remediation works and re-establishment planting. • Remedial plantings in areas of dieback to bolster survival rates to above 90%. • Introduce a different species *i.e.,* if one plant species consistently dies on a site, consider using in its place a species that is performing well. • Adjust planting methods such as using advanced tube stock or direct seeding, modifying site preparation techniques.	• MEO to engage the suitably qualified professional within one month of detection to implement corrective actions. • Implement recommended mitigation measures within six months of detection. • Remove ill or dead plantings and undertake remediation works within six months of detection.
WONS not reduced to 5% cover by end of Year 2 and not maintained below 5% for life of offset	• Photo monitoring and visual assessment • Quadrat surveys • MHQA surveys	• Immediately treat all WONS, particularly Lantana camara, with delicate methods to avoid impacts to restoration works (mechanically or chemically dependent on circumstances). • Undertake an investigation of the potential source point of seeding. • Additional treatment and removal works are to be followed up during the next potential growth period to avoid any regeneration and potential seeding events. • Modify weed management techniques or frequency.	• Within three months of detection, noting that treatment during non-growth periods may be ineffective and are best targeted during growth periods for greater effectiveness. • Within three months of detection. • Within six months of initial detection.

Triggers	Monitoring method	Corrective Actions	Timeframes for Corrective Actions
Plant failure (>10% of stock) during the establishment period (2 – 5 years)	• Photo monitoring and visual assessment • Quadrat surveys	*Identification of issue* • Identify and address the degrading factor (e.g. soil issue, pests, species failure). *Follow-up procedure* • Remove ill or dead plantings, undertake any remediation works and re-establishment planting. • Remedial plantings in areas of dieback to bolster survival rates to above 90%. • Undertake soil testing to determine what rate of soil ameliorants or fertilizers may be required to improve the chemical balance of the soils for improved plant growth. • Introduce a different species *i.e.,* if one plant species consistently dies on a site, consider using in its place a species that is performing well. • Adjust planting methods such as using advanced tube stock or direct seeding, modifying site preparation techniques. • Should the planting fail again, the contractor is to engage a suitably qualified professional to identify the likely cause of plant failure.	*Identification of issue* • Rapid identification of issue within one month of detection. *Follow-up procedure* • Within three months or the next appropriate planting period (whichever comes first) of detection. • Apply in alignment with the recommendations made by the suitably qualified rehabilitation contractor and RMP.
Coarse woody debris is failing to become present naturally	• MHQA surveys	• The selective removal of limbs, shrubs, or trees (particularly from the shrub layer were forming dense thickets)	• At the 5, 10, 15 and 20 year MHQA monitoring events.

Triggers	Monitoring method	Corrective Actions	Timeframes for Corrective Actions
		• Importation of felled native timber from known impact areas where it would ordinarily be mulched and sent to land fill	
Growth rates not as expected	• Photo monitoring and visual assessment • Quadrat surveys • MHQA surveys	• Engage a suitably qualified professional to review the plantings and advise on reason for growth rate and methods to increase growth rates through other interventions. • Undertake soil testing to determine what rate of soil ameliorants or fertilizers may be required to improve the chemical balance of the soils for improved plant growth.	• Within three months of detection
Stochastic or nuisance events	• Regular site inspections by Offset Provider	• While such events (e.g. Fire, flood, drought, vandalism etc) are rare and can be managed by the contractor, where events take place, rectification works are required, to be guided by the relevant plan. • An event may be considered an incident where reporting to the DCCEEW is required.	• Rectification works are to be implemented within one month of the event. • Incidents to be reported to the DCCEEW according to timeframes specified within approval.
Ongoing presence of pest fauna (e.g. wild dogs) leading to destruction of regenerating habitat or MNES mortality attributed to feral animals	• Pest management • Photo monitoring and visual assessment • Quadrat surveys • MHQA surveys	• Where recurrent pest animal species are detected through prescribed camera monitoring events, engage pest management contractor to increase frequency and management techniques to target particular pest species. • If pest presence continues despite targeted management, review PMP to determine if management measures	• Within three months of continued presence identification.

Triggers	Monitoring method	Corrective Actions	Timeframes for Corrective Actions
		should be revised to include more site specific measures including targeted baiting and/or trapping.	
Monitoring and reporting illustrates that **Environmental Outcomes**, **Completion Criteria** and **Performance Indicators** under the RMP are not being achieved or are unlikely to be achieved by the end of the 20 year management timeframe and other corrective actions are not showing success	• Photo monitoring and visual assessment • Quadrat surveys • MHQA surveys	• Review corrective actions implemented to date and determine if these can be repeated or modified to achieve outcomes. • Consider extending offset timeframe to meet completion criteria. • Commence a review of the OMP and subsidiary plans where applicable (RMP, PMP, BMP). • Revise plans where appropriate and submit to the Minister for approval where required.	• Within six months of detection.

9. RISK MANAGEMENT

A limited number of risks associated with climate change, pest control, large scale rehabilitation and grazing land uses are evaluated for the Offset property. Risks are generally described and assessed against the likelihood and consequence model outlined in the Commonwealth Government's Department of Environment – *Environmental Management Plan Guidelines* (2014). The following risk factors are considered in more detail in this OMP:

- Risk 1: Wildfire;
- Risk 2: Drought;
- Risk 3: Shifting habitat range;
- Risk 4: Plant stock failure;
- Risk 5: Feral animal control;
- Risk 6: Weeds of National Environmental Significance increased infestations; and
- Risk 7: Livestock control and access and trespass management.

Table 51: Risk Rating Table (DAWE, 2022)

RISK MATRIX	
Likelihood (L): A qualitative measure of likelihood how likely is it that this event/circumstances will occur both before and after management activities are implemented	
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances
Consequence (C): Qualitative measure of what will be the consequence/result if the issue does occur	
Minor	Minor incident of environmental damage that can be reversed (*e.g. short-term delays to achieving strategy objectives, implementing low-cost, well-characterised corrective actions*)
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. short-term delays to achieving strategy objectives, implementing well-characterised, high cost/effort corrective actions*)
High	Substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. medium-long term delays to achieving objectives, implementing uncertain, high-cost/effort corrective actions*)
Major	Major loss of environmental amenity and real danger of continuing (*e.g. strategy objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies*)
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage (*e.g. strategy objectives are unable to be achieved, with no evidenced mitigation strategies*)
Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)	

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

RISK 1: WILDFIRE

The Rosevale offset property retains limited existing vegetation, however, given its historical use as a native plantation site, it is reflected as high and very high-risk fuel loads for wildfire in both State Government and Scenic Rim Regional Council mapping (**Figure 14**). The last recorded bushfire within the vicinity of the offset property occurred in September 2023 approximately 3.5 km north-west of ROA 3. The bushfire was contained by Queensland Fire and Emergency Services (QFES) with no recorded damage to people or property. The ROA 3 was not impacted by this bushfire.

The ROA 3 offset largely open pastureland interspersed with scattered trees and regrowth vegeation, and includes a system of boundary line firebreaks and access tracks for the protection of stock and farming infrastructure. This fire management system will be maintained as the offset property transitions from open pasture to MNES habitat restoration as specific offset activities are sequentially completed.

The overall assessment of bushfire risk is that their occurrence is **unlikely** within the life of the offset and consequences of such an event would be **moderate**. Without intervention and management, bushfire is evaluated as a **low risk** to this offset project. Refer to **Table 52** for the initial risk rating calculation.

Table 52: Bushfire Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Through the implementation of the management actions listed in **Section 7** and corrective actions listed in **Section 8**, the residual risk rating for this offset project is that it is **rare** that it would occur within the life of the offset and the consequences of such an event would be **moderate**. With intervention and management, the residual risk of a bushfire is evaluated as a **low risk** to this offset project. Refer to **Table 53** for the residual risk rating calculation.

Table 53: Bushfire Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

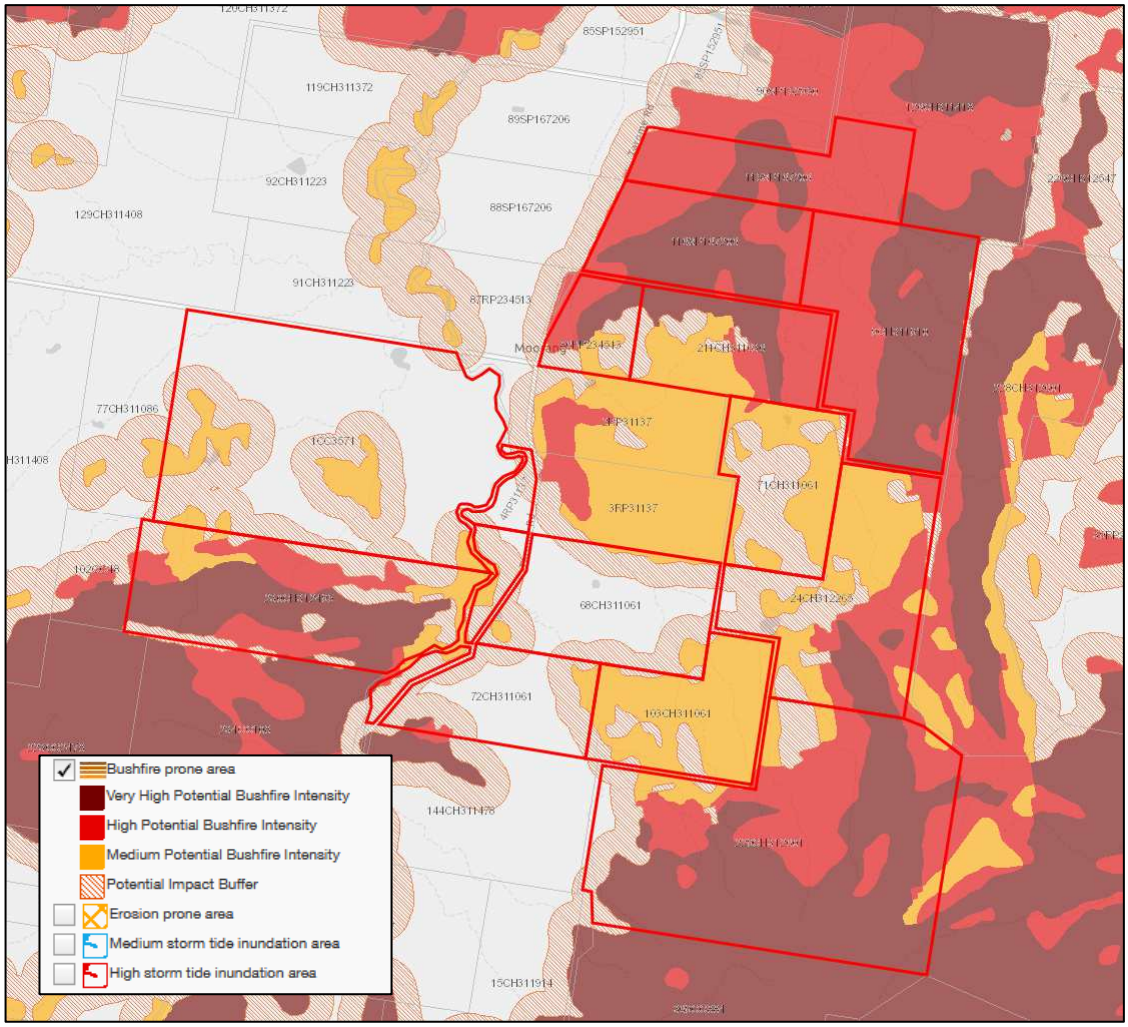


Figure 14: State Planning Policy bushfire hazard mapping (source: Queensland Government 2023)

RISK 2: DROUGHT

In May 2019 the Queensland Government declared the Scenic Rim Regional Council amongst a number of Local Government Areas as a drought area for the purposes of accessing funding and concessions for rural land holders. As of November 2023, this drought declaration has been removed as a result of the last few years of La Nina weather events, however, it remains that the Scenic Rim region has previously undergone significant drought.

On average yearly rainfall received in Boonah (nearest rain data collection centre) totals 741.0 mm. However as of November 2023 only 448.8 mm of rainfall has been recorded throughout the local area, well below the median yearly average. In contrast, the year of 2020 resulted in 786.4.00 mm of rain recorded, while 2021 resulted in 1,387.6 mm and 2022 resulted in 1556.2 mm.

The Climate Change Adaptation Strategies for the Koala prepared by Christine Adams-Hosking concluded that the highest probability of koala presence occurred at a mean annual rainfall of 700mm (Adams-Hosking et al. 2011). Therefore, despite potential drought conditions, the offset property rainfall is not significantly lower than the optimal range to support MNES presence.

The overall assessment of drought risk is that its occurrence is **likely** within the life of the offset and consequences of such an event would be **moderate**. Without intervention and management, drought is evaluated as a **medium risk** to this offset project. Refer to **Table 54** for the initial risk rating calculation.

Table 54: Drought Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Mitigation measures to reduce the risk of drought impacts on the Rosevale offset property include:

- Ensure offset design includes restoration and connection to higher moisture content soils associated with gully lines;
- Maintain site dams and waterbodies for use in offset MNES habitat restoration activities and as water sources for native animals; and
- Consider small 'turkey' dams as part of upper ridge rehabilitation for the purposes of water access for fauna and the creation of patches of high moisture soils and vegetation.

Through the implementation of the mitigation measures listed above, the residual risk rating for this offset project is that it is **likely** that it would occur within the life of the offset and the consequences of such an event

would be **moderate**. With intervention and management, the residual risk of a drought is evaluated as a **medium risk** to this offset project. Refer to **Table 55** for the residual risk rating calculation.

Table 55: Drought Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

RISK 3: SHIFTING HABITAT RANGE

A number of contemporary case studies and research papers have investigated the combined weather characteristics of climate change on the current and future distribution of suitable Koala habitat into the future. Koalas are considered to be at risk of these factors because of their low tolerance to adapt to environmental changes combined with the number of existing non-climatic related threats already well documented. More recently both species and their habitat have been affected nationally by the 2019-2020 bushfires. GHFF are also considered to be affected by climate change, however, most studies relate to the increased temperatures at the camp and roosting sites, with less material available on their foraging range. The proposed offset provides foraging habitat and thus not directly influence temperatures at the roosting locations, which periodically shift for a range of factors.

The Climate Change Adaptation Strategies for the Koala by Christine Adams-Hosking applied climate change distribution models for the koala and five of its essential eucalypt food trees to a conservation prioritisation framework ('Zonation'), to determine which Queensland local government areas (LGAs) were the highest priority for koala conservation and adaptation. The study included current (2011) and future predicted koala habitat distribution in 2070 showing a substantial migration eastward. The study further concludes that:

"*The highest probability of koala presence occurred at a mean maximum summer temperature of approximately 27oC and a mean annual rainfall of approximately 700 mm" (Adams-Hosking, C., Grantham, H. S., Rhodes, J.R., McAlpine, C. and Patrick T. Moss (2011). Modelling climate-change-induced shifts in the distribution of the koala. Wildlife Research, 38, 122–130)*.

As previously stated, the Rosevale offset property average rainfall in 2023 thus far is 448.8 mm, down on the annual rainfall average of 741 mm. However, these results have occurred during a time of El Niño weather event which brings expected lower than average rainfalls. Additionally, the mean recorded minimum and maximum annual temperatures for the region are 13.1°C to 27.1°C thus even with predicted temperature increases the Rosevale offset property would remain around the noted 27°C mean maximum parameter of the study. The land is also located within the current and 2070 Koala habitat distribution maps based on the A1F1 climate change scenario (Adams-Hosking, et al. 2011).

At the site scale the offset design is founded in the re-establishment of connected Koala habitat along gully lines and through higher moisture content soils. The design will connect existing low range and foothill habitat with gully lines and contiguous koala habitat within a known biodiversity corridor which contains all necessary habitat criteria.

The overall assessment of shifting habitat range risk is that its occurrence is **unlikely** within the life of the offset and consequences of such an event would be **high**. Without intervention and management, shifting habitat range is evaluated as a **low risk** to this offset project. Refer to **Table 56** for the initial risk rating calculation.

Table 56: Shifting Habitat Range Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Mitigation measures to minimise the risk of shifting habitat range on the Rosevale offset property include implementing the offset design described above.

Through the implementation of the measures listed above, the residual risk rating for this offset project is that it is **unlikely** that it would occur within the life of the offset and the consequences of such an event would be **high**. With intervention and management, the residual risk of a shifting habitat range is evaluated as a **low risk** to this offset project. Refer to **Table 57** for the residual risk rating calculation.

Table 57: Shifting Habitat Range Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

RISK 4: PLANT STOCK FAILURE

The entirety of the ROA 3 requires significant MNES habitat restoration activities. In projects that include wholesale restorations works, the risk exists for planting stock to fail in large volumes due to:

- Poor soil quality or incompatible match of soils to replanted vegetation types;
- Weather related impacts – frost / prolonged dry periods, excessive heat or cool periods;
- Poor quality planting stock or the sourcing of planting stock from a different geographic region; and
- Lack of appropriate planting area preparation – weed removal / pasture seed removal / cultivation, etc.

The majority of these challenges are expected to be managed through the use of experienced bushland regeneration experts and contractors with relevant insurance and payment retentions. Failure of planting stock is primarily an economic impact for this project as the ROA 3 will not achieve committed condition improvement and habitat expansion targets without rectification of planting works.

The overall assessment of plant stock failure risk is that its occurrence is **possible** within the life of the offset and consequences of such an event would be **major**. Without intervention and management, plant stock failure is evaluated as a **high risk** to this offset project. Refer to **Table 58** for the calculation of risk rating.

Table 58: Plant Stock Failure Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Through the implementation of the management actions detailed in **Section 7** and corrective actions listed in **Section 8** the residual risk rating for this offset project is that it is **unlikely** that it would occur within the life of the offset and the consequences of such an event would be **moderate**. With intervention and management, the residual risk of plant stock failure is evaluated as a **low risk** to this offset project. Refer to **Table 59** for the residual risk rating calculation.

Table 59: Plant Stock Failure Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

RISK 5: FERAL ANIMAL CONTROL

The Department of Primary Industries (DPI) lists feral dogs as abundant and widespread throughout the Scenic Rim region. Wild dogs (*Canis familiaris dingo, Canis familiaris dingo X Canis familiaris, Canis familiaris*) are listed as declared pest animals by Scenic Rim Regional Council, with the local council website documenting that the impact of wild dog activity has increased in the past 10 years due mainly to the increasing population in the region. Further, residents are increasingly engaged in raising livestock and poultry, resulting in a readily available food sources for wild dogs (SRRC 2021). The SRRC currently runs baiting, shooting and trapping programs throughout the region. Evidence of wild dog predation on livestock was recorded on the offset property. Research by Pest Animal Management QLD (2020) found that the Scenic Rim region contains an abundance of wild dogs, with evidence indicating that calf predation has increased significantly.

The overall assessment of feral animal control risk is that its occurrence is **possible** within the life of the offset and consequences of such an event would be **moderate**. Without intervention and management, feral animal control is evaluated as a **medium risk** to this offset project. Refer to **Table 60** for the calculation of risk rating.

Table 60: Feral Animal Control Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Through the implementation of the management actions listed in **Section 7** and corrective actions listed in **Section 8** the residual risk rating for this offset project is that it is **possible** that it would occur within the life of the offset and the consequences of such an event would be **minor**. With intervention and management, the

residual risk of feral animal control is evaluated as a **low risk** to this offset project. Refer to **Table 61** for the residual risk rating calculation.

Table 61: Feral Animal Control Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

RISK 6: WEEDS OF NATIONAL SIGNIFICANCE INCREASED INFESTATIONS

Preliminary and baseline surveys and observations over the Rosevale offset property recorded a number of weed species, with the most prevalent and inhibitive to Koala movement and other threatened species habitat restoration being WONS species *Lantana camara*. Lantana is listed as a WONS by the Commonwealth Government. The Scenic Rim Region Biosecurity Plan 2023-2028 identifies Lantana camara as a key invasive species and details information and strategies for landholders to effectively manage the species.

The overall assessment of WONS increased infestation risk is that its occurrence is **highly likely** within the life of the offset and consequences of such an event would be **high**. Without intervention and management, WONS increased infestations is evaluated as a **high risk** to this offset project. Refer to **Table 62** for the calculation of risk rating.

Table 62: Weeds of National Significance Increased Infestations Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Through the implementation of the management actions listed in **Section 7** and the corrective actions listed in **Section 8**, the residual risk rating for this offset project is that it is **unlikely** that it would occur within the life of the offset and the consequences of such an event would be **minor**. With intervention and management, the residual risk of increased infestations of WONS is evaluated as a **low risk** to this offset project. Refer to **Table 63** for the residual risk rating calculation.

Table 63: Weeds of National Significance Increased Infestations Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

RISK 7: LIVESTOCK CONTROL AND ACCESS AND TRESPASS MANAGEMENT

The Rosevale offset property has historically been utilised for agricultural uses, including cattle grazing. The property has retained extensive pasture paddocks consisting of native grasses and artificially improved introduced pastures. It is generally known that cattle farming can have adverse effects on conservation due to re-engineering the landscape, removing potential for native species regrowth and attraction of predator species.

Grazing cattle will be excluded from the ROA 3 through the installation of property-wide stock exclusion fencing which will also function to prevent unauthorised access and activities.

The overall assessment of livestock control and access and trespass management risk is that its occurrence is **possible** within the life of the offset and consequences of such an event would be **high**. Without intervention and management, livestock control and access and trespass management are evaluated as a **medium risk** to this offset project. Refer to **Table 64** for the calculation of risk rating.

Table 64: Livestock Control and Access and Trespass Management Risk Rating (Initial Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Through the implementation of the management actions listed in **Section 7** and corrective actions listed in **Section 8**, the residual risk rating for this offset project is that it is **unlikely** that it would occur within the life of the offset and the consequences of such an event would be **minor**. With intervention and management, the residual risk of unauthorised livestock control, access or trespass is evaluated as a **low risk** to this offset project. Refer to **Table 65** for the residual risk rating calculation.

Table 65: Livestock Control and Access and Trespass Management Risk Rating (Residual Risk Rating)

Final Risk Rating (R): A function of multiplying Likelihood (L) and Consequence (C)						
		Consequence				
Likelihood		Minor	Moderate	High	Major	Critical
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

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APPENDIX A: MNES HABITAT QUALITY GAIN TABLES

Table 1: AU1 Management Summary Koala – Non-remnant Paddock RE 12.3.3 (ROA 3)

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
Recruitment of woody perennial species	0	0	3	3	5	20 Years	Recruitment of a minimum of five tree species (>75% of the recruitment of woody perennial species in EDL benchmark) utilising the management actions 1, 3, 4, 5 and 6 outlined in **Table 4** and the management actions of the OMP.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Recruitment was established to currently be '0'. If improvement towards 75% has not been achieved at the 10-year mark (with 28.5% recruitment being aimed for by year 10), then then remedial actions to improve recruitment will be applied. These include refining weed and fire control methods and increasing remedial plantings.
Native plant species richness – Trees	2.5	2.5	5	5	5	10 years	All the expected tree species to be present as a result of specific management actions, utilising the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Tree species richness is currently at 25% of the benchmark. Recruitment of tree species is to be greater than 28.5% at 10 years as specified above. Improvement to a score of 2.5 has also been set at Year 5 to check the progress of canopy species richness. If the sub-canopy layer species richness has not improved to greater than 95% at 10 years (four tree species), then remedial actions to improve the

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
									prospect of achieving 100% in 20 years will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Native plant species richness – Shrubs	0	2.5	5	5	5	10 years	All the expected shrub species to be present as a result of specific management actions, utilising the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Shrub species richness is currently at 5% of the benchmark. Improvement to 40% of the benchmark by Year 5 has been set to check the progress of species richness. If the shrub species richness has not improved to 40% by year 5 and then greater than 95% at 10 years than remedial actions to improve the prospect of achieving 100% in 20 years will be applied. These include remedial plantings.
Native plant species richness – Grass	2.5	2.5	2.5	5	5	15 Years	All the expected grass species to be present as a result of specific management actions, utilising the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Grass species richness is currently at 33% of the benchmark. has not improved to greater than 95% ay 15 years than remedial actions to improve the prospect of achieving 100% in 20 years

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
									will be applied. These include remedial plantings.
Native plant species richness – Forbs	0	2.5	2.5	5	5	15 Years	All the expected forb species to be present as a result of specific management actions, utilising the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Forb species richness is currently at 5% of the benchmark. If the forb species richness has not improved to greater than 95% at 15 years, then remedial actions to improve the prospect of achieving 100% in 20 years will be applied. These include remedial plantings.
Tree Canopy Height	3	3	3	3	5	20 Years	A median tree height greater than 70% of the benchmark will be achieved as a result of the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Tree canopy height is currently at 30% (EDL) and 30.56% (sub-canopy) of the benchmark. If the tree height has not transitioned towards 70% at year 15 than the prospect of extending the management period may be investigated. By Year 20 species plantings to be a minimum of 18.9 m height (70% of the tree canopy height benchmark).
Tree Canopy Coverage	3.5	3	3	5	5	15 Years	Canopy coverage to be greater than 50% of the benchmark will be achieved as a result of the management actions 1, 3,	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10.	Tree canopy cover is currently at 23.75% (EDL) and 80% (sub-canopy) of the benchmark. Recruitment of tree species

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
							4, 5 and 6 outlined in **Table 4.**	Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	is to be greater than 20% at 15 years. If canopy cover has not reached 30% at 15 years, then remedial actions to improve the prospect of achieving 50% in 20 years will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Shrub Canopy Coverage	5	5	5	5	5	Immediate	Shrub canopy coverage to be maintained at greater than 50% of the benchmark will be achieved as a result of the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Shrub canopy cover is currently at 51.88% of the benchmark. Recruitment of tree species is to be maintained at greater than 50% at 10 years. If it is not maintained at 50% at 10 years, then remedial actions to improve the prospect of maintaining 50% in 15 years will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Native Perennial Grass Cover	1	3	3	3	5	20 years	Native grass cover to achieve 100% of the benchmark by	Baseline Site Condition attributes are established. Photo monitoring and quadrat	It is anticipated that native perennial grass cover will achieve 100% of the

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
							management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	benchmark by Year 10, currently reflecting 31.25% of the benchmark. If monitoring indicates native grass is not heading in an upward direction to 100% by Year 5 then remedial actions will be applied. These include refining weed and fire control methods to ensure native grass cover is maintained.
Organic Litter	0	3	3	3	5	20 Years	Organic litter to be between 50 and 200% of the benchmark achieved as a result of the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Organic litter is currently at 0% of the benchmark. If organic litter has not improved to greater than 25% at 15 years, then remedial actions to improve the prospect of achieving 50% in 20 years will be applied. These include refining weed and fire control methods to ensure organic litter is maintained.
Large Trees	5	5	5	5	5	Immediate	Between 0 and 50% of the benchmark for large trees will maintained as a result of management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified	As a result of large-scale historical clearing and on-going cropping and land grazing activities 0 large trees are present within the AU1 area. The large trees benchmark for the pre-

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
								professionals at 5, 10, 15 and 20 years.	clear regional ecosystem is 540 mm. It is estimated this would take longer than 20 years for the planted Eucalypts to reach the large tree threshold, particularly given that vegetation within lower rainfall regions tend to grow more slowly. However, the management actions applied on-site will establish a remnant ecosystem and protect an area in perpetuity where there is a high likelihood that large trees will establish. All site condition remedial actions also apply to achieving the large tree benchmark in the future.
Coarse Woody Debris	0	2	2	5	5	15 Years	Course woody debris greater than 50% and less than 200% of the benchmark will be achieved as a result of management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Coarse woody debris is currently 0% of the benchmark due to current pastoral practices. If monitoring indicates that coarse woody debris is not transitioning to between 50 and 200% by year 10 then remedial actions will be applied. These include a

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
									review of actions that impact on coarse woody debris such as fire regimes and importing native tree debris if necessary.
Weed Cover	0	5	10	10	10	10 Years	Weed coverage will reduce to less than 5% over the course of 10 years by the specific management actions, 3, 4, 5 and 6, outlined in **Table 4** and following sections of this OMP.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Weed coverage is currently 70%. If improvement to 5% has not been achieved at the 10-year mark, then remedial actions to reduce weed cover will be applied. This would include refining weed control methods.
Quality and Availability of food and foraging habitat	1	5	5	5	10	20 Years	Quality and Availability of food and foraging habitat will be achieved as a result of management actions 1, 2, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality and availability of food and foraging habitat is currently poor. All site condition remedial actions also apply to this criterium achieving a high rating.
Quality and Availability of Shelter	1	5	5	5	1	20 Years	Quality and Availability of shelter will be achieved as a result of management actions 1, 2, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality and availability of shelter is currently poor. All site condition remedial actions also apply to this criterium achieving a high rating.

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
Site Condition Score	24.5	41.5	64.5	74	90				
Overall Site Condition Score out of 3	0.74	1.25	1.94	2.22	2.70				
Size of Patch	10	10	10	10	10	NA	NA	NA	NA
Connectedness	2	2	2	2	2	NA	NA	NA	NA
Context	4	4	4	4	4	NA	NA	NA	NA
Ecological Corridors	6	6	6	6	6	NA	NA	NA	NA
Role of site location to species overall population in the state	5	5	5	5	5	Immediate	The role of the site location to species overall population is not anticipated to change.	NA	The role of the location to the species overall population in the state is not anticipated to change.
Threats to the species	7	7	7	7	7	Immediate	Threats to species will be reduced to less than 5% of the Year 1 baseline survey by specific management actions 2 & 6 outlined in **Table 4**.	Baseline attributes are established. This criterium is reliant upon the suppression and control of identified pest species on-site, in particular wild dogs and European fox. Pest monitoring will be evaluated as per the pest management program.	The control of pest species will suppress threats for the life of the offset, however, is not anticipated to provide a measurable uplift for the species.
Species Mobility Capacity	1	1	4	7	10	20 Years	Species mobility capacity will improve to limited restriction by specific management actions 1	Baseline attributes are established. Establish strategic photo monitoring points at commencement of offset. Habitat quality transects and	Species mobility is currently restricted by the absence of habitat and presence of invasive flora and fauna. All site condition remedial

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
							through 6 outlined in **Table 4**.	photo monitoring to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	actions, as well as threat reductions also apply to this criterium achieving a high rating.
Site Context Score	**35**	35	38	41	**44**				
Overall Site Context Score out of 3	**1.88**	1.88	2.04	2.20	**2.36**				
Presence	10	10	10	10	10	Immediate	It is anticipated that under the management actions specified in management actions 1 to 6 outlined in **Table 4.** Koala activity will continue to be recorded on-site.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Evidence of Koala in the form of scats was detected in AU2. It is anticipated once reconstruction plantings have reached sufficient heights and canopy connectivity is overall improved presence should significantly improve. All site condition remedial actions, as well as threat reductions also apply to this criterium achieving a high rating.
Usage	0	0	0	15	15	15 Years	It is anticipated that under the management actions specified in management actions 1 to 6 outlined in **Table 4.** Koala activity will be recorded providing evidence of breeding as per the conservation advice.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	SAT surveys currently indicate no usage of the assessment unit by Koala. If usage levels are not transitioning toward low level at the 10-year mark, then broader Koala population surveys will be

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
									undertaken to ascertain potential external causes and the management actions re-visited accordingly. If Koala activity has not improved to low level at 10 years, then the management period may be extended, and further remedial actions applied in consideration of other scoring improvements relative to potential external factors impacting on Koala activity.
Approximate Density	0	0	0	10	10	15 Years	It is anticipated that under the management actions specified in management actions 1 to 6 outlined in **Table 4.** Koala activity will be recorded providing an approximate density level increase to low.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	SAT surveys currently indicate no usage of the assessment unit by Koala. If usage levels are not transitioning toward low level at the 10-year mark, then broader Koala population surveys will be undertaken to ascertain potential external causes and the management actions re-visited accordingly. If Koala activity has not improved to low level by 20 years, then the management period may be extended, and further remedial actions applied in

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
									consideration of other scoring improvements relative to potential external factors impacting on Koala activity.
Role of the Population	5	5	5	5	5	Immediate	N/A not anticipated to change	N/A not anticipated to change	N/A not anticipated to change
SSR Score out of 70	**15**	15	15	40	**40**				
SSR Score out of 4	**0.86**	0.86	0.86	2.29	**2.29**				
Total Habitat Quality Scores	**3.47**	3.98	4.83	6.70	**7.34**				

Table 2: AU2 Management Summary Koala – Sparse Regrowth RE 12.8.17/12.8.14 (ROA 3)

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
Recruitment of woody perennial species	5	5	5	5	5	Immediate	Continued recruitment of a minimum of five tree species (>75% of the recruitment of woody perennial species in EDL benchmark) utilising the management actions 1, 3, 4, 5 and 6 outlined in **Table 4** and the management actions of the OMP.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Recruitment is currently at 100% of the benchmark. If this is not maintained, then then remedial actions to improve recruitment will be applied. These include refining weed and fire control methods and remedial plantings.
Native plant species richness – Trees	2.5	2.5	5	5	5	10 years	All the expected tree species to be present as a result of specific management actions, utilising the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Tree species richness is currently at 57.14% of the benchmark. Recruitment of tree species is to be greater than 90% at 10 years as specified above. If improvement to greater than 90% at 10 years (7 tree species), then remedial actions to improve the prospect of achieving 100% in 20 years will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Native plant species richness – Shrubs	2.5	2.5	5	5	5	10 years	All the expected shrub species to be present as a result of specific	Baseline Site Condition attributes are established. Photo monitoring and quadrat	Shrub species richness is currently at 70% of the benchmark. If the shrub

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
							management actions, utilising the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	species richness has not improved to 90% by year 10 then remedial actions to improve the prospect of achieving 100% in 20 years will be applied. These include remedial plantings.
Native plant species richness – Grass	2.5	2.5	2.5	5	5	15 Years	All the expected grass species to be present as a result of specific management actions, utilising the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Grass species richness is currently at 33.33% of the benchmark. has not improved to greater than 90% at 15 years than remedial actions to improve the prospect of achieving 100% in 20 years will be applied. These include remedial plantings.
Native plant species richness – Forbs	0	2.5	2.5	5	5	15 Years	All the expected forb species to be present as a result of specific management actions, utilising the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Forb species richness is currently at 16.67% of the benchmark. If the forb species richness has not improved to greater than 25% at 5 years or 90% at 15 years, then remedial actions to improve the prospect of achieving 100% in 20 years will be applied. These include remedial plantings.
Tree Canopy Height	4	4	5	5	5	10 Years	A median tree height greater than 70% of the benchmark will be achieved	Baseline Site Condition attributes are established. Photo monitoring and quadrat	Tree canopy height is currently at 50% (EDL) and 85% (sub-canopy) of the

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
							as a result of the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	benchmark. If the tree height has not transitioned towards 70% at year 15 than the prospect of extending the management period may be investigated. By Year 20 species plantings to be a minimum of 13.3 m height (70% of the tree canopy height benchmark).
Tree Canopy Coverage	2.5	2.5	3.5	3.5	5	20 Years	Canopy coverage to be greater than 50% of the benchmark will be achieved as a result of the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Tree canopy cover is currently at 8.85% (EDL) and 154% (sub-canopy) of the benchmark. Recruitment of tree species is to be greater than 20% at 15 years. If canopy cover has not reached 30% at 15 years, then remedial actions to improve the prospect of achieving 50% in 20 years will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Shrub Canopy Coverage	3	3	5	5	5	5 Years	Shrub canopy coverage to be maintained at greater than 50% of the benchmark will be achieved as a result of the management actions	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10.	Shrub canopy cover is currently at 35% of the benchmark. Recruitment of tree species is to be maintained at greater than

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
							1, 3, 4, 5 and 6 outlined in **Table 4.**	Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	50% at 10 years. If it is not improved to 50% at 10 years, then remedial actions to improve the prospect of maintaining 50% in 15 years will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Native Perennial Grass Cover	5	5	5	5	5	Immediate	Native grass cover to maintain 100% of the benchmark by management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	It is anticipated that native perennial grass cover will maintain 100% of the benchmark for the life of the offset, currently reflecting 139.06% of the benchmark. If monitoring indicates native grass is not maintained, then remedial actions will be applied. These include refining weed and fire control methods to ensure native grass cover is increased.
Organic Litter	3	3	5	5	5	10 Years	Organic litter to be between 50 and 200% of the benchmark achieved as a result of the management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be	Organic litter is currently at 50% of the benchmark. If organic litter has not improved to greater than 50% at 10 years, then remedial actions to

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
								completed by suitably qualified professionals at 5, 10, 15 and 20 years.	improve the prospect of achieving 50% in 15 years will be applied. These include refining weed and fire control methods to ensure organic litter is maintained.
Large Trees	5	5	5	5	5	Immediate	Between 0 and 50% of the benchmark for large trees will maintained as a result of management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	As a result of large-scale historical clearing and on-going cropping and land grazing activities large trees are at 8% of the benchmark. The large trees benchmark for the pre-clear regional ecosystem is 380 mm. It is estimated this would take longer than 20 years for the planted eucalypts to reach the large tree threshold, particularly given that vegetation within lower rainfall regions tend to grow more slowly. However, the management actions applied on-site will establish a remnant ecosystem and protect an area in perpetuity where there is a high likelihood that large trees will establish.

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
Coarse Woody Debris	5	5	5	5	5	Immediate	Course woody debris greater than 50% and less than 200% of the benchmark will be achieved as a result of management actions 1, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Coarse woody debris is currently 73.5% of the benchmark. If monitoring indicates that coarse woody debris is not maintained between 50 and 200% then remedial actions will be applied. These include a review of actions that impact on coarse woody debris such as fire regimes and importing native tree debris if necessary.
Weed Cover	0	5	10	10	10	10 Years	Weed coverage will reduce to less than 5% over the course of 10 years by the specific management actions, 3, 4, 5 and 6, outlined in **Table 4** and following sections of this OMP.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Weed coverage is currently 85%. If improvement to 5% has not been achieved at the 10-year mark, then remedial actions to reduce weed cover will be applied. This would include refining weed control methods.
Quality and Availability of food and foraging habitat	5	5	5	5	10	20 Years	Quality and Availability of food and foraging habitat will be achieved as a result of management actions 1, 2, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality and availability of food and foraging habitat is currently poor. All site condition remedial actions also apply to this criterium achieving a high rating.

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
Quality and Availability of Shelter	5	5	5	5	1	20 Years	Quality and Availability of shelter will be achieved as a result of management actions 1, 2, 3, 4, 5 and 6 outlined in **Table 4.**	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality and availability of shelter is currently poor. All site condition remedial actions also apply to this criterium achieving a high rating.
Site Condition Score	48	57.5	73.5	78.5	90				
Overall Site Condition Score out of 3	1.44	1.73	2.21	2.36	2.70				
Size of Patch	10	10	10	10	10	NA	NA	NA	NA
Connectedness	2	2	2	2	2	NA	NA	NA	NA
Context	4	4	4	4	4	NA	NA	NA	NA
Ecological Corridors	6	6	6	6	6	NA	NA	NA	NA
Role of site location to species overall population in the state	5	5	5	5	5	Immediate	The role of the site location to species overall population is not anticipated to change.	NA	The role of the location to the species overall population in the state is not anticipated to change.
Threats to the species	7	7	7	7	7	5 Years	Threats to species will be reduced to less than 5% of the Year 1 baseline survey by specific management	Baseline attributes are established. This criterium is reliant upon the suppression and control of identified pest species on-site, in particular	The control of pest species will suppress threats for the life of the offset, however, is not anticipated to

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
							actions 2 & 6 outlined in **Table 4**.	wild dogs and European fox. Pest monitoring will be evaluated as per the pest management program.	provide a measurable uplift for the species.
Species Mobility Capacity	4	4	7	7	10	20 Years	Species mobility capacity will improve to limited restriction by specific management actions 1 through 6 outlined in **Table 4**.	Baseline attributes are established. Establish strategic photo monitoring points at commencement of offset. Habitat quality transects and photo monitoring to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Species mobility is currently restricted by the absence of habitat and presence of invasive flora and fauna. All site condition remedial actions, as well as threat reductions also apply to this criterium achieving a high rating.
Site Context Score	**38**	38	41	41	**44**				
Overall Site Context Score out of 3	**2.04**	2.04	2.20	2.20	**2.36**				
Presence	10	10	10	10	10	Immediate	It is anticipated that under the management actions specified in management actions 1 to 6 outlined in **Table 4.** Koala activity will continue to be recorded on-site.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Evidence of Koala in the form of scats was detected in AU2. It is anticipated once reconstruction plantings have reached sufficient heights and canopy connectivity is overall improved presence should significantly improve. All site condition remedial actions, as well as threat reductions also apply

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
									to this criterium achieving a high rating.
Usage	15	15	15	15	15	Immediate	It is anticipated that under the management actions specified in management actions 1 to 6 outlined in **Table 4.** Koala activity will be recorded providing evidence of breeding as per the conservation advice.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	SAT surveys currently indicate usage by Koala. If usage levels are maintained as low level at the 10-year mark, then broader Koala population surveys will be undertaken to ascertain potential external causes and the management actions re-visited accordingly.
Approximate Density	10	10	10	10	10	Immediate	It is anticipated that under the management actions specified in management actions 1 to 6 outlined in **Table 4.** Koala activity will be recorded providing an approximate density level increase to low.	Baseline SAT attributes are established. Koala SAT surveys will be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	SAT surveys currently indicate usage by Koala. If usage levels are maintained as low level at the 10-year mark, then broader Koala population surveys will be undertaken to ascertain potential external causes and the management actions re-visited accordingly.
Role of the Population	5	5	5	5	5	Immediate	N/A not anticipated to change	N/A not anticipated to change	N/A not anticipated to change
SSR Score out of 70	**40**	40	40	40	**40**				
SSR Score out of 4	**2.29**	2.29	2.29	2.29	**2.29**				

Attribute	Current Score	Year 5	Year 10	Year 15	Year 20	Time until estimated benefit	Justifications / Management Actions	Monitoring	Adaptive Management
Total Habitat Quality Scores	5.76	6.05	6.69	6.84	7.34				

Table 3: AU1 Management Summary GHFF – Non-remnant Paddock RE 12.3.3 (ROA 3)

	T1	T2	T3	T4	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data	Raw Data	Raw Data									
Vegetation Condition	Cat X	Cat X	Cat X	Cat X	**5**	**5**	**5**	**5**	**10**	**10**	It is expected that with management actions 1, 3, 4, 5 and 6, outlined in **Table 4** the assessment unit 'Vegetation Condition' will readily attain regrowth status within 15 years and on the way to remnant status by Year 20.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	The assessment unit is to reach regrowth status in 15 years and be progressing towards remnant status by 20 years as per VMA definitions, which require 70% of height and 50% of expected cover to be reached. If the vegetation is not progressing toward regrowth status at 10 years, then remedial actions will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Species Richness	0	2	0	3	**1.25**	**5**	**10**	**10**	**20**	**20**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 4** the assessment unit 'Species Richness' will improve to at least two foraging species by year 5 and seven by year 15 which will then	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified	Species richness within the assessment unit is to achieve at least three foraging species by year 5 and seven by year 15. If the species diversity does not reflect this requirement at year 10, then remedial actions will be applied.

	T1	T2	T3	T4	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data	Raw Data	Raw Data									
											be maintained through to year 20.	professionals at 5, 10, 15 and 20 years.	This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Flower Score	0	0.565	0	0.383	**0.24**	**2**	**8**	**8**	**8**	**8**	It is expected that with management actions, 1, 3, 4, 5 & 6, outlined in **Table 4** the assessment unit 'Flower Score' will increase by Year 5 with the establishment of plantings.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Increase of flower scores by year 5 will be achieved by increasing winter flowering and foraging species on-site by two. If an increase in winter flowering species does not reflect this requirement at year 5, then remedial actions will be applied. These include remedial plantings of advanced stock.
Timing of Biological Shortages	0	8	0	10	**4.625**	**4.625**	**4.625**	**10**	**10**	**10**	It is expected that with management actions 1, 3, 4, 5 & 6 outlined in **Table 4** the assessment unit 'Timing of Biological shortages' will improve to cover all shortages based on flora species presence by year 5.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5,	No biological shortages to be present after trees meet semi-mature state (10 years). If the species present do not reflect this requirement at year 10, then remedial actions will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.

	T1	T2	T3	T4	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data	Raw Data	Raw Data									
												10, 15 and 20 years.	
Quality of Foraging Habitat	0	1	0	1	**0.5**	**5**	**10**	**10**	**20**	**20**	It is expected that with management actions 1, 3, 4, 5 & 6 outlined in **Table 4** will result in the increase of two foraging habitat tree species by year 5 and seven by year 15 which will then be maintained through to year 20.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality of foraging habitat within the assessment unit is to achieve at least two species by year 5 and five by year 15. If the species present do not reflect this requirement at year 10, then remedial actions will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Non-native Plant Cover	95%	75%	85%	25%	**70.00%**	**1**	**10**	**20**	**20**	**20**	Non-native plant cover within AU1 is high. It is anticipated that the weed management actions of 3, 4, 5 and 6 outlined in **Table 4** and following sections of this OMP will improve non-native plant cover to below 5% within 10 years.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If improvement to 25% has not been achieved by the 5-year mark and <5% by Year 10 then remedial actions to reduce weed cover will be applied. These include refining the weed control methods.

	T1	T2	T3	T4	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data	Raw Data	Raw Data									
Site Condition Score						22.625	47.625	63	88	88			
MAX Site Condition Score						*100*	*100*	*100*	*100*	*100*			
Site Condition Score - out of 4						0.91	1.91	2.52	3.52	3.52			
Size of patch	Patch size is greater than 200ha	Patch size is greater than 200ha	Patch size is greater than 200ha	Patch size is greater than 200ha	10	10	10	10	10	10	NA	NA	NA
Connectedness	No active camps within 20km	No active camps within 20km	No active camps within 20km	No active camps within 20km	0	0	0	0	0	0	NA	NA	NA
Context	31-75%	31-75%	31-75%	31-75%	6	6	6	6	6	6	NA	NA	NA
Ecological Corridors	Partially within an ecological corridor	Partially within an ecological corridor	Partially within an ecological corridor	Partially within an ecological corridor	10	10	10	10	10	10	NA	NA	NA
Role of site location to	0	0	0	0	0	0	0	0	0	0	NA	NA	NA

	T1	T2	T3	T4	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data	Raw Data	Raw Data									
species overall population in the state													
Threats to the species	5	5	5	5	5	5	10	10	10	10	The proposed ROA 3 site is currently utilised for agriculture and therefore contains barbwire fencing which is a recognised threat to flying foxes. With management action 4 and 5 outlined in **Table 4** barbwire fencing will be removed internally where cattle are removed and therefore the assessment unit 'Threats' will reduced to low within 5 years.	Baseline attributes and pest monitoring has been established. This criterium is largely reliant upon the management of barbwire fencing within ROA 3.	The control or removal of barbwire fencing internally within ROA 3 will provide an immediate and large reduction in threats. Further, pest management as outlined previously will continue to reduce potential threats.
Site Context Score						31	36	36	36	36			
MAX Site Context Score						*60*	*60*	*60*	*60*	*60*			

	T1	T2	T3	T4	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data	Raw Data	Raw Data									
Site Context Score - out of 3						1.55	1.80	1.80	1.80	1.80			
GHFF Foraging Tree Density	1	1	1	1	1	1	4	6	8	10	The entirety of the offset is to consist of MNES habitat restoration activities as per management actions 1, 3, 4, 5 & 5 in **Table 4**. These actions will together improve stem densities within AU1 to greater than 200 per hectare by year 20.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Stem densities within the assessment unit is to achieve between 200 – 240 per hectare by year 20. If the stem density does not achieve 120 by year 15 then remedial actions will be applied. These include remedial plantings of stock.
Species Stocking Rate Score						1	4	6	8	10			
MAX Species Stocking Rate Score						*10*	*10*	*10*	*10*	*10*			
Species Stocking Rate Score - out of 3						0.30	1.20	1.80	2.40	3.00			
Total						2.76	4.91	6.12	7.72	8.32			

Table 4: AU2 Management Summary GHFF – Sparse Regrowth RE 12.8.17/12.8.14 (ROA 3)

	T5	T6	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data									
Vegetation Condition	Cat X	Cat X	**5**	**5**	**5**	**5**	**10**	**10**	It is expected that with management actions 1, 3, 4, 5 and 6, outlined in **Table 4** the assessment unit 'Vegetation Condition' will readily attain regrowth status within 15 years and remnant status by Year 20.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	The assessment unit is to reach regrowth status in 15 years and be progressing towards remnant status by 20 years as per VMA definitions, which require 70% of height and 50% of expected cover to be reached. If the vegetation is not progressing toward regrowth status at 10 years, then remedial actions will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Species Richness	5	4	**4.50**	**10**	**10**	**10**	**20**	**20**	It is expected that with management actions 1, 3, 4 & 5 outlined in **Table 4** the assessment unit 'Species Richness' will improve to at least two foraging species by year 5 and seven by year 15 which will then be maintained through to year 20.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Species richness within the assessment unit is to achieve at least three foraging species by year 5 and seven by year 15. If the species diversity does not reflect this requirement at year 10, then remedial actions will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Flower Score	0.606	0.635	**0.62**	**8**	**8**	**8**	**8**	**8**	It is expected that with management actions, 1, 3, 4, 5 &	Baseline Site Condition attributes are established. Photo monitoring and	Flower scores will be maintained by planting winter flowering and foraging species on-site. If an the

	T5	T6	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data									
									6, outlined in **Table 4** the assessment unit 'Flower Score' will increase by Year 5 with the establishment of plantings.	quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	flower score is not maintained, then remedial actions will be applied. These include remedial plantings of advanced stock.
Timing of Biological Shortages	10	10	**10**	**10**	**10**	**10**	**10**	**10**	It is expected that with management actions 1, 3, 4, 5 & 6 outlined in **Table 4** the assessment unit 'Timing of Biological shortages' will improve to cover all shortages based on flora species presence by year 5.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	No biological shortages to be maintained with offset, particularly as planted trees meet semi-mature state (10 years). If the species present do not reflect this requirement at year 10, then remedial actions will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.
Quality of Foraging Habitat	3	3	**3**	**5**	**10**	**10**	**20**	**20**	It is expected that with management actions 1, 3, 4, 5 & 6 outlined in **Table 4** will result in the increase of two foraging habitat tree species by year 5 and seven by year 15 which will then be maintained through to year 20.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Quality of foraging habitat within the assessment unit is to achieve at least two species by year 5 and five by year 15. If the species present do not reflect this requirement at year 10, then remedial actions will be applied. This may include remedial plantings of advanced stock or extending the life of the offset to reach minimum objectives.

	T5	T6	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data									
Non-native Plant Cover	55%	55%	**55%**	1	10	20	20	20	Non-native plant cover within AU2 is moderate. It is anticipated that the weed management actions of 3, 4, 5 and 6 outlined in **Table 4** and following sections of this OMP will improve non-native plant cover to below 5% within 10 years.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	If improvement to 25% has not been achieved by the 5-year mark and <5% by Year 10 then remedial actions to reduce weed cover will be applied. These include refining the weed control methods.
Site Condition Score				39	53	63	88	88			
MAX Site Condition Score				*100*	*100*	*100*	*100*	*100*			
Site Condition Score - out of 4				1.56	2.12	2.52	3.52	3.52			
Size of patch	Patch size is greater than 200ha	Patch size is greater than 200ha	**10**	10	10	10	10	10	NA	NA	NA
Connectedness	No active camps	No active camps	**0**	0	0	0	0	0	NA	NA	NA

	T5	T6	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data									
	within 20km	within 20km									
Context	31-75%	31-75%	**6**	**6**	**6**	**6**	**6**	**6**	NA	NA	NA
Ecological Corridors	Partially within an ecological corridor	Partially within an ecological corridor	**10**	**10**	**10**	**10**	**10**	**10**	NA	NA	NA
Role of site location to species overall population in the state	0	0	**0**	**0**	**0**	**0**	**0**	**0**	NA	NA	NA
Threats to the species	5	5	**5**	**5**	**10**	**10**	**10**	**10**	The proposed ROA 3 site is currently utilised for agriculture and therefore contains barbwire fencing which is a recognised threat to flying foxes. With management action 4 and 5 outlined in **Table 4** barbwire fencing will be removed internally where	Baseline attributes and pest monitoring has been established. This criterium is largely reliant upon the management of barbwire fencing within ROA 3.	The control or removal of barbwire fencing internally within ROA 3 will provide an immediate and large reduction in threats. Further, pest management as outlined previously will continue to reduce potential threats.

	T5	T6	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data									
									cattle are removed and therefore the assessment unit 'Threats' will reduced to low within 5 years.		
Site Context Score				31	36	36	36	36			
MAX Site Context Score				*60*	*60*	*60*	*60*	*60*			
Site Context Score - out of 3				1.55	1.80	1.80	1.80	1.80			
GHFF Foraging Tree Density	5	5	5	2	4	6	8	10	The entirety of the offset is to consist of MNES habitat restoration activities as per management actions 1, 3, 4, 5 & 5 in **Table 4**. These actions will together improve stem densities within AU2 to greater than 569 per hectare by year 20.	Baseline Site Condition attributes are established. Photo monitoring and quadrat monitoring methods to be implemented for Years 1-10. Habitat quality transects to be completed by suitably qualified professionals at 5, 10, 15 and 20 years.	Stem densities within the assessment unit is to achieve between 569-592 per hectare by year 20. If the stem density does not achieve 315 by year 10 then remedial actions will be applied. These include remedial plantings of stock.

	T5	T6	Average Score	AU Score	Year 5 score	Year 10 score	Year 15 score	Year 20 score	Justification / Management Actions / Timing	Monitoring	KPIs and Adaptive Management
	Raw Data	Raw Data									
Species Stocking Rate Score				2	4	6	8	10			
MAX Species Stocking Rate Score				*10*	*10*	*10*	*10*	*10*			
Species Stocking Rate Score - out of 3				0.30	1.20	1.80	2.40	3.00			
Total				3.41	5.12	6.12	7.72	8.32			

APPENDIX B: EPBC OFFSET ASSESSMENT GUIDE CALCULATOR RESULTS

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

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

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

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes		**Area**	18.9	Hectares	
			Quality	**6**	Scale 0-10	
			Total quantum of impact	11.34	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	11.34	Adjusted hectares	ROA 3 - AU1	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	37.9	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	37.9	**Future area with offset (adjusted hectares)**	37.9	0.00	95%	0.00	0.00	12.38	109.18%	Yes	
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**3**	**Future quality without offset (scale of 0-10)**	**3**	**Future quality with offset (scale of 0-10)**	**7**	4.00	85%	3.40	3.27				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	11.34	12.38	109.18%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

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

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

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes		**Area**	18.9	Hectares	
			Quality	**6**	Scale 0-10	
			Total quantum of impact	11.34	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	11.34	Adjusted hectares	ROA 3 - AU2	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	3.4	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%	0.00	95%	0.00	0.00	0.28	2.45%	No	
									Future area without offset (adjusted hectares)	3.4	**Future area with offset (adjusted hectares)**	3.4								
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**6**	**Future quality without offset (scale of 0-10)**	**6**	**Future quality with offset (scale of 0-10)**	**7**	1.00	85%	0.85	0.82				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	11.34	0.28	2.45%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

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

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

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes		**Area**	18.9	Hectares	
			Quality	**6**	Scale 0-10	
			Total quantum of impact	11.34	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	11.34	Adjusted hectares	ROA 3 - AU1	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	37.9	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	37.9	**Future area with offset (adjusted hectares)**	37.9	0.00	95%	0.00	0.00	15.48	136.48%	Yes	
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**3**	**Future quality without offset (scale of 0-10)**	**3**	**Future quality with offset (scale of 0-10)**	**8**	5.00	85%	4.25	4.08				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	11.34	15.48	136.48%	**Yes**	$0.00	N/A	$0.00
Area of community	0				$0.00		$0.00
					$0.00	**$0.00**	**$0.00**

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

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

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

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	Yes		**Area**	18.9	Hectares	
			Quality	**6**	Scale 0-10	
			Total quantum of impact	11.34	Adjusted hectares	
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No					
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				**Risk-related time horizon (max. 20 years)**		**Start area (hectares)**		**Risk of loss (%) without offset**		**Risk of loss (%) with offset**									
									Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.0								
					Time until ecological benefit		**Start quality (scale of 0-10)**		**Future quality without offset (scale of 0-10)**		**Future quality with offset (scale of 0-10)**									
Threatened species habitat																				
Area of habitat	Yes	11.34	Adjusted hectares	ROA 3 - AU2	**Time over which loss is averted (max. 20 years)**	20	**Start area (hectares)**	3.4	**Risk of loss (%) without offset**	0%	**Risk of loss (%) with offset**	0%								
									Future area without offset (adjusted hectares)	3.4	**Future area with offset (adjusted hectares)**	3.4	0.00	95%	0.00	0.00	1.39	12.24%	No	
					Time until ecological benefit	20	**Start quality (scale of 0-10)**	**3**	**Future quality without offset (scale of 0-10)**	**3**	**Future quality with offset (scale of 0-10)**	**8**	5.00	85%	4.25	4.08				
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**		**Start value**		**Future value without offset**		**Future value with offset**		**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	No																			
Condition of habitat Change in habitat condition, but no change in extent	No																			
Threatened species																				
Birth rate e.g. Change in nest success	No																			
Mortality rate e.g Change in number of road kills per year	No																			
Number of individuals e.g. Individual plants/animals	No																			

Summary

Protected matter attributes	Quantum of impact	Net present value of offset	% of impact offset	Direct offset adequate?	Cost ($)		
					Direct offset ($)	Other compensatory measures ($)	Total ($)
Birth rate	0				$0.00		$0.00
Mortality rate	0				$0.00		$0.00
Number of individuals	0				$0.00		$0.00
Number of features	0				$0.00		$0.00
Condition of habitat	0				$0.00		$0.00
Area of habitat	11.34	1.39	12.24%	**No**	$0.00	#DIV/0!	#DIV/0!
Area of community	0				$0.00		$0.00
					$0.00	**#DIV/0!**	**#DIV/0!**

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Swift Parrot
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	**6.8%**

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

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	Yes	Swift Parrot	5094		Count	
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																
Area of community	No				**Risk-related time horizon (max. 20 years)**	**Start area (hectares)**	**Risk of loss (%) without offset**	**Risk of loss (%) with offset**								
							Future area without offset (adjusted hectares) 0.0	**Future area with offset (adjusted hectares)** 0.0								
					Time until ecological benefit	**Start quality (scale of 0-10)**	**Future quality without offset (scale of 0-10)**	**Future quality with offset (scale of 0-10)**								
Threatened species habitat																
Area of habitat	No				**Time over which loss is averted (max. 20 years)**	**Start area (hectares)**	**Risk of loss (%) without offset** 0%	**Risk of loss (%) with offset** 0%								
							Future area without offset (adjusted hectares) 0.0	**Future area with offset (adjusted hectares)** 0.0								
					Time until ecological benefit	**Start quality (scale of 0-10)**	**Future quality without offset (scale of 0-10)**	**Future quality with offset (scale of 0-10)**								
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**	**Start value**	**Future value without offset**	**Future value with offset**	**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	Yes	5094	Count	ROA 3 and ROA 4	20	1547	1547	36017	34470	85%	29299.50	7860.23	154.30%	Yes		
Condition of habitat Change in habitat condition, but no change in extent	No															
Threatened species																
Birth rate e.g. Change in nest success	No															
Mortality rate e.g Change in number of road kills per year	No															
Number of individuals e.g. Individual plants/animals	No															

Offsets Assessment Guide

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

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Regent Honeyeater
EPBC Act status	Critically Endangered
Annual probability of extinction Based on IUCN category definitions	**6.8%**

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

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat	No		**Area**			
			Quality			
			Total quantum of impact	0.00		
Protected matter attributes	**Attribute relevant to case?**	**Description**	**Quantum of impact**		**Units**	**Information source**
Number of features e.g. Nest hollows, habitat trees	Yes	Regent Honeyeater	4647		Count	
Condition of habitat Change in habitat condition, but no change in extent	No					
Threatened species						
Birth rate e.g. Change in nest success	No					
Mortality rate e.g Change in number of road kills per year	No					
Number of individuals e.g. Individual plants/animals	No					

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)	Start area and quality	Future area and quality without offset	Future area and quality with offset	Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																
Area of community	No				**Risk-related time horizon (max. 20 years)**	**Start area (hectares)**	**Risk of loss (%) without offset**	**Risk of loss (%) with offset**								
							Future area without offset (adjusted hectares) 0.0	**Future area with offset (adjusted hectares)** 0.0								
					Time until ecological benefit	**Start quality (scale of 0-10)**	**Future quality without offset (scale of 0-10)**	**Future quality with offset (scale of 0-10)**								
Threatened species habitat																
Area of habitat	No				**Time over which loss is averted (max. 20 years)**	**Start area (hectares)**	**Risk of loss (%) without offset** 0%	**Risk of loss (%) with offset** 0%								
							Future area without offset (adjusted hectares) 0.0	**Future area with offset (adjusted hectares)** 0.0								
					Time until ecological benefit	**Start quality (scale of 0-10)**	**Future quality without offset (scale of 0-10)**	**Future quality with offset (scale of 0-10)**								
Protected matter attributes	**Attribute relevant to case?**	**Total quantum of impact**	**Units**	**Proposed offset**	**Time horizon (years)**	**Start value**	**Future value without offset**	**Future value with offset**	**Raw gain**	**Confidence in result (%)**	**Adjusted gain**	**Net present value**	**% of impact offset**	**Minimum (90%) direct offset requirement met?**	**Cost ($ total)**	**Information source**
Number of features e.g. Nest hollows, habitat trees	Yes	4647	Count	ROA 3 and ROA 4	20	0	0	20692	20692	85%	17588.20	4718.42	101.54%	Yes		
Condition of habitat Change in habitat condition, but no change in extent	No															
Threatened species																
Birth rate e.g. Change in nest success	No															
Mortality rate e.g Change in number of road kills per year	No															
Number of individuals e.g. Individual plants/animals	No															

APPENDIX C: SUITABLY QUALIFIED FIELD ECOLOGIST – CURRICULUM VITAE

David Havill - Principal Ecologist

David Havill has significant practical experience in the areas of ecological site assessments (flora and fauna), weed management programs, large scale revegetation projects, wetland rehabilitation and waterway restoration. He has a strong understanding of the intricate workings of the *Vegetation Management Act 1999* and the complex codes and policies which influence site vegetation constraints. David's expertise relates to the on-site identification and spatial mapping of fauna and flora species including endangered, rare and vulnerable plants and animals. He has an accurate understanding of site survey processes and standards developed by the State and Commonwealth Governments. This provides the ability to challenge the various inaccuracies that occur within broad scale vegetation mapping developed by these Government agencies. David works closely with our in-house team of GIS, environmental planning, and landscape rehabilitation specialists to document findings of ecological survey and prepare targeted restoration and rehabilitation strategies. He has a strong understanding of construction techniques associated with development projects and has the ability to prepare practical flora and fauna management plans to assist in guiding the construction process within sensitive areas.

Qualifications

– Diploma of Arboriculture, Training for Trees Pty Ltd, #04453

– Bachelor of Applied Science (Natural Systems and Wildlife Management), The University of Queensland

APPENDIX D: HABITAT QUALITY RAW DATA

Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	1	Job Number / Property	7399 - Peninsula Offset

Part B - Site Data

Recorders	David Havill	Date	2.11.2023

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1		Non-remnant RE12.3.3	12

Site description and Location (including details of discrete polygons within the assessment unit)
Transect 1 located in the eastern portion of Lot 1 on CC3571, south of Moorang Lane, Moorang. The transect is located in the floodplain area associated with the Bremer River. The site is mapped as non-remnant vegetation and has historically been managed for cattle and is mostly cleared of all woody vegetation. Regrowth vegetation within the shrub layer appears to be dependant upon head of cattle and conditions of grazing. The paddock areas are fenced, contain constructed dams, some scttered vegetation and regrowith amongst large open paddocks. Evidence of pig damage noted. Preclear Regional Ecosystem mapping has the site mapped as containing an composite Endangered RE containing 90% Endangered RE12.3.3 and 10% Least Concern Re12.3.7. The transect is located in conditions suitable to Endangered RE12.3.3.

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	0			EDL / Dom / R
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	1		
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	2		
Scientific Name	*Heteropogon contortus*	Common Name	Black Spear Grass
Scientific Name	*Dicanthium sericeum*	Common Name	Silky Blue Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	0		
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	95.00%		
Scientific Name	*Setaria sphacelata*	**Common Name**	South African Pigeon Grass
Scientific Name	*Senecio madagascariensis*	**Common Name**	Fireweed
Scientific Name	*Gomphocarpus physocarpus*	**Common Name**	Balloon Cotton Bush
Scientific Name	*Lantana camara*	**Common Name**	Lantana
Scientific Name	*Chloris gayana*	**Common Name**	Rhodes Grass
Scientific Name	*Ambrosia artemisiifolia*	**Common Name**	Annual Ragweed
Scientific Name	*Verbena bonariensis*	**Common Name**	Purpletop
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	**0.00**		
1	0.00	**26**	
2		**27**	
3		**28**	
4		**29**	
5		**30**	
6		**31**	
7		**32**	
8		**33**	
9		**34**	
10		**35**	
11		**36**	
12		**37**	
13		**38**	
14		**39**	
15		**40**	
16		**41**	
17		**42**	
18		**43**	
19		**44**	
20		**45**	
21		**46**	
22		**47**	
23		**48**	
24		**49**	
25		**50**	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	0%	5%	5%	0%	8%	4%
Native other grass	0%	0%	0%	0%	0%	0%
Native forbs and other species	0%	0%	5%	0%	0%	1%
Native shrubs	0%	0%	0%	0%	0%	0%
Non-native grass	94%	78%	45%	50%	92%	72%
Non native forbs and shrubs	0%	2%	5%	5%	0%	2%
Litter	0%	0%	0%	0%	0%	0%
Rock	0%	0%	0%	0%	0%	0%
Bare Ground	6%	15%	45%	45%	0%	22%
Cryptogram	0%	0%	0%	0%	0%	0%
Total	100%	100%	105%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	540	**Number of large eucalypt trees:**	0
Non- Eucalypt Large tree DBH benchmark used:	200	**Number of large non eucalypt trees:**	0
Total number of large trees recorded:	0		
Total Number Large Trees per ha:	0		

Median Tree Canopy Height Measurements	**Canopy:**	NA	**Sub-canopy:**	NA	**Emergent:**	NA

Percentage of ecologically dominant layer species regenerating:	**0.00**

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	0.0%	Sub-canopy:	0.00%	Emergent:	NA
Shrub canopy cover %	1.10%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub	0.0	0.7	0.7	Shrub			0.0
Shrub	83.6	84.0	0.4	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
	Nil
TOTAL	0

Attach Landscape Photos Here

North



South



East



West



Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	2	Job Number / Property	7399 - Peninsula Offset

Part B - Site Data

Recorders	David Havill	Date	2.11.2023

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1		Non-remnant RE12.3.3	12

Site description and Location (including details of discrete polygons within the assessment unit)
Transect 2 located in the eastern portion of Lot 1 on CC3571, south of Moorang Lane, Moorang. The transect is loctaed in the floodplain area associated with the Bremer River. The site is mapped as non-remnant vegetation and has historically been managed for cattle and is mostly cleared of all woody vegetation. Some regrowth vegetaion within the westren portion of the transect area. The paddock areas are fenced, contain constrcuted dams, some scttered vegetation and regrowith amongst large open paddocks. Evidence of pig damage noted. Conditions very dry, with no native forbs identified. Preclear Regional Ecosystem mapping has the site mapped as containing an composite Endangered RE containing 90% Endangered RE12.3.3 and 10% Least Concern Re12.3.7. The transect is located in conditions suitable to Endangered RE12.3.3.

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	2			EDL / Dom / R
Scientific Name	*Eucalyptus moluccana*	Common Name	Gum Topped Box	Dom / r
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum	r
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	0		
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	3		
Scientific Name	*Eragrostis brownii*	Common Name	Browns Love Grass
Scientific Name	*Dicanthium sericeum*	Common Name	Silky Blue Grass
Scientific Name	*Cynondon dactylon*	Common Name	Green Couch
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	0		
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	75.00%		
Scientific Name	*Setaria sphacelata*	Common Name	South African Pigeon Grass
Scientific Name	*Senecio madagascariensis*	Common Name	Fireweed
Scientific Name	*Gomphocarpus physocarpus*	Common Name	Balloon Cotton Bush
Scientific Name	*Lantana camara*	Common Name	Lantana
Scientific Name	*Chloris gayana*	Common Name	Rhodes Grass
Scientific Name	*Ambrosia artemisiifolia*	Common Name	Annual Ragweed
Scientific Name	*Macroptilium lathyroides*	Common Name	Phasey Bean
Scientific Name	*Cirsium vulgare*	Common Name	Spear Thistle
Scientific Name	*Gomphrena celosioides*	Common Name	Gomphrena
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	0.00		
1	0.00	26	
2		27	
3		28	
4		29	
5		30	
6		31	
7		32	
8		33	
9		34	
10		35	
11		36	
12		37	
13		38	
14		39	
15		40	
16		41	
17		42	
18		43	
19		44	
20		45	
21		46	
22		47	
23		48	
24		49	
25		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	35%	70%	50%	75%	35%	53%
Native other grass	0%	0%	0%	0%	0%	0%
Native forbs and other species	0%	0%	0%	0%	0%	0%
Native shrubs	10%	0%	0%	0%	0%	2%
Non-native grass	20%	27%	0%	15%	50%	22%
Non native forbs and shrubs	0%	3%	10%	5%	5%	5%
Litter	0%	0%	0%	0%	0%	0%
Rock	0%	0%	0%	0%	0%	0%
Bare Ground	35%	0%	40%	5%	10%	18%
Cryptogram	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	540	Number of large eucalypt trees:	0
Non- Eucalypt Large tree DBH benchmark used:	200	Number of large non eucalypt trees:	0
Total number of large trees recorded:	0		
Total Number Large Trees per ha:	0		

Median Tree Canopy Height Measurements	Canopy:	NA	Sub-canopy:	NA	Emergent:	NA

Percentage of ecologically dominant layer species regenerating:	0.00

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	0.0%	Sub-canopy:	10.90%	Emergent:	NA
Shrub canopy cover %	1.60%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1			0.0	T2	0.0	2.2	2.2
T1			0.0	T2	11.1	13.7	2.6
T1			0.0	T2	13.7	15.8	2.1
T1			0.0	T2	28.5	30.0	1.5
T1			0.0	T2	33.2	35.7	2.5
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub	4.8	6.0	1.2	Shrub			0.0
Shrub	24.2	24.6	0.4	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Eucalyptus moluccana	4
Eucalyptus tereticornis	1
TOTAL	5

Attach Landscape Photos Here

North



South



East



West



Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	3	Job Number / Property	7399 - Peninsula Offset

Part B - Site Data

Recorders	David Havill	Date	2.11.2023

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1		Non-remnant RE12.3.3	12

Site description and Location (including details of discrete polygons within the assessment unit)
Transect 3 located in the eastern portion of Lot 1 on CC3571, south of Moorang Lane, Moorang. The transect is loctaed in the floodplain area associated with the Bremer River. The site is mapped as non-remnant vegetation and has historically been managed for cattle and is mostly cleared of all woody vegetation. Regrowth vegetation within the shrub layer appears to be dependant upon head of cattle and conditions of grazing. The paddock areas are fenced, contain constructed dams, some scttered vegetation and regrowith amongst large open paddocks. Evidence of pig damage noted. Preclear Regional Ecosystem mapping has the site mapped as containing an composite Endangered RE containing 90% Endangered RE12.3.3 and 10% Least Concern Re12.3.7. The transect is located in conditions suitable to Endangered RE12.3.3.

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	0			EDL / Dom / R
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	0		
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	2		
Scientific Name	*Heteropogon contortus*	Common Name	Black Spear Grass
Scientific Name	*Dicanthium sericeum*	Common Name	Silky Blue Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	0		
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	85.00%		
Scientific Name	*Setaria sphacelata*	**Common Name**	South African Pigeon Grass
Scientific Name	*Senecio madagascariensis*	**Common Name**	Fireweed
Scientific Name	*Gomphocarpus physocarpus*	**Common Name**	Balloon Cotton Bush
Scientific Name	*Bidens pilosa*	**Common Name**	Cobblers Pegs
Scientific Name	*Chloris gayana*	**Common Name**	Rhodes Grass
Scientific Name	*Ambrosia artemisiifolia*	**Common Name**	Annual Ragweed
Scientific Name	*Verbena bonariensis*	**Common Name**	Purpletop
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	**0.00**		
1	0.00	**26**	
2		**27**	
3		**28**	
4		**29**	
5		**30**	
6		**31**	
7		**32**	
8		**33**	
9		**34**	
10		**35**	
11		**36**	
12		**37**	
13		**38**	
14		**39**	
15		**40**	
16		**41**	
17		**42**	
18		**43**	
19		**44**	
20		**45**	
21		**46**	
22		**47**	
23		**48**	
24		**49**	
25		**50**	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	0%	0%	5%	5%	10%	4%
Native other grass	0%	0%	0%	0%	0%	0%
Native forbs and other species	0%	0%	0%	0%	0%	0%
Native shrubs	0%	0%	0%	0%	0%	0%
Non-native grass	97%	93%	93%	85%	40%	82%
Non native forbs and shrubs	3%	3%	2%	3%	5%	3%
Litter	0%	0%	0%	0%	0%	0%
Rock	0%	0%	0%	0%	0%	0%
Bare Ground	0%	4%	0%	7%	45%	11%
Cryptogram	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	540	**Number of large eucalypt trees:**	0
Non- Eucalypt Large tree DBH benchmark used:	200	**Number of large non eucalypt trees:**	0
Total number of large trees recorded:	0		
Total Number Large Trees per ha:	0		

Median Tree Canopy Height Measurements	**Canopy:**	NA	**Sub-canopy:**	4	**Emergent:**	NA

Percentage of ecologically dominant layer species regenerating:	**0.00**

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	0.0%	Sub-canopy:	0.00%	Emergent:	NA
Shrub canopy cover %	0.60%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub	8.5	9.1	0.6	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
	Nil
TOTAL	0

Attach Landscape Photos Here

North



South



East



West



Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	4	Job Number / Property	7399 - Peninsula Offset

Part B - Site Data

Recorders	David Havill	Date	2.11.2023

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
1		Non-remnant RE12.3.3	12

Site description and Location (including details of discrete polygons within the assessment unit)
Transect 4 located in the eastern portion of Lot 1 on CC3571, south of Moorang Lane, Moorang. The transect is loctaed in the floodplain area associated with the Bremer River. The site is mapped as non-remnant vegetation and has historically been managed for cattle and is mostly cleared of all woody vegetation. Regrowth vegetation within the shrub layer appears to be dependant upon head of cattle and conditions of grazing. The paddock areas are fenced, contain constructed dams, some scttered vegetation and regrowith amongst large open paddocks. Evidence of pig damage noted. Preclear Regional Ecosystem mapping has the site mapped as containing an composite Endangered RE containing 90% Endangered RE12.3.3 and 10% Least Concern Re12.3.7. The transect is located in conditions suitable to Endangered RE12.3.3.

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	3			EDL / Dom / R
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum	Dom / R
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash	R
Scientific Name	*Eucalyptus melanophloia*	Common Name	Silver Leaf Ironbark	
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	0		
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	5		
Scientific Name	*Heteropogon contortus*	Common Name	Black Spear Grass
Scientific Name	*Dicanthium sericeum*	Common Name	Silky Blue Grass
Scientific Name	*Imperata cylindrica*	Common Name	Blady Grass
Scientific Name	*Cymbopogon refractus*	Common Name	Barbed Wire Grass
Scientific Name	*Cynondon dactylon*	Common Name	Green Couch
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	5		
Scientific Name	*Wahlenbergia gracilis*	Common Name	Bluebell
Scientific Name	*Juncus usiatatus*	Common Name	Common Rush
Scientific Name	*Fimbristylis ferruginea*	Common Name	A Fringe Rush
Scientific Name		Common Name	Pink Wheel
Scientific Name		Common Name	Native White Daisy
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	25.00%		
Scientific Name	*Lantana camara*	**Common Name**	Lantana
Scientific Name	*Senecio madagascariensis*	**Common Name**	Fireweed
Scientific Name	*Verbena bonariensis*	**Common Name**	Purple Top
Scientific Name	*Chloris gayana*	**Common Name**	Rhodes Grass
Scientific Name	*Cyperus polystachyos*	**Common Name**	Bunchy Sedge
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	
Scientific Name		**Common Name**	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	**85.00**		
1	1.40	**26**	
2	0.60	**27**	
3	2.20	**28**	
4	3.60	**29**	
5	2.10	**30**	
6		**31**	
7		**32**	
8		**33**	
9		**34**	
10		**35**	
11		**36**	
12		**37**	
13		**38**	
14		**39**	
15		**40**	
16		**41**	
17		**42**	
18		**43**	
19		**44**	
20		**45**	
21		**46**	
22		**47**	
23		**48**	
24		**49**	
25		**50**	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	0%	0%	5%	5%	10%	4%
Native other grass	0%	0%	0%	0%	0%	0%
Native forbs and other species	0%	0%	0%	0%	0%	0%
Native shrubs	0%	0%	0%	0%	0%	0%
Non-native grass	97%	93%	93%	85%	40%	82%
Non native forbs and shrubs	3%	3%	2%	3%	5%	3%
Litter	0%	0%	0%	0%	0%	0%
Rock	0%	0%	0%	0%	0%	0%
Bare Ground	0%	4%	0%	7%	45%	11%
Cryptogram	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	540	**Number of large eucalypt trees:**	*Eucalyptus tereticornis* (Forest Red Gum) = 620mm, 890mm, 620mm, 1010mm. (Total = 4)
Non- Eucalypt Large tree DBH benchmark used:	200	**Number of large non eucalypt trees:**	0
Total number of large trees recorded:	4		
Total Number Large Trees per ha:	8		

Median Tree Canopy Height Measurements	**Canopy:**	26	**Sub-canopy:**	7	**Emergent:**	NA

Percentage of ecologically dominant layer species regenerating:	**66.67**

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	38.0%	Sub-canopy:	14.70%	Emergent:	NA
Shrub canopy cover %	5.00%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1	0.0	19.6	19.6	T2	0.0	2.0	2.0
T1	47.3	65.7	18.4	T2	11.2	13.4	2.2
T1			0.0	T2	28.2	29.6	1.4
T1			0.0	T2	39.0	43.1	4.1
T1			0.0	T2	44.7	47.3	2.6
T1			0.0	T2	53.0	55.4	2.4
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0
T1			0.0	T2			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub	23.3	24.8	1.5	Shrub			0.0
Shrub	37.6	38.1	0.5	Shrub			0.0
Shrub	51.7	52.3	0.6	Shrub			0.0
Shrub	66.7	67.3	0.6	Shrub			0.0
Shrub	73.0	73.6	0.6	Shrub			0.0
Shrub	81.1	81.6	0.5	Shrub			0.0
Shrub	99.3	100.0	0.7	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0
Shrub			0.0	Shrub			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Eucalyptus tereticornis	23
Eucalyptus melanophloia	1
Corymbia tessellaris	6
TOTAL	30

Attach Landscape Photos Here

North



South



East



West



Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	5 (originally 8)	Job Number / Property	7399 - Peninsula Offset

Part B - Site Data

Recorders	David Havill & Harry Cormack	Date	1.10.2025

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
2		Non-remnant RE12.8.17/12.8.14	12

Site description and Location (including details of discrete polygons within the assessment unit)

Transect 8 located in the southern portion of Lot 1 on CC3571 within mapped non-remnant (Category X) vegetation. Preclear regional ecosystem mapping contains a composite Regional Ecosystem community containing 80% Least Concern RE12.8.17 and 20% Least Concern RE12.8.14. Vegetation assessed at the transect is dominated by the Least Concern RE12.8.17 described as a *mixed woodland with combinations of Eucalyptus crebra, Eucalyptus melanophloia, Eucalyptus tereticornis, Corymbia tessellaris, Corymbia intermedia woodland on Cainozoic igneous rocks* . The plot alignment direction is approximately 262° W with the canopy vegetation dominated by *Eucalyptus crebra* (Narrow Leaf Ironbark). The shrub layer was relatively sparse however recruitment of canopy species was recorded.

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	5			EDL / Dom / R
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow Leaf Ironbark	EDL / Dom / R
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum	EDL /R
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash	EDL /R
Scientific Name	*Corymbia intermedia*	Common Name	Pink Bloodwood	EDL / R
Scientific Name	*Eucalyptus melanophloia*	Common Name	Silver Leaf Ironbark	EDL / R
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	4		
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow Leaf Ironbark
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum
Scientific Name	*Corymbia intermedia*	Common Name	Pink Bloodwood
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	4		
Scientific Name	*Heteropogon contortus*	Common Name	Black Spear Grass
Scientific Name	*Cynondon dactylon*	Common Name	Green Couch
Scientific Name	*Aristida stricta*	Common Name	Threeawn Wiregrass
Scientific Name	*Eragrostis brownii*	Common Name	Browns Love Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	6		
Scientific Name	*Lomandra multiflora*	Common Name	Many Flowered Mat Rush
Scientific Name	*Dianella caerulea*	Common Name	Blue Flax Lily
Scientific Name	*Glycine clandestina*	Common Name	Twining Glycine
Scientific Name	*Lomandra longifolia*	Common Name	Mat Rush
Scientific Name	*Lobelia purpurascens*	Common Name	White Root
Scientific Name	*Chrysocephalum apiculatum*	Common Name	Yellow Buttons
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	55.00%		
Scientific Name	*Senecio madagascariensis*	Common Name	Fireweed
Scientific Name	*Gomphocarpus physocarpus*	Common Name	Balloon Cotton Bush
Scientific Name	*Lantana camara*	Common Name	Lantana
Scientific Name	*Ambrosia artemisiifolia*	Common Name	Annual Rag Weed
Scientific Name	*Ageratum houstonianum*	Common Name	Blue Billygoat Weed
Scientific Name	*Melinis repens*	Common Name	Red Natal Grass
Scientific Name	*Conyza sumatrensis*	Common Name	Tall Fleabane
Scientific Name	*Passiflora foetida*	Common Name	Stinking Passion Flower
Scientific Name	*Verbena bonariensis*	Common Name	Purple Top Vervain
Scientific Name	*Celtis sinensis*	Common Name	Chinese Elm
Scientific Name	*Chloris gayana*	Common Name	Rhodes Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	177.00		
1	1.60	26	
2	2.20	27	
3	2.80	28	
4	2.00	29	
5	1.20	30	
2	5.60	31	
3	2.10	32	
4	0.50	33	
5	1.30	34	
6		35	
3		36	
4		37	
5		38	
6		39	
7		40	
4		41	
5		42	
6		43	
7		44	
8		45	
5		46	
6		47	
7		48	
8		49	
9		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	40%	20%	40%	60%	50%	42%
Native other grass	0%	0%	0%	0%	0%	0%
Native forbs and other species	5%	0%	0%	0%	0%	1%
Native shrubs	5%	0%	0%	0%	0%	1%
Non-native grass	30%	10%	0%	10%	50%	20%
Non native forbs and shrubs	0%	40%	30%	15%	0%	17%
Litter	20%	20%	30%	10%	0%	16%
Rock	0%	0%	0%	0%	0%	0%
Bare Ground	0%	0%	0%	5%	0%	1%
Cryptogram	0%	0%	0%	0%	0%	0%
Total	100%	90%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Number of large eucalypt trees:	*Eucalyptus crebra = 540mm, 490mm (Total 2)*
Non- Eucalypt Large tree DBH benchmark used:	NA	Number of large non eucalypt trees:	0
Total number of large trees recorded:	2		
Total Number Large Trees per ha:	4		

Median Tree Canopy Height Measurements	Canopy:	19	Sub-canopy:	8	Emergent:	NA

Percentage of ecologically dominant layer species regenerating:	100.00

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	8.5%	Sub-canopy:	38.60%	Emergent:	NA
Shrub canopy cover %	2.20%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1 *Eucalyptus crebra*	9.8	18.3	8.5	**T2** *Eucalyptus crebra*	3.6	5.7	2.1

T1			0.0	**T2** *Eucalyptus crebra*	14.9	17.8	2.9
T1			0.0	**T2** *Eucalyptus tereticornis*	20.9	24.6	3.7
T1			0.0	**T2** *Eucalyptus crebra*	25.6	27.1	1.5
T1			0.0	**T2** *Eucalyptus tereticornis*	27.1	30.2	3.1
T1			0.0	**T2** *Eucalyptus tereticornis*	33.4	35.5	2.1
T1			0.0	**T2** *Corymbia intermedia*	38.6	41.5	2.9
T1			0.0	**T2** *Eucalyptus tereticornis*	42.7	46.4	3.7
T1			0.0	**T2** *Eucalyptus tereticornis*	57.4	59.3	1.9
T1			0.0	**T2** *Corymbia tesselaris*	60.5	62.5	2.0
T1			0.0	**T2** *Eucalyptus crebra*	64.4	66.5	2.1
T1			0.0	**T2** *Eucalyptus tereticornis*	66.5	71.5	5.0
T1			0.0	**T2** *Corymbia intermedia*	83.6	87.5	3.9
T1			0.0	**T2** *Eucalyptus crebra*	94.5	96.2	1.7
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub *Eucalyptus crebra*	16.9	17.6	0.7	**Shrub**			0.0
Shrub *Eucalyptus tereticornis*	23.3	24.1	0.8	**Shrub**			0.0
Shrub *Corymbia tessellaris*	52.4	53.1	0.7	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Eucalyptus tereticornis	31
Eucalyptus crebra	31
Corymbia intermedia	15
Corymbia tessellaris	9
TOTAL	**86**

Part J: SAT Survey Results

SAT Survey ID	SAT @ Transect 8			
Tree Number	**Scientific Name**	**Common Name**	**DBH**	**Scat (Y/N)**
1	*Eucalyptus tereticornis*	Forest Red Gum	260	Nil
2	*Eucalyptus crebra*	Narrow Leaf Ironbark	180	Nil
3	*Corymbia intermedia*	Pink Bloodwood	160/150	Scats
4	*Corymbia intermedia*	Pink Bloodwood	150	Nil
5	*Corymbia intermedia*	Pink Bloodwood	180	Nil
6	*Corymbia intermedia*	Pink Bloodwood	170	Nil
7	*Eucalyptus crebra*	Narrow Leaf Ironbark	160/140	Nil
8	*Eucalyptus crebra*	Narrow Leaf Ironbark	170	Nil
9	*Corymbia intermedia*	Pink Bloodwood	150/120	Nil
10	*Eucalyptus crebra*	Narrow Leaf Ironbark	110	Nil
11	*Eucalyptus tereticornis*	Forest Red Gum	210	Scats
12	*Corymbia intermedia*	Pink Bloodwood	140	Nil
13	*Corymbia intermedia*	Pink Bloodwood	170	Nil
14	*Corymbia tessellaris*	Moreton Bay Ash	100	Nil
15	*Corymbia intermedia*	Pink Bloodwood	130	Nil
16	*Eucalyptus crebra*	Narrow Leaf Ironbark	180	Nil
17	*Corymbia intermedia*	Pink Bloodwood	130	Nil
18	*Eucalyptus tereticornis*	Forest Red Gum	160	Nil
19	*Eucalyptus crebra*	Narrow Leaf Ironbark	110	Nil
20	*Eucalyptus tereticornis*	Forest Red Gum	130	Nil
21	*Corymbia intermedia*	Pink Bloodwood	140	Scats
22	*Eucalyptus tereticornis*	Forest Red Gum	310	Nil
23	*Corymbia tessellaris*	Moreton Bay Ash	100	Nil
24	*Eucalyptus crebra*	Narrow Leaf Ironbark	130	Nil
25	*Eucalyptus tereticornis*	Forest Red Gum	110/100	Nil
26	*Eucalyptus crebra*	Narrow Leaf Ironbark	140	Nil
27	*Corymbia tessellaris*	Moreton Bay Ash	100	Nil
28	*Eucalyptus tereticornis*	Forest Red Gum	160	Nil
29	*Eucalyptus tereticornis*	Forest Red Gum	170	Nil
30	*Eucalyptus tereticornis*	Forest Red Gum	120	Nil
Total (Trees out of 30)				3
Total Percentage (%)				10
Total (Based on East Coast Medium)				Low

Attach Landscape Photos Here

North



South



East



West



Habitat Quality Assessment Unit Score Sheet

Part A - Administrative

Transect ID	6 (originally 9)	Job Number / Property	7399 - Peninsula Offset

Part B - Site Data

Recorders	David Havill & Harry Cormack	Date	1.10.2025

Assessment Unit:	Assessment Unit Area (ha)	RE	Bioregion Number
2		Non-remnant RE12.8.17/12.8.14	12

Site description and Location (including details of discrete polygons within the assessment unit)

Transect 9 located in the southern portion of Lot 1 on CC3571 within mapped non-remnant (Category X) vegetation. Preclear regional ecosystem mapping contains a composite Regional Ecosystem community containing 80% Least Concern RE12.8.17 and 20% Least Concern RE12.8.14. Vegetation assessed at the transect is dominated by the Least Concern RE12.8.17 described as a *mixed woodland with combinations of Eucalyptus crebra, Eucalyptus melanophloia, Eucalyptus tereticornis, Corymbia tessellaris, Corymbia intermedia woodland on Cainozoic igneous rocks* . The plot alignment direction is approximately 262° W with the canopy vegetation dominated by *Eucalyptus crebra* (Narrow Leaf Ironbark). The shrub layer was relatively sparse however recruitment of canopy species was recorded.

Part C - Native Species Richness: (*list species below)

Tree species richness:				
Total number of species	3			EDL / Dom / R
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum	EDL / Dom / R
Scientific Name	*Corymbia tessellaris*	Common Name	Moreton Bay Ash	EDL / R
Scientific Name	*Corymbia intermedia*	Common Name	Pink Bloodwood	
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		
Scientific Name		Common Name		

Shrub species richness:			
Total number of species	3		
Scientific Name	*Eucalyptus tereticornis*	Common Name	Forest Red Gum
Scientific Name	*Corymbia intermedia*	Common Name	Pink Bloodwood
Scientific Name	*Eucalyptus crebra*	Common Name	Narrow Leaf Ironbark
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Grass species richness:			
Total number of species	4		
Scientific Name	*Heteropogon contortus*	Common Name	Black Spear Grass
Scientific Name	*Eragrostis brownii*	Common Name	Brown's Love Grass
Scientific Name	*Cynondon dactylon*	Common Name	Green Couch
Scientific Name	*Themeda triandra*	Common Name	Kangaroo Grass
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Forbs and others (non grass ground) species richness:			
Total number of species	3		
Scientific Name	*Juncus usitatus*	Common Name	Common Rush
Scientific Name	*Wahlenbergia stricta*	Common Name	Australian Bluebell
Scientific Name	*Dianella caerulea*	Common Name	Blue Flax Lily
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	
Scientific Name		Common Name	

Part D - Non-Native Plant Cover: (*list species below)

Total percentage cover within plot	55.00%		
Scientific Name	*Verbena bonariensiss*	Common Name	Purple Top Vervain
Scientific Name	*Heliotropium amplexicaule*	Common Name	Blue Heliotrope
Scientific Name	*Ambrosia artemisifolia*	Common Name	Annual Rag Weed
Scientific Name	*Melinis repens*	Common Name	Red Natal Grass
Scientific Name	*Chloris gayana*	Common Name	Rhodes Grass
Scientific Name	*Sida cordifolia*	Common Name	Flannel Weed
Scientific Name	*Senecio madagascariensis*	Common Name	Fireweed
Scientific Name	*Lantana camara*	Common Name	Lantana
Scientific Name	*Solanum nigrum*	Common Name	Black Berry Nightshade
Scientific Name	*Gomphocarpus physocarpus*	Common Name	Balloon Cotton Bush
Scientific Name	*Conyza sumatrensis*	Common Name	Tall Fleabane
Scientific Name	*Sporobolus pyramidalis*	Common Name	Rats Tail Grass
Scientific Name	*Bidens pilosa*	Common Name	Cobbler's Pegs
Scientific Name	*Lobelia concolor*	Common Name	Poison Pratia

Part E - Coarse Woody Debris: (*list lengths of individual logs in meters)

Total Length of Course Woody Debris (Meters per hectare)	167.00		
1	3.50	26	
2	2.10	27	
3	0.90	28	
4	1.40	29	
5	1.30	30	
2	2.80	31	
3	4.00	32	
4	1.60	33	
5	1.50	34	
6	1.10	35	
3		36	
4		37	
5		38	
6		39	
7		40	
4		41	
5		42	
6		43	
7		44	
8		45	
5		46	
6		47	
7		48	
8		49	
9		50	

Part F - Native perennial grass cover, organic litter: (*provide percentage cover within each quadrat, and provide average cover)

Ground Cover	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Quadrat 5	Average
Native perennial grass cover	75%	15%	85%	55%	5%	47%
Native other grass	0%	0%	0%	0%	0%	0%
Native forbs and other species	0%	0%	0%	0%	0%	0%
Native shrubs	0%	40%	0%	0%	0%	8%
Non-native grass	10%	0%	0%	0%	0%	2%
Non native forbs and shrubs	15%	45%	15%	35%	80%	38%
Litter	0%	0%	0%	10%	15%	5%
Rock	0%	0%	0%	0%	0%	0%
Bare Ground	0%	0%	0%	0%	0%	0%
Cryptogram	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%

Part G- Number of large trees , tree canopy height, recruitment of woody perennial species:

Eucalypt Large tree DBH benchmark used :	380	Number of large eucalypt trees:	0
Non- Eucalypt Large tree DBH benchmark used:	NA	Number of large non eucalypt trees:	0
Total number of large trees recorded:	0		
Total Number Large Trees per ha:	0		

Median Tree Canopy Height Measurements	Canopy:	na	Sub-canopy:	9	Emergent:	NA

Percentage of ecologically dominant layer species regenerating:	100.00

Part H - Tree canopy cover, Shrub canopy cover

Tree canopy cover %	Canopy:	0.0%	Sub-canopy:	23.00%	Emergent:	NA
Shrub canopy cover %	1.30%					

Layer	Start	End	Interval	Layer	Start	End	Interval
T1			0.0	T2 *Eucalyptus tereticornis*	0.0	5.1	5.1

T1			0.0	**T2** *Eucalyptus tereticornis*	44.7	49.4	4.7
T1			0.0	**T2** *Eucalyptus crebra*	54.4	57.6	3.2
T1			0.0	**T2** *Eucalyptus tereticornis*	71.1	76.7	5.6
T1			0.0	**T2** *Eucalyptus crebra*	82.4	85.0	2.6
T1			0.0	**T2** *Eucalyptus crebra*	95.7	97.5	1.8
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0
T1			0.0	**T2**			0.0

Layer	Start	End	Interval	Layer	Start	End	Interval
Shrub *Eucalyptus tereticornis*	7.9	8.6	0.7	**Shrub**			0.0
Shrub *Eucalyptus tereticornis*	27.0	27.6	0.6	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0
Shrub			0.0	**Shrub**			0.0

Note: Only assess Emergent (E) or Subcanopy (S) layers if the benchmark document stipulates that layers are present *If trees are in the same layer and continuous along the transect you can group them

Part I: GHFF Stem Count

Species Name	Stem Count
Eucalyptus tereticornis	20
Corymbia tessellaris	1
Eucalyptus crebra	10
Corymbia intermedia	2
TOTAL	**33**

Part J: SAT Survey Results

SAT Survey ID	SAT @ Transect 9			
Tree Number	**Scientific Name**	**Common Name**	**DBH**	**Scat (Y/N)**
1	*Eucalyptus tereticornis*	Forest Red Gum	160	Nil
2	*Eucalyptus tereticornis*	Forest Red Gum	150	Nil
3	*Eucalyptus tereticornis*	Forest Red Gum	180	Nil
4	*Eucalyptus tereticornis*	Forest Red Gum	160	Nil
5	*Eucalyptus tereticornis*	Forest Red Gum	140	Nil
6	*Corymbia intermedia*	Pink Bloodwood	110	Nil
7	*Eucalyptus tereticornis*	Forest Red Gum	270	Nil
8	*Eucalyptus tereticornis*	Forest Red Gum	170	Nil
9	*Eucalyptus tereticornis*	Forest Red Gum	170	Nil
10	*Eucalyptus tereticornis*	Forest Red Gum	130	Nil
11	*Eucalyptus tereticornis*	Forest Red Gum	190	Nil
12	*Eucalyptus crebra*	Narrow Leaf Ironbark	140	Nil
13	*Eucalyptus crebra*	Narrow Leaf Ironbark	130	Nil
14	*Eucalyptus tereticornis*	Forest Red Gum	160	Nil
15	*Eucalyptus tereticornis*	Forest Red Gum	150	Nil
16	*Eucalyptus tereticornis*	Forest Red Gum	170	Nil
17	*Eucalyptus tereticornis*	Forest Red Gum	160	Nil
18	*Eucalyptus tereticornis*	Forest Red Gum	270	Nil
19	*Eucalyptus tereticornis*	Forest Red Gum	130	Nil
20	*Eucalyptus tereticornis*	Forest Red Gum	130	Nil

21	*Corymbia tessellaris*	Moreton Bay Ash	100	Nil
22	*Eucalyptus tereticornis*	Forest Red Gum	120	Nil
23	*Eucalyptus tereticornis*	Forest Red Gum	100	Nil
24	*Eucalyptus tereticornis*	Forest Red Gum	210	Nil
25	*Eucalyptus tereticornis*	Forest Red Gum	220	Nil
26	*Eucalyptus tereticornis*	Forest Red Gum	160	Nil
27	*Eucalyptus tereticornis*	Forest Red Gum	210	Nil
28	*Eucalyptus tereticornis*	Forest Red Gum	150	Nil
29	*Eucalyptus tereticornis*	Forest Red Gum	230	Nil
30	*Eucalyptus tereticornis*	Forest Red Gum	240	Nil
Total (Trees out of 30)				0
Total Percentage (%)				0
Total (Based on East Coast Medium)				None

Attach Landscape Photos Here

North



South



East



West



APPENDIX E: BASELINE CAMERA MONITORING – RAW DATA

10559 Motion Camera Survey Period Deployment 1 20th Aprill to 4th May 2023						
Camera ID	**Camera Name**	**Scientific Name**	**Common Name**	**Status**	**Number individuals**	**Date Recorded**
1	Camel	*Canis lupus familiaris*	Wild Dog	Feral animal	4	8th and 12th May 2023
1	Camel	*Bos taurus*	Domestic Cow	Non-native		-
1	Camel	*Macropus giganteus*	Eastern Grey Kangaroo	Native		-
2	Fly	*Phascogale tapoatafa*	Brush-tailed Phascogale	Native		-
2	Fly	*Bos taurus*	Domestic Cow	Non-native		-
2	Fly	*Macropus giganteus*	Eastern Grey Kangaroo	Native		-
2	Fly	*Trichosurus vulpecula*	Common Brushtail Possum	Native		-
2	Fly	*Macropus rufogriseus*	Red-necked Wallaby	Native		-
3	Possum	*Bos taurus*	Domestic Cow	Non-native		-
3	Possum	*Sus scrofa*	Wild Pig (multiple)	Feral animal	10	23rd March 2023
3	Possum	*Strepera graculina*	Pied Currawong	Native		-
3	Possum	*Centropus phasianinus*	Pheasant Coucal	Native		-
3	Possum	*Struthidea cinerea*	Apostlebird	Native		-
3	Possum	*Rhipidura leucophrys*	Willie Wagtail	Native		-
3	Possum	*Chenonetta jubata*	Australian Wood Duck	Native		-
3	Possum	*Vanellus miles*	Masked Lapwing	Native		-
3	Possum	*Gallinula tenebrosa*	Duskey Moorhen	Native		-
3	Possum	*Isoodon macrourus*	Northern Brown Bandicoot	Native		-
3	Possum	*Phaps chalcoptera*	Common Bronzewing	Native		-
3	Possum	*Macropus rufogriseus*	Red-necked Wallaby	Native		-
3	Possum	*Vulpes vulpes*	European Fox	Feral animal	2	28th March 2023
3	Possum	*Macropus giganteus*	Eastern Grey Kangaroo	Native		-
4	Eel	*Macropus giganteus*	Eastern Grey Kangaroo	Native		-
4	Eel	*Macropus rufogriseus*	Red-necked Wallaby	Native		-
5	Daisy	*Macropus rufogriseus*	Red-necked Wallaby	Native		-
5	Daisy	*Macropus giganteus*	Eastern Grey Kangaroo	Native		-
6	Wombat	Nil	Nil	-		-
10559 Motion Camera Survey Period Deployment 2 15th May to 11th August 2023						
Camera ID	**Camera Name**	**Scientific Name**	**Common Name**	**Status**	**Number individuals**	**Date Recorded**
2	Duck	*Macropus giganteus*	Eastern Grey Kangaroo	Native	-	-
2	Duck	*Macropus rufogriseus*	Red-necked Wallaby	Native	-	-
2	Duck	*Lepus europaeus*	European Hare	Non-native	-	-
2	Duck	*Ninox boobook*	Australian Boobook	Native	-	-
2	Duck	*Tachyglossus aculeatus*	Short-beaked Echidna	Native	-	-
3	Gecko	*Macropus giganteus*	Eastern Grey Kangaroo	Native	-	-
3	Gecko	*Macropus rufogriseus*	Red-necked Wallaby	Native	-	-
1	Prawn	*Macropus rufogriseus*	Red-necked Wallaby	Native	-	-
1	Prawn	*Macropus giganteus*	Eastern Grey Kangaroo	Native	-	-
1	Prawn	*Rattus fuscipes*	Bush Rat	Native	-	-
4	Squid	Nil	Nil	-	-	-
10559 Motion Camera Survey Deployment Period 3 11th August to 2nd November 2023						
Camera ID	**Camera Name**	**Scientific Name**	**Common Name**	**Status**	**Number individuals**	**Date Recorded**
1	Prawn	Nil	Nil	-		-
2	Gecko	*Bos taurus*	Domestic Cow	Non-native		-
2	Gecko	*Notamacropus parryi*	Whiptail Wallaby	Native		-
2	Gecko	*Macropus rufogriseus*	Red-necked Wallaby	Native		-
2	Gecko	*Macropus giganteus*	Eastern Grey Kangaroo	Native		-
2	Gecko	*Canis lupus familiaris*	Wild Dog	Feral animal	1	8th October 2023
2	Gecko	*Sus scrofa*	Wild Pig	Feral animal	2	15th August 2023 and 1st November 2023
3	Duck	*Canis lupus familiaris*	Wild Dog	Feral animal	6	16th, 17th, 19th, 23rd August 2023, 4th and 28th November 2023
3	Duck	*Macropus giganteus*	Eastern Grey Kangaroo	Native		-
3	Duck	*Macropus rufogriseus*	Red-necked Wallaby	Native		-
3	Duck	*Trichosurus vulpecula*	Common Brushtail Possum	Native		-
3	Duck	*Bos taurus*	Domestic Cow	Non-native		-
4	Squid	*Canis lupus familiaris*	Wild Dog	Feral animal	1	10th September 2023

KEY

Target pest species

APPENDIX F: REHABILITATION MANAGEMENT PLAN ROA 3

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan

DWG NO.	DRAWING TITLE	ISSUE	DATE
7399 E 01 Peninsula RMP A	COVER SHEET	A	29/10/2025
7399 E 02 Peninsula RMP A	INTRODUCTION AND NOTES	A	29/10/2025
7399 E 03 Peninsula RMP A	REHABILITATION ZONES	A	29/10/2025
7399 E 04 Peninsula RMP A	DETAIL SHEET	A	29/10/2025
7399 E 05-06 Peninsula RMP A	PLANTING SPECIES SCHEDULES	A	29/10/2025
7399 E 07 Peninsula RMP A	SITE PREPARATION	A	29/10/2025
7399 E 08 Peninsula RMP A	PLANTING NOTES	A	29/10/2025
7399 E 09 Peninsula RMP A	MAINTENANCE AND MONITORING	A	29/10/2025
7399 E 10 Peninsula RMP A	MONITORING AND ADAPTIVE MANAGEMENT	A	29/10/2025
7399 E A01 Peninsula RMP A	APPENDIX 1. WEED TREATMENT AND REMOVAL	A	29/10/2025
7399 E A02 Peninsula RMP A	APPENDIX 2. TABLE OF PERFORMANCE INDICATORS	A	29/10/2025
7399 E A03 Peninsula RMP A	APPENDIX 3. PHOTO MONITORING LOCATIONS	A	29/10/2025
7399 E A04 Peninsula RMP A	APPENDIX 4. PHOTO MONITORING REPORT	A	29/10/2025



Saunders Havill

PATHWAYS TO SUCCESS

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - *Introduction and Notes*

Introduction

This Peninsula Precinct (EPBC 2020/8629) Rehabilitation Management Plan (RMP) has been prepared by Saunders Havill (SH) for Montauban Environmental Offsets (MEO) and forms part of the Rosevale Offset Management Plan (OMP) for the Peninsula Precinct offset. The offset area is located at the Rosevale Offset Area 3 (ROA 3) within the Rosevale Offset Property.

The Rosevale Offset Area is located at Tarome Road, Tarome in South East Queensland and includes a combination of approved and proposed offset areas for Matters of National Environmental Significance.

The primary objective of this RMP is to provide a detailed guide for the creation of resilient, fully-functioning vegetation communities that achieve the Environmental Outcomes proposed under the OMP. Vegetation communities are to be rehabilitated in accordance with the composition and structure of the delineated Regional Ecosystems within each Environmental Management Zone to support the Koala, Grey-headed Flying-fox, Regent Honeyeater and Swift Parrot.

An intensive monitoring and maintenance regime is proposed to support a high survival rate of the plantings and high level of confidence in the proposed outcome.

This document should be read in conjunction with the Rosevale Offset Management Plan for ROA 3 (Peninsula Precinct (EPBC 2020/8629)).

BACKGROUND

The Rosevale offset property is located on Tarome Road, Tarome. The Rosevale offset property is approximately 9.5 km north-west of Aratula and located in the Scenic Rim Regional Council Local Government. The offset site associated with this property, Rosevale Offset Area 3 (ROA 3), is located approximately 51 km southwest of the Peninsula Precinct Project area, where MNES habitat impacts are proposed.

Rosevale Offset Property is contained on the following allotments:

- Part of Lot 1/CC3571
- Lot 103/CH311061
- Lot 115/SP167206
- Lot 116/SP167206
- Lot 211/CH311636
- Lot 229/CH312601
- Lot 24/CH312265
- Lot 230/CH312495
- Lot 4/RP31137
- Lot 71/CH311061
- Lot 72/CH311061
- Lot 77/CH311086
- Lot 9/CH311910
- Lot 86/RP234513
- Lot 68/CH311061

For this offset strategy, the proposed offset area (ROA 3) is contained on the following allotments of the offset property:

- Part of Lot 1/CC3571

The offset area adjoins the Bremer River to the east and contains multiple constructed farm dams which will be retained and utilised as part of the management of the offset.

Vegetation

The ROA 3 offset area is mapped as containing predominantly RE 12.3.3 with a small area of composite RE 12.8.17/12.8.14 with vegetation structure varying from open paddock to sparse regrowth.

RE12.3.3 is described by the Queensland Herbarium as: *Eucalyptus tereticornis* woodland. *Eucalyptus crebra* and *E. moluccana* are sometimes present and may be relatively abundant in places, especially on edges of plains and higher level alluvium. Other species that may be present as scattered individuals or clumps include *Angophora subvelutina* or *A. floribunda, Corymbia clarksoniana, C. intermedia, C. tessellaris, Lophostemon suaveolens* and *E. melanophloia*. Occurs on Quaternary alluvial plains, terraces and fans where rainfall is usually less than 1000mm/y. Not a Wetland. (BVG1M: 16c).

RE 12.8.17 is described as: Mixed woodland with combinations of *Eucalyptus crebra, E. melanophloia, E. tereticornis, Corymbia tessellaris, C. intermedia*, and commonly containing *Angophora subvelutina* and *E. melliodora*, with a grassy ground layer. Usually occurs on mid and lower slopes of hills on Cainozoic igneous rocks, especially basalt. Not a Wetland. (BVG1M: 11a).

RE 12.8.14 is described as: *Eucalyptus eugenioides, E. biturbinata, E. melliodora +/- E. tereticornis, Corymbia intermedia, E. crebra* open forest. *Allocasuarina torulosa* is a common understorey species. Localised occurrences of *Eucalyptus laevopinea, E. quadrangulata* and *E. banksii* may occur. Occurs on Cainozoic igneous rocks, especially basalt. Not a Wetland. (BVG1M: 11a).

RE 12.3.3 was ground-truthed as the dominant regional ecosystem within the offset area, forming EMZ 1, with an area dominated by RE12.8.17 in the southern portion of the offset area forming the smaller EMZ 2. Planting species containing RE 12.8.14 are also proposed as part of the overall planting outcome within EMZ 2 with the dominant regional ecosystem to reflect RE 12.8.17.

The majority of the offset area has been cleared for grazing with areas of sparse regrowth located in the southern portion of the offset area within EMZ 2.

Soils

The Atlas of Australia soils map the site as predominantly comprising Vertosols with areas mapped as containing Rudosols. The broader landscape is predominantly mapped as containing Rudosols.

Vertosols are defined by the Australian Soils Classification (ASC) as a soil type with very high-soil fertility and large water holding capacity. Vertosols are typically brown, grey or black soils which crack open when dry.

Rudosols generally have a low fertility and low water-holding capacity. These are often shallow, stony soils with little more than some minor organic matter accumulation on the surface and weathered parent material.

The presence of Vertosols is anticipated to support the broadscale planting requirements.

The Geological Survey of Queensland's 1:100,000 series Helidon sheet indicates that the site is located in an area which is underlain predominantly by shale, siltstone, sandstone and coal seams of the middle Jurassic – Late Jurassic.

REHABILITATION – APPROACHES

Rehabilitation or "Ecological Restoration" can be described as "the process of assisting the recovery of an ecosystem that has been degraded, damaged or destroyed" (source: Society for Ecological Restoration International). The following four ecological restoration approaches are listed under the SEQERF guidelines and are described in further detail on Sheet 03.

Ecological Restoration Approaches	
Natural Regeneration	
Applies:	To relatively large, intact and weed-free areas of native vegetation. Where native plants are healthy and capable of regenerating without human intervention. When native plant seed is stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water.
	Where the plant community has a high potential for recovery after any short-live disturbance such as a fire or cyclonic winds. When preventative action is all that is required to avert on-going disturbances e.g. erection of fencing to prevent intrusion by cattle.
Role of planting:	Planting in such areas can work against the aims of restoration by interfering with natural regeneration.
Goal vegetation community:	The re-establishing plant community will be similar in structure, composition and diversity to the original vegetation.
Assisted Natural Regeneration	
Applies:	To natural areas where the native plant community is largely healthy and functioning. When native plant seed is still stored in the soil or will be able to reach the site from nearby natural areas, by birds or other animals, wind or water. Where the natural regeneration processes (seedling germination, root suckering, etc.) are being inhibited by external factors, such as weed invasion, soil compaction, cattle grazing, mechanical slashing, etc. When limited human intervention, such as weed control, minor amelioration of soil conditions, erection of fencing, cessation of slashing, etc. will be enough to trigger the recovery processes through natural regeneration. When the main management issue is weed infestation and/or current land use practices.
Role of planting:	Planting in such areas can work against the aims of restoration by interfering with natural regeneration except where species cannot return to site without direct intervention.
Goal vegetation community:	The re-establishing plant community will be substantially similar in structure, composition and diversity to the original vegetation.
Reconstruction	
Applies:	Where the site is highly degraded or altered. When the degree of disturbance has been so great and long-standing that the pre-existing native plant community cannot recover by natural means. To sites such as areas of fill, sites affected by stormwater flow, areas that have been drastically cleared, even though there may be a few remaining native trees or shrubs. When a greater degree of human intervention is required, such as weed control, cessation of grazing and/or slashing, amelioration of soil conditions such as importation of soils, drainage works or re-shaping of the landscape.
Role of planting:	Importation of native species to the area is required, either through planting or direct seeding (in some situations). natural regeneration and recruitment is insufficient to initially re-establish the original vegetation. Depending on the prevailing circumstances, the planting of a broad diversity of species from the target ecosystem may be unnecessary and the use of pioneers may be sufficient to re-establish ecological processes.
Goal vegetation community:	The re-establishing planted community should be similar to the original vegetation in structure, composition and diversity.
Fabrication (Type Conversion)	
Applies:	Where site conditions have been irreversibly changed. When it is not possible to restore the original native plant community. Where a better-adapted local plant community can be planted that will function within the changed conditions. In situations such as the construction of a wetland plant community to mitigate increased urban storm-water run-off.
Role of planting:	Revegetation (planting) is the major component in a fabrication program.
Goal vegetation community:	The re-establishing planted community should be similar to a naturally occurring plant community of the same type (e.g. a constructed freshwater wetland should resemble a natural system in terms of structure, composition and diversity).

Adapted from Gold Coast Council's 'Guideline for the preparation of a Rehabilitation Plan'

REHABILITATION - METHODOLOGY

Detailed assessment of site conditions prior to commencement of documentation is essential. As part of most rehabilitation scopes, it is worth considering an appropriate methodology for both compiling documentation and site works. This can be broken down into the following items:

- Site assessment
- Rehabilitation Design Documentation (this plan)
- Site Works
- Maintenance and monitoring

METHODOLOGY – SITE ASSESSMENT

Detailed assessment of site conditions prior to commencement of documentation is essential in the establishment of a site-specific ecological restoration methodology. In accordance with the SEQERF. The following checklist has formed part of the site assessment process and is detailed in the OMP:

- Describe the history and background of the site
- Describe the soil, drainage, topography and aspect
- Describe the native vegetation on the site and along site boundaries
- Describe the weeds on site
- Describe the vegetation dispersal and structure
- Describe the fauna use onsite
- Describe estimated native regeneration response.

The responses to the above checklist provides the basis of the proposed restoration approach primarily using reconstruction with elements of assisted natural regeneration for each management zone within this RMP.

Consideration should be made in the importance of integrating site-specific measures for fauna habitat and movement. With many fauna species having specific habitat requirements, foraging patterns and movement patterns. During the site assessment process, the following provisions should be taken into consideration:

- Fauna movement opportunities via easements, tracts, utility corridors and or infrastructure pathways;
- Diversity and type of fauna and distribution on site;
- Habitat opportunities e.g. Dense foliage, roosting areas, log hollows and potential nesting boxes;
- Fauna disturbance and vicinity of works to significant nesting areas and or fauna movement;
- Distribution of significant specialized food resources e.g. Koala trees; and
- Stage weed removal and or altering of weed control technique if the weeds are currently forming a significant fauna habitat.

For the sake of keeping this plan concise, site analysis results are compiled under a separate template, and may or may not be included in this set, however the analysis outcomes derive the Rehabilitation design methodology.

METHODOLOGY – REHABILITATION DESIGN

This documentation has been compiled through processes outlined in the SEQERF, site analysis and previous rehabilitation project experiences. The rehabilitation design—comprising distinct management zones—provides assessment managers, clients and contractors a clear methodology to assist the recovery of an ecosystem(s) that has been degraded, damaged or destroyed. Rehabilitation zones were identified through detailed site analysis and are described on *Sheet 03.*

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References:
South East Queensland Ecological Restoration Framework (2012)

AMENDMENTS				
ISSUE	DATE	DESCRIPTION	DRAWN	CHECKED
A	29/10/2025	CLIENT DRAFT	TF	AW

CLIENT: Montauban Environmental Offsets

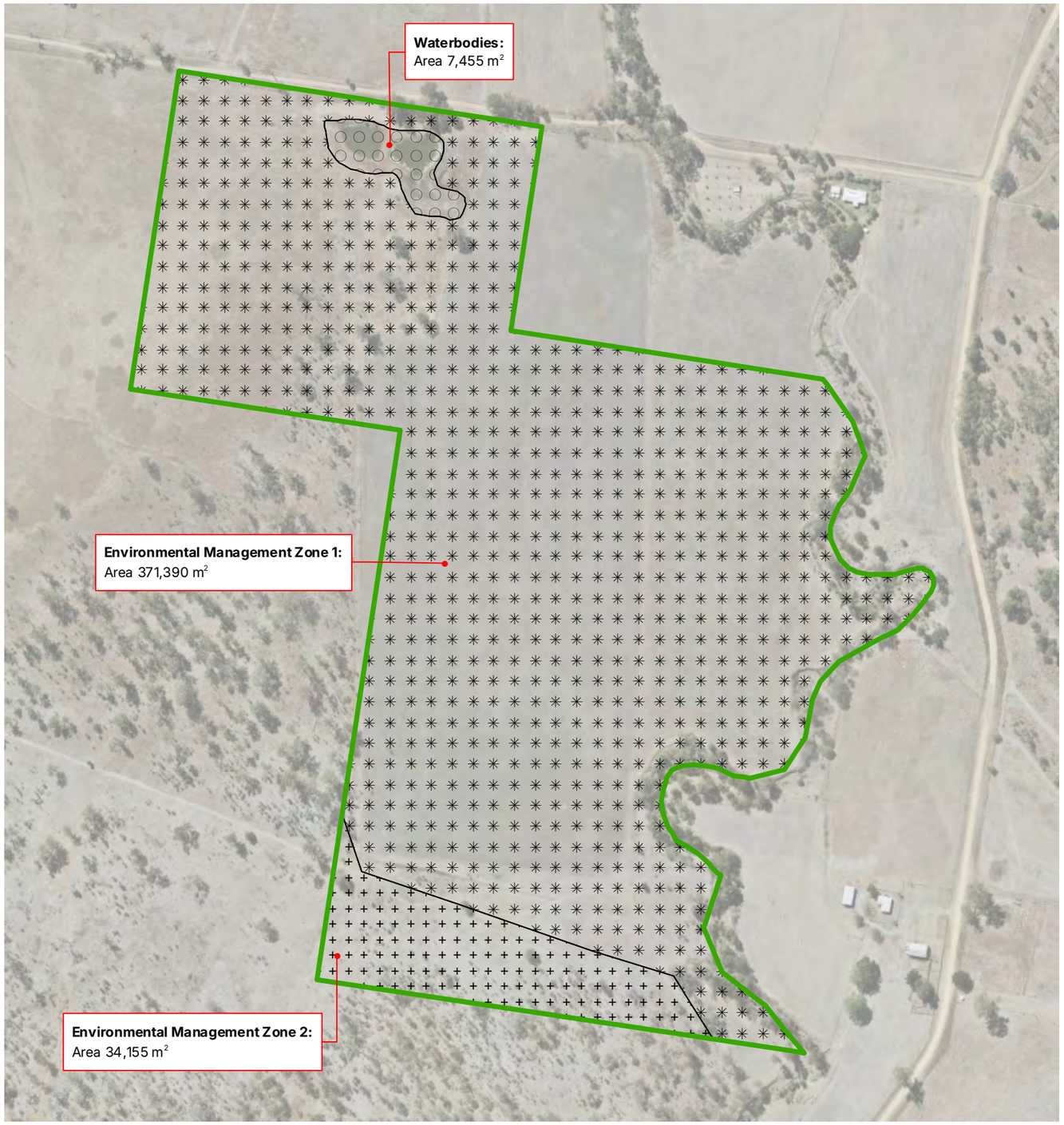
PROJECT: Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

DRAWING TITLE: REHABILITATION MANAGEMENT PLAN

DRAWING NO.: **7399 E 02 Peninsula RMP A**

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - *Rehabilitation Zones*



MANAGEMENT ZONES LEGEND

Environmental Management Zone 1 – Non-remnant Paddock RE 12.3.3 (Reconstruction)

Existing native trees, shrubs and groundcovers to be protected and retained.

Appropriate (sensitive) weed management methodology within this zone to encourage natural regeneration, minimise damage to existing native vegetation, stabilise soil and minimise impacts to aquatic / semi-aquatic fauna.

Entire zone to be planted with a mixture of trees, shrubs and groundcovers, following weed management works at densities appropriate for providing foraging habitat for koala, grey-headed flying-fox, regent honeyeater and swift parrot. Any planting on creek bank to comply with 'Categories of channel vegetation' figure on Sheet 08. Species to be of local provenance and consistent with native species occurring naturally on site and/or regional ecosystem 12.3.3.

Refer to Rehabilitation Notes for additional details, plant species and densities.

Environmental Management Zone 2 – Sparse Regrowth RE 12.8.17/12.8.14 (Reconstruction)

Existing native trees, shrubs and groundcovers to be protected and retained.

Appropriate (sensitive) weed management methodology within this zone to encourage natural regeneration, minimise damage to existing native vegetation, stabilise soil and minimise impacts to aquatic / semi-aquatic fauna.

Ongoing weed management throughout the maintenance period to reinforce primary weed removal. Any planting on creek bank to comply with 'Categories of channel vegetation' figure on Sheet 08.

Infill planting of bare areas beneath existing native canopy trees with a mixture of shrubs and groundcovers throughout, and trees installed at locations >3m from existing tree trunks. Infill planting is to occur utilising seedling trees, shrubs and groundcovers where required to supplement density of foraging tree species for koala, grey-headed flying-fox, regent honeyeater and swift parrot. Species to be of local provenance and consistent with native species occurring naturally on site and/or regional ecosystems 12.8.17 and 12.8.14.

Refer to Rehabilitation Notes for additional details, plant species and densities.

Waterbodies

No rehabilitation measures are proposed within this zone.

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N

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0 25 50 100 150 200 m

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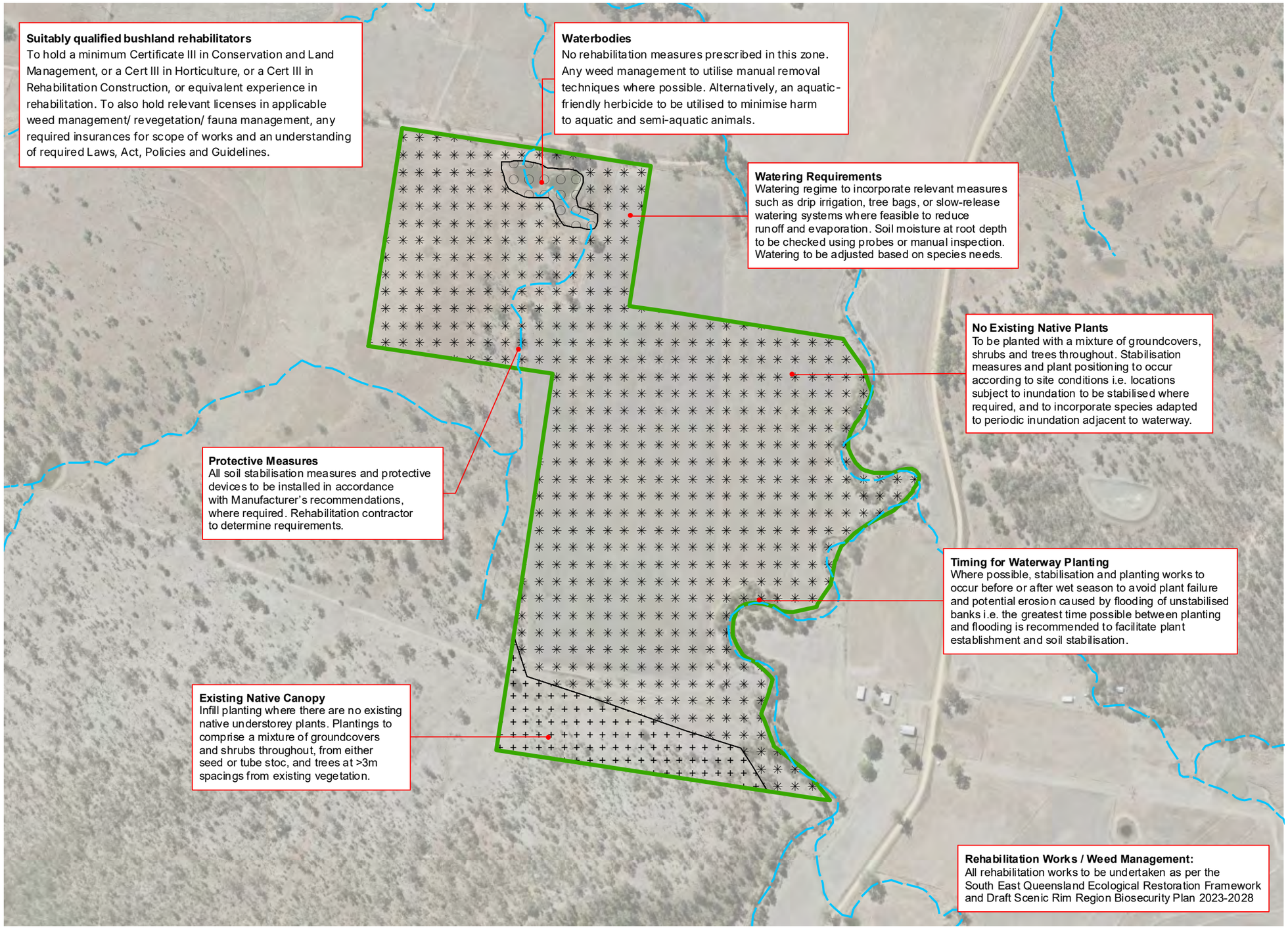
PROJECT
Rosevale Offset Area 3 –
Peninsula Precinct (EPBC 2020/8629)

DRAWING TITLE
REHABILITATION
MANAGEMENT PLAN

DRAWING NO.
7399 E 03 Peninsula RMP A

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - *Detail Sheet*



LEGEND

- Mapped Waterways
- Environmental Management Zone [413,000 m²]

Management Zones

- **Environmental Management Zone 1:** Non-remnant Vegetation (RE 12.3.3) [371,390 m ²]
- **Environmental Management Zone 2:** Regrowth Vegetation (RE 12.8.17/12.8.14) [34,155 m ²]
- Waterbodies

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0 25 50 100 150 200 m

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A	22/10/2025	CLIENT DRAFT	TF	AW

CLIENT
Montauban Environmental Offsets

PROJECT
Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

DRAWING TITLE
REHABILITATION MANAGEMENT PLAN

DRAWING NO.
7399 E 04 Peninsula RMP A

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - *Planting Species Schedule (i)*

FINAL SPECIES PALETTE TO COMPRISE MAXIMUM DIVERSITY OF SPECIES FROM SCHEDULES. TO BE APPROVED BY ENVIRONMENTAL COORDINATOR.

NOTES

- Final species palette to comprise maximum diversity of species from schedules. To be approved by environmental coordinator and Scenic Rim Regional Council prior to installation.
- Area calculations are a maximum calculation for use as needed.
- Final on-ground planting numbers and densities subject to planting contractor requirements.

Environmental Management Zone 1 – Non-remnant Paddock RE 12.3.3 (Reconstruction)

Notes:

1) Trees 1 to be planted at a density of 1 tree per 10 m².
2) Setback trees 3 metres minimum from all property boundaries and services
3) Distribute plants in groups on site in random arrangement - to be confirmed with super-intendent on site
4) Plant species according to tolerances and site conditions
5) Plant quantities to be confirmed by rehabilitation supervisor according to site conditions. Unsuitable or unavailable species to be substituted with other species from this schedule.
6) Species consistent with RE 12.3.3 technical description.

SCIENTIFIC NAME	COMMON NAME	HABITAT VALUE	PLANT FORM	POT SIZE	PLANTING DENSITY	PERCENTAGE	QUANTITY
T1 / TREES							
*Eucalyptus tereticornis subsp. tereticornis**	Forest Red Gum	**SP preferred** Koala GHFF	Tree to 50 m	Tube	1 per 10 m²	40%	14840
Eucalyptus crebra	Narrow-leaved Ironbark	Koala GHFF	Tree to 35 m	Tube	1 per 10 m²	15%	5565
Corymbia clarksoniana	Clarkson's Bloodwood	Koala GHFF	Tree to 15 m	Tube	1 per 10 m²	10%	3710
Angophora leiocarpa	Smooth-barked Apple	Koala GHFF	Tree to 25 m	Tube	1 per 10 m²	7%	2597
Angophora subvelutina	Broad-leaved Apple	Koala GHFF	Tree to 20 m	Tube	1 per 10 m²	7%	2597
Corymbia intermedia	Pink Bloodwood	Koala GHFF	Tree to 35 m	Tube	1 per 10 m²	7%	2597
Corymbia tessellaris	Moreton Bay Ash	Koala GHFF	Tree to 35 m	Tube	1 per 10 m²	5%	1855
Lophostemon suaveolens	Swamp Box	Koala GHFF	Tree to 25 m	Tube	1 per 10 m²	5%	1855
Alphitonia excelsa	Soap Tree	N/A Pioneer	Tree to 15 m	Tube	1 per 10 m²	4%	1484
						TOTAL	**37,100**
T2 / SHRUBS							
Jacksonia scoparia	Dogwood	N/A Pioneer	Shrub	Tube	1 per 10 m²	15%	5565
Acacia disparrima	Hickory Wattle	N/A Pioneer	Shrub or small tree	Tube	1 per 10 m²	15%	5565
Allocasuarina leuhmannii	Bull-oak	N/A Pioneer	Shrub or small tree	Tube	1 per 10 m²	28%	10388
Acacia concurrens	Black Wattle	N/A Pioneer	Shrub or small tree	Tube	1 per 10 m²	7%	2597
Acacia maidenii	Maiden's Wattle	N/A Pioneer	Shrub or small tree	Tube	1 per 10 m²	14%	5194
Acacia glaucocarpa	Feathery Wattle	N/A Pioneer	Shrub or small tree	Tube	1 per 10 m²	7%	2597
Acacia salicina	Sally Wattle	N/A Pioneer	Shrub or small tree	Tube	1 per 10 m²	7%	2597
Banksia integrifolia	Coastal Banksia	N/A Pioneer	Shrub or small tree	Tube	1 per 10 m²	7%	2597
						TOTAL	**37,100**
GROUNDCOVERS							
Imperata cylindrica	Blady Grass	N/A Other	Grass	Tube or seed	1 per 5 m²	5%	3710
Themeda triandra	Kangaroo Grass	N/A Other	Grass	Tube or seed	1 per 5 m²	5%	3710
Eremochloa bimaculata	Poverty Grass	N/A Other	Grass	Tube or seed	1 per 5 m²	4.5%	3339
Cymbopogon refractus	Barbed Wire Grass	N/A Other	Grass	Tube or seed	1 per 5 m²	4.5%	3339
Heteropogon contortus	Black Speargrass	N/A Other	Grass	Tube or seed	1 per 5 m²	4.5%	3339
Poa sieberiana var. sieberiana	Blue Tussock Grass	N/A Other	Grass	Tube or seed	1 per 5 m²	4.5%	3339
Dichanthium sericeum	Queensland bluegrass	N/A Other	Grass	Tube or seed	1 per 5 m²	4.5%	3339
Eragrostis brownii	Browns Lovegrass	N/A Other	Grass	Tube or seed	1 per 5 m²	4.5%	3339
Sarga leiocladum	Wild Sorghum	N/A Other	Grass	Tube or seed	1 per 5 m²	4.5%	3339
Panicum effusum	Hairy Panic	N/A Other	Grass	Tube or seed	1 per 5 m²	4.5%	3339
Aristida vagans	Threeawn Speargrass	N/A Other	Grass	Tube or seed	1 per 5 m²	4.5%	3339
Oplismenus aemulus	Australian Basket Grass	N/A Other	Grass	Tube or seed	1 per 5 m²	4.5%	3339
Gahnia aspera	Saw Sedge	N/A Other	Sedge	Tube or seed	1 per 5 m²	4.5%	3339
Lepidosperma laterale	Variable Swordsedge	N/A Other	Sedge	Tube or seed	1 per 5 m²	4.5%	3339
Lomandra longifolia	Spiny-headed Mat-rush	N/A Other	Sedge	Tube or seed	1 per 5 m²	4.5%	3339
Dianella caerulea	Blue Flax-lily	N/A Other	Herb	Tube or seed	1 per 5 m²	4.5%	3339
Eremophila debilis	Winter Apple	N/A Other	Prostrate shrub	Tube or seed	1 per 5 m²	4.5%	3339
Hardenbergia violacea	False Sarsparilla	N/A Other	Prostrate shrub	Tube or seed	1 per 5 m²	4.5%	3339
Eustrephus latifolius	Wombat Berry	N/A Other	Vine	Tube or seed	1 per 5 m²	4.5%	3339
Chrysocephalum apiculatum	Yellow Buttons	N/A Other	Herb	Tube or seed	1 per 5 m²	4.5%	3339
Glycine clandestina	Twining Glycine	N/A Other	Scrambling vine	Tube or seed	1 per 5 m²	4.5%	3339
Murdannia graminea	Grass Lily	N/A Other	Herb	Tube or seed	1 per 5 m²	4.5%	3339
						TOTAL	**74,200**

*Planting percentages required at prescribed rate to fulfil offset planting requirements for Swift Parrot.

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References:
South East Queensland Ecological Restoration Framework (2012)

AMENDMENTS

ISSUE	DATE	DESCRIPTION	DRAWN	CHECKED
A	29/10/2025	CLIENT DRAFT	TF	AW

CLIENT
Montauban Environmental Offsets

PROJECT
Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

DRAWING TITLE
REHABILITATION MANAGEMENT PLAN

DRAWING NO.
7399 E 05 Peninsula RMP A

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - *Planting Species Schedule (ii)*

FINAL SPECIES PALETTE TO COMPRISE MAXIMUM DIVERSITY OF SPECIES FROM SCHEDULES. TO BE APPROVED BY ENVIRONMENTAL COORDINATOR.

NOTES

- Final species palette to comprise maximum diversity of species from schedules. To be approved by environmental coordinator and Scenic Rim Regional Council prior to installation.
- Area calculations are a maximum calculation for use as needed.
- Final on-ground planting numbers and densities subject to planting contractor requirements.

Environmental Management Zone 2 – Sparse Regrowth RE 12.8.17/12.8.14 (Reconstruction)

Notes:

1) Trees to be planted at a density of 1 tree per 50 m^2.
2) Setback trees 3 metres minimum from all property boundaries and services
3) Distribute plants in groups on site in random arrangement - to be confirmed with super-intendent on site
4) Plant species according to tolerances and site conditions
5) Plant quantities to be confirmed by rehabilitation supervisor according to site conditions. Unsuitable or unavailable species to be substituted with other species from this schedule.
6) Species consistent with RE 12.8.17/12.8.14 technical description.

SCIENTIFIC NAME	COMMON NAME	HABITAT VALUE	PLANT FORM	POT SIZE	PLANTING DENSITY	PERCENTAGE	QUANTITY
T1/ TREES							
*Eucalyptus melliodora**	Yellow Box	**RHE preferred SP preferred** Koala GHFF	Tree to 30 m	Tube	1 per 50 m^2	40%	272
*Eucalyptus eugenioides**	Thin-leaved Stringybark	**RHE preferred** Koala GHFF	Tree to 25 m	Tube	1 per 50 m^2	12%	82
Eucalyptus crebra	Narrow-leaved Ironbark	Koala GHFF	Tree to 35 m	Tube	1 per 50 m^2	10%	68
Eucalyptus tereticornis subsp. *Tereticornis**	Forest Red Gum	**SP preferred** Koala GHFF	Tree to 50 m	Tube	1 per 50 m^2	10%	68
Eucalyptus melanophloia	Silver-leaved Ironbark	Koala GHFF	Tree to 20 m	Tube	1 per 50 m^2	5%	34
Corymbia intermedia	Pink Bloodwood	Koala GHFF	Tree to 35 m	Tube	1 per 50 m^2	8%	54
Corymbia tessellaris	Moreton Bay Ash	Koala GHFF	Tree to 35 m	Tube	1 per 50 m^2	6%	40
Angophora subvelutina	Broad-leaved Apple	Koala GHFF	Tree to 20 m	Tube	1 per 50 m^2	5%	34
Allocasuarina torulosa	Forest She-oak	N/A Pioneer	Tree to 8 m	Tube	1 per 50 m^2	2%	14
Brachychiton populneus	Kurrajong	N/A Pioneer	Tree to 20 m	Tube	1 per 50 m^2	2%	14
						TOTAL	**680**
T2 / SHRUBS							
Jacksonia scoparia	Dogwood	N/A Pioneer	Shrub	Tube	1 per 50 m^2	12.5%	85
Acacia fimbriata	Brisbane Wattle	N/A Pioneer	Shrub	Tube	1 per 50 m^2	12.5%	85
Cassinia quinquefaria	Wild Rosemary	N/A Pioneer	Shrub	Tube	1 per 50 m^2	12.5%	85
Exocarpos Cupressiformis	Native Cherry	N/A Pioneer	Shrub	Tube	1 per 50 m^2	12.5%	85
Dodonaea viscosa	Hop Bush	N/A Pioneer	Shrub	Tube	1 per 50 m^2	12.5%	85
Olearia elliptica	Sticky Daisy Bush	N/A Pioneer	Shrub	Tube	1 per 50 m^2	12.5%	85
Breynia oblongifolia	Coffee Bush	N/A Pioneer	Shrub	Tube	1 per 50 m^2	12.5%	85
Solanum stelligerum	Devil's Needles	N/A Pioneer	Shrub	Tube	1 per 50 m^2	12.5%	85
						TOTAL	**680**

GROUNDCOVERS							
Themeda triandra	Kangaroo Grass	N/A Other	Grass	Tube or seed	1 per 10 m^2	5%	170
Cymbopogon refractus	Barbed Wire Grass	N/A Other	Grass	Tube or seed	1 per 10 m^2	5%	170
Heteropogon contortus	Black Speargrass	N/A Other	Grass	Tube or seed	1 per 10 m^2	5%	170
Poa sieberiana var. sieberiana	Blue Tussock Grass	N/A Other	Grass	Tube or seed	1 per 10 m^2	5%	170
Dichanthium sericeum	Queensland bluegrass	N/A Other	Grass	Tube or seed	1 per 10 m^2	5%	170
Eragrostis brownii	Browns Lovegrass	N/A Other	Grass	Tube or seed	1 per 10 m^2	5%	170
Sarga leiocladum	Wild Sorghum	N/A Other	Grass	Tube or seed	1 per 10 m^2	5%	170
Panicum effusum	Hairy Panic	N/A Other	Grass	Tube or seed	1 per 10 m^2	5%	170
Aristida vagans	Threeawn Speargrass	N/A Other	Grass	Tube or seed	1 per 10 m^2	5%	170
Oplismenus aemulus	Australian Basket Grass	N/A Other	Grass	Tube or seed	1 per 10 m^2	5%	170
Gahnia aspera	Saw Sedge	N/A Other	Sedge	Tube or seed	1 per 10 m^2	5%	170
Lepidosperma laterale	Variable Swordsedge	N/A Other	Sedge	Tube or seed	1 per 10 m^2	5%	170
Lomandra longifolia	Spiny-headed Mat-rush	N/A Other	Sedge	Tube or seed	1 per 10 m^2	5%	170
Dianella caerulea	Blue Flax-lily	N/A Other	Herb	Tube or seed	1 per 10 m^2	5%	170
Eremophila debilis	Winter Apple	N/A Other	Prostrate shrub	Tube or seed	1 per 10 m^2	5%	170
Hardenbergia violacea	False Sarsparilla	N/A Other	Prostrate shrub	Tube or seed	1 per 10 m^2	5%	170
Eustrephus latifolius	Wombat Berry	N/A Other	Vine	Tube or seed	1 per 10 m^2	5%	170
Chrysocephalum apiculatum	Yellow Buttons	N/A Other	Herb	Tube or seed	1 per 10 m^2	5%	170
Glycine clandestina	Twining Glycine	N/A Other	Scrambling vine	Tube or seed	1 per 10 m^2	5%	170
Asperula *conferta*	Common Woodruff	N/A Other	Herb	Tube or seed	1 per 10 m^2	5%	170
						TOTAL	**3,400**

*Planting percentages required at prescribed rate to fulfil offset planting requirements for Regent Honeyeater and Swift Parrot.

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References:
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CLIENT: Montauban Environmental Offsets

PROJECT: Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

DRAWING TITLE: REHABILITATION MANAGEMENT PLAN

DRAWING NO.: **7399 E 06 Peninsula RMP A**

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - *Site Preparation*

REHABILITATION TIMELINE

Specific timeframes for rehabilitation are described within the following sections of this RMP. The following timeframes for each phase of rehabilitation is recommended. It is noted timeframes may be subject to change depending on climate and site conditions. Where timeframes are required to change, the proposed schedule will be updated accordingly. Timing is taken from the legal securement of the offset area.

- Source and propagate seed – Years 1-2
- Site preparation (initial weed treatment, soil cultivation, controlled burns) – Years 1-2
- Broadscale planting works – Years 2-3
- Maintenance (watering, follow-up weed works) – Years 2-5 with potential to extend to Year 7 (minimum of 2-5 years for establishment)

It is noted some monitoring components are required to occur prior to the commencement of any site work and will be coordinated with the Offset Provider. Refer to Monitoring and Reporting Framework for full details of monitoring proposed.

METHODOLOGY – SITE PREPARATION

Prior to site works commencing, the site should be secured from degrading impacts such as grazing by stock, unauthorised access and rubbish. Some factors that may require immediate attention include:

- The presence of highly invasive weed species which may disperse further prior to substantial site works commencing
- The presence of weed species which may have a long-term impact on ecological communities such as exotic and weed varieties of vines
- Flammable materials (including weed thickets, grasses and vines)
- Damaging and easy access by 4WD, motorbikes and pedestrians into core retained vegetation and ecological restoration areas. This may require installation of temporary fencing if deemed appropriate Site works can be typically broken down into the following categories:
    - Primary Works
    - Follow-up Works
    - Maintenance Works (refer Methodology – Maintenance)

Primary Works

Primary works or initial works within the site or a section of the site will commonly involve a sequence of activities such as the control of all groundcover weeds, woody weeds in the understorey and exotic vines prior to the control of weed trees. Primary work has the effect of creating a large degree of disturbance which will stimulate the germination of native and exotic species. Therefore, continuing works should be scheduled shortly after the initial visit to allow for timely control of the newly regenerating weeds.

Highly invasive weeds, such as the Restricted Invasive Plants listed under the Biosecurity Act 2014, should be treated as a priority during primary works to alleviate competition on native flora species and inhibit spread into newly disturbed areas. For example, canopy smothering vines such as Cat's Claw Creeper can have a detrimental impact on native canopy trees and should be prioritised over less invasive herbs such as Blue Billy Goat Weed. Some weeds will also need to be treated in stages i.e. where the weed provides protection and habitat for native fauna or where it is providing bank stabilisation. For example, where Lantana is providing the only habitat for small birds, it should be removed in phases as native shrub habitat establishes.

Techniques used during primary work commonly involve spot spray, cut-scrape paint, cut-paint, scrape-paint, roll-hang and over spraying (source: SEQERF). *Refer to Weed Management notes for additional details.* Following completion of weed management, rehabilitation (such as assisted natural regeneration, construction and fabrication planting) can occur in areas unaffected by weed management activities or areas that primary weed management activities have concluded. Refer to Rehabilitation Works notes for additional details. At the end of primary work, the zone will have been comprehensively and systematically worked, ready for follow-up works.

Follow-up Works

At intervals, which will vary according to the type of weed impacting the site and growing conditions, follow-up work will be necessary. This generally involves the spot-spraying of newly germinating weeds and resprouting sections of woody weeds and vines. It is at this stage that observational visits should be made to the site to determine what progress the vegetation is making and decide when to implement further follow-up work. A site that receives badly timed, too frequent or too little follow-up will rapidly experience setbacks, as weed propagules will quickly become established in the newly disturbed areas. Germinating native seedlings may be swamped by weeds or damaged by inexperienced operators thereby exhausting the seed bank. Unless adequate follow-up can be ensured when planning restoration works, there is little point in commencing primary work, as time and resources are consumed with no substantial gain achieved (source: SEQERF).

METHODOLOGY – WEED NOTES

Weed management typically comprises a major part of rehabilitation site works. Weed management provides the basis of aiding natural regeneration and assisted natural regeneration. It also forms part of the preliminary work required for reconstruction and fabrication scopes.

Weed Management is to be undertaken in accordance with the SEQERF Primary, Follow-up and Maintenance works notes above. Weed management shall encompass all species declared at the commonwealth, state and local level, and any weeds that appear to be invasive at the site.

A total of 25 species of weed recorded within the offset area and surrounding areas within the broader offset property. Two (2) species of WONS were recorded within the offset area being Lantana camara (Lantana) and Senecio madagascariensis (Fireweed). Seven (7) species of Category 3 restricted weeds listed under the Queensland Biosecurity Act 2014 were recorded.

Critical skills for Weed Management include:

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

Knowledge of Relevant Legislation

It is expected contractors have a depth of knowledge of relevant legislation to complete site rehabilitation works. This includes invasive plant classifications and control obligations under the Queensland *Biosecurity Act 2014* and local Biosecurity Plans (Refer to adjacent schedules for classification of weeds under the Act).

Bush regenerators must also comply with the requirements of the Workplace Health and Safety Act 2011 or, when working on Commonwealth lands, the Commonwealth's Occupational Health and Safety (Commonwealth Employment) Act 1991.

Contractors should also obtain all relevant permits required under State and Commonwealth legislation (e.g. Nature Conservation Act 1992, Fisheries Act 1994, Vegetation Management Act 1999, Biosecurity Act 2014). Contractors must also be aware of and adhere to cultural heritage protection obligations under the Aboriginal Cultural Heritage Act 2003 and where chemicals are in use, the Agricultural Chemicals Distribution Control Act 1966.

In addition to the above, contractors should also be familiar with local government body requirements (e.g. Local Codes, Policies and Guidelines).

RESTRICTED MATTERS (*BIOSECURITY ACT 2014*)	
Category	**Description**
1	must be reported to an inspector within 24 hours if it is present in, or on, something in your possession or under your control or at a place where you are the occupier, unless an appropriately authorised officer has already been advised or you possess a permit for the restricted matter. Includes red imported fire ants, electric ants, Asian honey bees, and certain animal diseases, aquatic diseases and pathogens.
2	must be reported to an inspector within 24 hours if it is present in, or on, something in your possession or under your control or at a place where you are the occupier, unless an appropriately authorised officer has already been advised or you possess a permit for the restricted matter. includes certain noxious fish, weeds and pest animals
3	You must not distribute this restricted matter. It must not be given as a gift, sold, traded or released into the environment unless the distribution or disposal is authorised in a regulation or under a permit. Deliberate human distribution or disposal contrary to the legislation is a key source of spread into other areas. includes weeds, pest animals and noxious fish
4	You must not move this restricted matter to ensure that it does not spread into other areas of the state. includes specific weeds, pest animals and noxious fish
5	You must not possess or keep this restricted matter under your control. These pests have a high risk of negatively impacting on the environment. You may only keep this restricted matter under a permit of the *Biosecurity Act 2014* or another Act. includes weeds, pest animals and noxious fish
6	You must not feed this category of restricted matter. Feeding this restricted matter may cause their numbers to increase and negatively impact the economy or the environment. Feeding for the purpose of preparing for or undertaking a control program is exempted. Includes invasive animals such as feral deer, foxes, rabbits and wild dogs and noxious fish such as carp, gambusia and tilapia.
7	If you have these noxious fish in your possession, you must kill the restricted matter and dispose of the carcass by burying the whole carcass in the ground above the high tide water mark or placing it in a waste disposal receptacle. Includes noxious fish such as carp, weather loach, climbing perch and gambusia

Plant Identification Skills

Both native and weed species should be identified prior to primary weed removal works and ongoing throughout the follow-up and maintenance periods. This is to maximise natural regeneration and reducing likelihood of accidental weed spraying to native vegetation. Regenerating species to be treated and maintained in a similar manner to newly planted revegetation tube stock. If contractor is unsure of species, advice should be sought by botanist, specialist contractor or confirmed with Queensland Herbarium. Refer to indicative Weed Treatment schedules derived from Queensland Herbarium for an indication of weed species and treatments.

Site specific notes

Based on site-specific data, the following weed management methods and techniques are recommended:

- Stick rake, grubbing, ploughing or slashing major accessible areas of Lantana where not on a slope greater than 15% or where no existing native values occur.
- Apply broadscale herbicide and spot spray during high germination summer periods (Nov-March). Utilise organic based Lantana targeted herbicides which minimise impacts on native vegetation regenerating within and surrounding Lantana patches.
- Control methods applied will be guided by methods outlined in the DAF's Improved practices catalogue: Best management practice for maintaining and improving land condition on grazing lands (DAF, 2017).
- Cautionary options to reduce run off or contamination from herbicides will be utilised within proximity to the Bremer River. Spot spraying of glyphosate will limit potential for impact as it is known to breakdown immediately on contact with soil and has no residual effect (Gray et al. 2006). It is understood that permits from relevant state Environment Protection Authorities may be required if herbicides are to be sprayed on riverbanks. If seen fit, other forms of control, such as mechanical or fire management, may be utilised adjacent to the Bremer River to reduce potential impacts to waterbodies.

Knowledge of Different Weed Management Techniques

A range of weed management techniques are available to combat a variety of weeds and scenarios. Refer to adjacent schedules and Appendix A for weed management techniques.

WEED MANAGEMENT TECHNIQUES	
METHOD	**DESCRIPTION**
Herbicide	**The herbicide weed control techniques described below provide a range of proven methods that can be used on a restoration site.**
Cut - Scrape-Paint	Cut the stem of the plant close to the ground (approximately 1-2cm) ensuring that soil does not come in contact with the cut surface. The cut can be made at a slight angle in order to increase the surface area that is exposed to the chemical. Apply herbicide immediately to the cut stump using poison pot and brush or dripper bottle. Using a knife, scrape the sides of the stump thoroughly to expose the green tissue. Apply herbicide to the scraped stump. The chemical must be applied within 10 seconds of the cut or scrape being made in order for it to be fully effective.
Cut - Paint	Cut the stem of the plant close to ground level. Apply herbicide to the cut stump using poison pot and brush or dripper bottle. This method is best suited to easy-to-treat weeds such as small-leaved privet (Ligustrum sinense), provided that the diameter of the stem at ground level is less than approximately three centimetres. If a glyphosate-/ metsulfuron methyl herbicide mix is being used in the poison pot, a greater range of weeds can be controlled using this method e.g. Easter cassia.
Scrape - Paint	Scrape as much of the stem as possible (one side of the stem) using a knife and apply herbicide to the scrape. Leave a small section of the vine unscraped and then twist the vine so that the next scrape is made on the opposite side of the stem to the preceding scrape. Continue along the length of the vine, scraping and painting as much of the stem as possible, with scraping to be concentrated along the thicker stems close to the root of the plant. This is the best method to use for madeira vine, as it allows the chemical to translocate to the underground storage organs and aerial tubers which may be hanging in large clusters above head height. This avoids the potential problem of tubers from cut stems left hanging in the trees from dropping to the ground and sprouting. When scraping madeira vine stems a deep scrape is advisable – scrape right through to the fibrous, stringy section of the stem, taking care not to sever the vine. This method is also suitable for treatment of ochna.
Over-spraying	Over-spraying involves the use of knapsacks or power sprayers to treat large expanses of weed such as lantana thickets. The foliage must be covered with herbicide but not to the point of running off the plant. The dead plants remain in place and can be cut down at a later stage. Prior to over-spraying, any weeds that are growing closely around established native plants must be hand removed or treated by cut-scrape-paint.
Spot-spraying	A knapsack filled with an appropriate herbicide mix is used by the operator to selectively control environmental weeds. A keen eye and an ability to distinguish between the native and weed species likely to be present, especially at seedling stage, is essential. Marker dye is added to the chemical mix to allow the operator to see what has already been sprayed, thus covering the ground weeds comprehensively and thoroughly Glyphosate and metsulfuron methyl are the main herbicides used for spot-spraying in ecological restoration, together with the addition of a penetrant and/or surfactant and marker dye.
Splatter Gun	This small gas-powered injector kit is fitted into a knapsack for easy carrying and delivers large droplets in a stream over the weed. The gun is used to deliver a concentrated herbicide (glyphosate or metsulfuron methyl) across large dense expanses of weed. The method is used for species such as lantana (ratio of 1:9 of glyphosate:water). Splatter gun involves spraying strips at one to two metre intervals over the thicket. The herbicide is then translocated throughout the entire plant. The method does not require the whole plant to be covered as in over-spray.
Oil-hang	Vines such as mile-a-minute (Ipomoea cairica) which produce long stolons extending many metres along the surface of the ground, are suited to the roll-hang method. Locate the base of the plant and carefully pull up the runners and roll them up. The resulting roll of vine is then hung in the fork of a tree to dry out as if it is left on the ground it is likely to re-shoot. Where runners are climbing up into a tree they are cut off at head height prior to the runner being rolled up – there is no need to pull cut vines down from trees as this action is likely to damage the tree. The base of the vine is treated using the cut scrape-paint method.
Gouge-paint	This method applies to plant species that have a fleshy underground storage organ, such as the large tuber that is often found at the base of madeira vine. It is also particularly appropriate for the treatment of climbing asparagus (Protasparagus plumosus). If using this technique on climbing asparagus, first cut the stems that are growing into the canopy at head height and also at the base. The fleshy rhizome can then be gouged, or alternatively in the case of climbing asparagus, it may be struck several times firmly with the head of a pair of loppers, allowing the brown outer covering of the crown to peel away exposing the white fleshy inner section of the rhizome for application of herbicide. Gouge out sections of the fleshy base with a knife and apply herbicide using a paint pot and brush or dripper bottle within 10 seconds.
Basal Barking	This method involves mixing an oil-soluble herbicide in diesel/kerosene and painting or spraying the full circumference of the trunk or stem of the plant from ground level to a height of approximately 45cm. Basal bark application is suitable for thin-barked woody weeds including saplings, regrowth and multi-stemmed shrubs. The method will usually result in the mortality of difficult-to-control woody weeds at any time of the year, provided the bark is not wet or too thick to enable the herbicide to penetrate. The method should not be used in wet weather, adjacent to waterways or in areas where native trees and shrubs are located. The use should be restricted to situations where a weed is particularly difficult to control e.g. cherry guava and where other methods have been unsuccessful.
Stem Injection	Large woody weeds such as camphor laurel, coral trees (Erythrina spp, Privet Ligustrum spp) and umbrella trees are generally treated by stem-injection. Holes are drilled at regular intervals around the base of the tree and exposed roots using a drill. A tree injection syringe attached to a small capacity knapsack is used to fill the holes with the herbicide. Stem-injection of trees can also be undertaken using a hatchet to create cuts in a 'brickwork pattern' in trunks of trees for the application of herbicide (known as tree frilling). Frilling is more labour intensive than drilling. The greatest benefit of stem injection is that the trees can be left standing in situ as they die, provided there is no risk to humans or infrastructure from falling limbs. This creates convenient roosts for birds and other animals and prevents the formation of large amounts of debris on the ground and damage to understorey plants which would result if the trees were to be cut down using a chainsaw.
Wick Wiping	Wick wipers can be manually used with a sponge or wick applicator, attached to a container filled with herbicide or as an attachment towed by a tractor. The manual method can be used to selectively apply herbicide to the leaves of weeds growing in sensitive situations. The handheld container can leak, and generally spot spraying would be recommended. The use of a tractor drawn wick wiper is used to control taller growing species such as introduced grasses and to encourage the growth of lower growing species. This method could be used in preparation for planting.
Mechanical	**Mechanical weed control involves the use of powered and non-powered equipment such as brush cutters, chainsaws, slashers, shovels, pruners, saws, etc. These methods are best used in situations where there is a large, uninterrupted stand of weeds.**
Dig and Bag	Dig and remove tuberous/ rhizomatous root systems. Remove roots or whole plant in hard/ compacted soils. Place in suitable container and remove from site, dispose of by deep burial, burn or burial at a land fill, must not place declared weed species in recycling (mulch).
Hand-Pull	Remove totally from ground by hand (human). Perform when soil is moist. Applicable to small infestations or areas of environmental sensitivity (including sensitive watercourses, when frogs are breeding, or presence of threatened species).
General Mechanical	May involve use of machinery (e.g. brush cutter, chainsaw, slasher, dozer, excavator). Suitable for large infestations and weed trees. Initially cost-effective but requires immediate revegetation of site or matting/ mulch application and extensive maintenance periods. Generates excessive soil and vegetation disturbance.

Note: Table adapted from a table in SEQERF

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CLIENT: Montauban Environmental Offsets

PROJECT: Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

DRAWING TITLE: REHABILITATION MANAGEMENT PLAN

DRAWING NO.: **7399 E 07 Peninsula RMP A**

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - *Planting Notes*

Burns and Soil Cultivation

Controlled cool burns – if weather allows, controlled cool burns are undertaken prior to cultivation or planting to remove grass and broadleaved plants. Qualified and experienced burning contractors are used in all instances, and in accordance with rural fire legislation, permit conditions and stakeholder/near neighbour notification requirements.

Cultivation of soil through ripping – this helps root penetration, increases moisture infiltration and retention around the planted tree's root zone and increases planting efficiency. In all instances, lines are ripped along contours. At no stage will downhill ripping be undertaken due to the high risk of channelling water in the rip lines and associated risk of serious erosion. The upper limit for contour ripping is 30 degrees. Below this, limits for contour ripping are to be set by the contractor, with operator safety being the primary consideration. Ripping must always take place during dry soil conditions, to enable effective soil fracture, and be completed several months before planting, to allow for settling of soil within the rip. Cultivation should not take place when soil moisture content is sufficient to allow the ripping implement to 'slice' through the soil without de-compacting it. Importantly:

- Ripping should always be undertaken with an angled steel plate affixed to the boot of the ripper to enable maximum soil decompaction at depth
- Minimum soil ripping depth is 30 cm – optimal soil ripping depth is 50 cm
- Ripped planting rows are spaced between 4 to 5 m apart to allow future vehicles access but retain planting density targets
- Machinery used to undertake ripping is typically a minimum D5 dozer, however, some high horsepower 4WD tractors or skid steers may also be suitable.

External Nursery

The Offset Provider will coordinate with local nurseries to source and propagate seedlings for planting. Species selection is critical in achieving the desired ecological restoration outcomes for rehabilitation sites. The planting palette proposed in this RMP has been derived from:

- Local Regional Ecosystem (RE) descriptions.
- Observed site native vegetation.
- Climatic and weather conditions observed on site (frost, salt-spray, etc.
- 'Pioneer' species are useful in site stabilisation and encouraging native regeneration (proposed to be planted in T2 subcanopy layer).
- Required foraging species to support regent honeyeater and swift parrot.
- Utilising flowering and fruiting species are useful to attract wildlife and result in introduction of seeds.
- Diverse vegetation layers (trees, shrubs, groundcovers).
- Species availability from seed propagation and or local nurseries.

Sourcing Seed Stock

Seed stock will be comprised of locally sourced seed stock where possible. Sourcing planting from local nurseries is the commonly chosen option and has the following benefits:

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

Swift parrot and regent honeyeater foraging tree species (E. melliodora, E. eugenioides and E. tereticornis) are required to be planted at the densities and quantities prescribed in this RMP in order to meet the required offset outcomes for the species. Densities of the other species may be modified where unable to meet the seed stock requirements, however, the volume of tube stock to be planted should be the same.

METHODOLOGY – PLANTING

Primary weed management works, broad scale planting (reconstruction and fabrication) and assisted natural regeneration is proposed to be undertaken. Prior to installation, the following items should be considered:

- Timing of planting
- Site preparation
- Planting density
- Planting installation

Timing of Planting

The timing of planting should ideally be aligned with the wet season in SEQ (summer and autumn). This minimises the need for intensive watering to establishment planting. Planting between February to May is the most beneficial as it also seeks to avoid intense heat periods of summer. Furthermore, planting at flood-prone and frost-prone locations should aim for plant establishment prior to the onsite of flooding / frost events. Despite this, it is understood planting may occur at various times within rehabilitation areas due to development timing needs.

Site Preparation

Site or planting preparation includes:

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

Planting Density

The planting capacity or number of trees (all species) that can be supported within each EMZ was determined based on a planting density of 1 tree per 10 m2 or 1000 trees per hectare for non-remnant paddock and 1 per 50 m2 or 200 trees for sparse regrowth, proposed in accordance with the South East Queensland Ecological Restoration Framework (SEQERF). The proposed density of trees per hectare depending on the EMZ was multiplied by the size of the EMZ (in hectares) to determine the maximum planting capacity. Waterbodies were excluded from potential planting areas.

Each EMZ was assigned a planting palette of tree species developed based on the ground-truthed pre-clear regional ecosystem mapping and local availability of seed stock. Each planting palette comprises a mix of preferred foraging species for the Swift Parrot, other eucalypt trees and pioneer species such as *Acacia sp.* and *Allocasuarina sp.* Preferred foraging tree species comprise a percentage of the total planting palette where it is suitable for the pre-clear RE and/or consistent with the local seed stock.

Refer to plant schedule for the proposed species composition and planting densities.

Planting Installation

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

Techniques are determined based on individual site conditions and will vary from bare seed, seed pods, drone seeding, seedling planting by ground machine, or spades/mattocks, or a combination of several techniques across the site.

Where cultivation has occurred, seedlings are planted into the prepared rip-lines. Seedlings should be planted in cultivated or uncultivated sites at a depth to make good contact with moist soil, and the soil then compressed around the seedling to remove any air pockets.

Planting should be of sufficient depth to ensure the entire root ball is buried with a minimum of five centimetres of natural ground covering the top of the root ball/potting mix. The stem of the seedling should be as vertical as possible.

Spreading bare seeds onto the top of the ground by hand or machine has a very low germination rate and requires high volumes of seed and good soil to seed contact to be successful. A high degree of pre-plant preparation is required before direct seeding is undertaken. Relatively flat open sites with little ground layer competition and sandy soils could be suitable for direct seeding by machine. Inaccessible sites with good pre-plant ground layer vegetation control could be suitable for drone dispersal. Tube stock of native trees and shrubs should be planted into moist soil with good soil to seed contact at an optimum depth to maximise the seed germination. Seeds of the same species combined with various materials (e.g. clay) into a small pod shape can be used to reduce seed predation by insects, protect the seeds from adverse weather conditions, and increase germination. Inaccessible sites with good pre-plant ground layer vegetation control may be suitable for drone or manual dispersal of seed pods.

- Timing must occur during seasons of high rainfall and mild temperatures. Dry weather conditions, extreme high temperatures, and extreme low temperatures will have a negative impact on seed germination and seedling survival.
- Seedling types must be a variety of local provenance genetics to ensure future resilience and ecological benefits. Multiple seedlings can be grown in a solid tray or individually in 50mm tube stock pots. Transplanting the tallest, most mature seedlings with solid mature root ball density maximises the survival and early growth rate of the seedlings.
- Fertilising seedlings is important just prior to planting. Alternately a liquid fertilizer can be added to the water when the seedlings are soaked on the day of planting. A complete, slow-release fertiliser is recommended, and is to be administered appropriately during planting. Topdressing with slow-release fertiliser is preferred to avoid toxic levels of fertiliser accumulating in the plant hole around the plant roots.
- Moisture is a key element to reduce seedling transplant shock. The ground should have a full moisture profile, the seedlings should be soaked fully before planting, and there should be a high chance of rain after planting. Hand watering planted seedlings should be considered only as a last resort. Planting seedlings provides an opportunity to have the greatest control over forest design.
- Maps, including species combinations, will inform the planting contractors of the species mix for each planting site, the density and spacing of the seedlings and the specific location of each species mix across the site. Seedlings of the same species can be planted in small groups or spread randomly across the site.
- Quality control is undertaken at the time of planting. Clear instructions to planting contractor is required to ensure the planting quality standard is understood. This is usually best undertaken on the same day as contractor induction to make sure the planters understand the quality standards from day one. Any trees not planted correctly, or planted at the incorrect spacing, will need to be reworked at the contractor's cost. Further inspection of the planting work will be undertaken prior to completion of the planting work to ensure the standard and spacing requirements have been met. Invoices received from the planting contractor cannot be paid until the final inspection has been undertaken and any problems rectified. Work that does not meet the standard will need to be re-done as soon as possible at the expense of the contractor.

T2/shrub species are to be planted between T1 canopy tree rows. Groundcovers are to be dispersed evenly throughout the area.

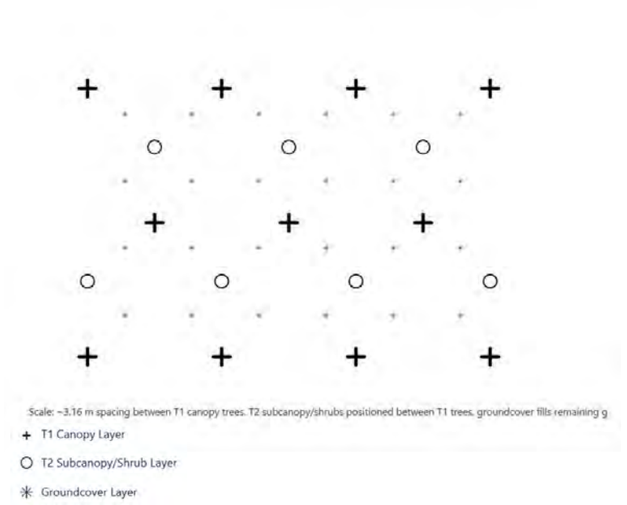


Figure 1: Proposed planting arrangement for complete reconstruction

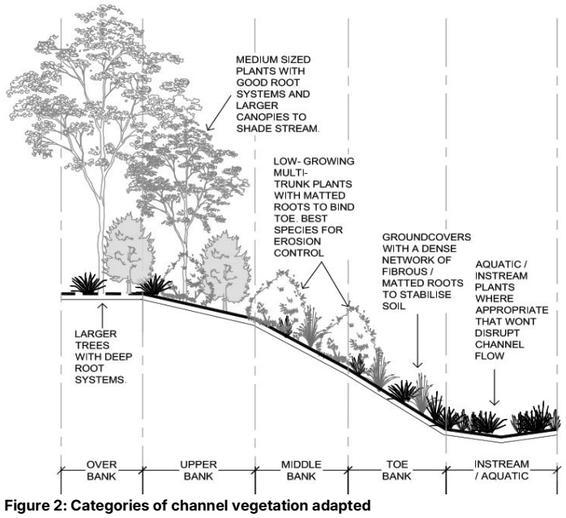


Figure 2: Categories of channel vegetation adapted

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PROJECT: Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

DRAWING TITLE: REHABILITATION MANAGEMENT PLAN

DRAWING NO.: **7399 E 08 Peninsula RMP A**

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - *Maintenance and Monitoring*

METHODOLOGY – MAINTENANCE

By the maintenance stage, the vegetation community is at a point where native plant species are germinating and establishing, and canopy formation is occurring. Weed density is starting to decrease as the native plants which have been encouraged during the previous restoration works are able to out-compete the weeds. One of the fundamental principles of ecological restoration is that it attempts to create or re-establish an ecosystem that is self-sustaining. Therefore, it is the underlying goal that maintenance will eventually be decreased to a minimum. While this is not always possible, due to factors such as the continual reintroduction of weed propagules to the site from nearby residential areas; unfavourable seasons or weather event; persistent weed species; or global influences such as the enhanced greenhouse effect, it should always be strived for (source: SEQERF).

Maintenance works may include minor ongoing weed management and infill planting depending on site conditions.

Watering regime

Watering is a critical component during the establishment phase of ecological restoration. Watering regime is to be adjusted based on site conditions, species, and seasonal variability. Indicative intensive watering regime is as below.

Establishment Phase (0–12 months)

- Frequency:
  - Weeks 1–4: Water every 2–3 days, especially in sandy or well-drained soils.
  - Weeks 5–12: Reduce to twice weekly, depending on rainfall and soil moisture.
  - Months 4–12: Weekly deep watering during dry spells.
- Volume:
  - Apply 10–20 litres per plant for trees and shrubs.
  - Groundcovers require less water, but will require full root zone saturation.
- Method:
  - Use drip irrigation, tree bags, or slow-release watering systems to minimise runoff and evaporation.
  - Avoid overhead watering to reduce disease risk.
- Seasonal Adjustments
  - Summer (Dec–Feb): Increase frequency due to high evapotranspiration.
  - Autumn/Winter (Mar–Aug): Reduce watering unless dry conditions persist.
  - Spring (Sep–Nov): Resume intensive watering as temperatures rise.
- Monitoring and Adaptation
  - Check soil moisture at root depth using probes or manual inspection.
  - Observe plant stress indicators: wilting, leaf drop, discoloration.
  - Adjust watering based on species needs.

Pest management

Non-native vertebrate pests will be managed as part of the broad management of the offset prescribed under the OMP. Management will target non-native vertebrate predator and herbivore species which have potential to damage regenerating habitat areas. This includes wild dogs, European red foxes, feral cats, feral pigs and deer.

Weed control

Intensive weed control maintenance will be undertaken for at least two years after planting is completed, or until the planted seedlings are tall enough to access full sunlight and adequate soil moisture free from adjacent competing plants. Ongoing weed maintenance activities will be completed throughout the life of the offset with a focus on WONS. Care should be taken to ensure weed control approaches do not impact planted seedlings and herbicide application is used precisely and selectively to ensure no dieback to the plantings or developing understorey. Herbicide application must be undertaken by licensed and experienced contractors, and in accordance with registered label conditions and safety data sheet requirements at all times. Mechanical methods will be used where appropriate.

MONITORING AND REPORTING FRAMEWORK

Monitoring

Monitoring methods to track rehabilitation progress will comprise a mix of informal and formal monitoring methods to track progress against the proposed environmental outcomes for each MNES and objectives of this RMP. All monitoring will be undertaken by a suitably qualified Rehabilitation Contractor/Landscape consultant and/or Ecologist.

The utilisation of performance indicators as part of monitoring program is proposed as a way of measuring rehabilitation success during the establishment and maintenance phases of the offset. A table of performance indicators is provided in Appendix 02 and forms the basis of the monitoring framework proposed in this RMP. Performance indicators are metrics by which the rehabilitation success of the offset area will be assessed in a meaningful and regularised approach and will be primarily used to assist with on-ground activities such as planting success and the identification of degrading factors that may be negatively affecting the offset area.

Performance indicator targets represent aspirational targets developed based on the proposed planting palette and densities, BioCondition benchmarks (v3.6) for the relevant regional ecosystems and anticipated response of performance indicators to the proposed rehabilitation regime.

The use of a targeted and regular monitoring program using performance indicators will provide a) comparable data during establishment and maintenance and b) consistent feedback and prompt when additional maintenance activities are required which can be communicated clearly and effectively to rehabilitation contractors. These metrics are additional to the prescribed habitat quality monitoring methods in the OMP.

A specific, repeatable methodology for obtaining planting data and provide benchmarks that align with offset objectives is proposed under the accompanying informal and formal monitoring methods, described below.

It is important for the long-term success of a habitat establishment project that both growth and survival are monitored at regular intervals. An intensive monitoring program is proposed whereby the offset area is monitored quarterly using informal and formal monitoring techniques for one year following planting during the initial establishment phase, then bi-annually until Year 5, then annually until Year 10.

Informal

Informal or qualitative monitoring techniques will be employed as part of the offset monitoring. Informal monitoring methods are less time-consuming and technical and form an important tool for determining ecological restoration success. Informal monitoring will occur through site inspections at prescribed monitoring intervals and will include the following techniques:

1. Photo monitoring, and
2. Visual assessment.

Photo monitoring

Photo monitoring is a cost-effective and objective method to visually assess plant survival and growth. Photo monitoring can be used to build a consistent reference point for rehabilitation progress and provide a visual time series of the offset area from a baseline state to a self-sustaining state. Permanent photo points will be established in the first year of the offset commencement prior to any works commencing on-site (weed management or planting) using a star picket marked with fluorescent yellow safety cap or painted timber stakes. This will enable photos to be taken of the site at regular intervals as it is being restored. Photo point locations will be spread between EMZ 1 and EMZ 2 at representative locations of each EMZ. Indicative photo monitoring locations are provided in Appendix 03 with locations to be finalised by the overseeing qualified Rehabilitation Contractor/Landscape Consultant and/or Ecologist.

Photo monitoring will use the following method to ensure adequate data collection and consistency across monitoring events as recommended by the *Guide to photo monitoring of ecological restoration projects* (OEH, 2018):

- Each photo will include the established star picket demarcating the photo point location to create a fixed reference object in the field of view.
- Point the photo towards an established compass bearing (e.g. 55° North) for the photo point location.
- Take multiple photos (left, right, centre) allowing for each image to overlap to create a panoramic view. This will increase the coverage and representativeness of the scene/subject.
- Always take the photo from the same point, and at the same height.
- Use the same camera or the same type of camera each time the photo is taken.
- Minimise sun glare and shadow in the photo and try to take photos at the same time of day.
- Identify key species that will be visible in the photo.
- Take along copies of the original photos for reference when returning to the photo points to help match the field of view contents.

Visual assessment

At each photo monitoring location, a visual assessment will also be completed whereby general observations and commentary relating to the performance indicators (refer Appendix 02) such as mortality rate, species, weed/WONS presence and other degrading factors are recorded.

Reporting

Following each photo monitoring event, a Photo Monitoring Report will be prepared which will include the following information:

- Photo set at each monitoring location.
- Commentary on mortality rate and presence of WONS/other weeds at a minimum with any additional relevant observations to inform adaptive management such as species-specific responses or herbivory.
- Adaptive management (if required).

Photo Monitoring Reports will be distributed to the rehabilitation contractor to instigate rectification works. An example Photo Monitoring Template is provided at Appendix 03.

After each monitoring event, photos will be transferred to a master photo monitoring data template, designed to show changes in each photo monitoring location between events. Refer to Appendix 03 for the master photo template located in the Photo Monitoring Report Template.

Formal

Formal monitoring of rehabilitation works involves collecting quantitative data at prescribed monitoring intervals using a combination of monitoring methods and techniques. Formal monitoring provides data that cannot be measured by informal observations and can be easily compared against quantitative performance indicators. This will include:

- MHQA transects at 5-yearly intervals (5, 10, 15 and 20 years) following the commencement of the offset. Transects will be repeated at baseline locations before the end of the relevant monitoring interval (e.g. before the end of Year 5) and will be completed in accordance with the baseline survey methodologies described in the OMP.
- 10 x 10 metre / 100 m^2 plots (quadrats) to be completed quarterly for the first year following the completion of planting, bi-annually until the end of Year 5 and annually until the end of Year 10. This monitoring method is considered additional to the MHQA monitoring.

Quadrat method

The use of a plot or quadrat is a widely used method for collecting vegetation composition data in a variety of environments. Variations of the method are described in various resources and utilise different size plots depending on factors such as the purpose of the study, time constraints and environmental factors (Hnatiuk et al. 2009; Thackway et al. 2008). The Wildflower Society of WA (Inc.) publication *Bushland Plant Survey, A Guide to Plant Community Survey for the Community* (Keighery, 1994) and the Department of Environment and Conservation resource *Establishing vegetation transects – Standard Operating Procedure No. 6.2* describe the use of a 10 x 10 m quadrat for vegetation monitoring.

Establishment of quadrat

A total of 4 quadrats will be established in EMZ 1 and 2 quadrats in EMZ 2. No specific number is prescribed under the published methods, with recommendation to increase the number of quadrats where feasible. The location of 4 in EMZ 1 and 2 in EMZ 2 will provide a representative and repeatable sample of the offset area. Indicative locations of the 10 x 10 m quadrats are shown on Appendix 03. Locations may be subject to change as part of the initial baseline set up depending on site factors.

During the initial set up of the quadrat each corner of the quadrat will be marked by a star picket or fence dropper and will be recorded using a GPS for ease in locating the quadrat for repeat surveys. A rope may be used to delineate the perimeter of the quadrat location. Refer to **Figure 3** for an example of the proposed set up.

Data will be interpreted as individual quadrats and averaged across quadrats to produce a mean set of values within each EMZ. Both forms of data representation will be used to inform management.



Figure 3. An example of an established 100 m2 quadrat (Clarke, 2009).

Data collection

Data within each quadrat will be collected against the performance indicators (refer Appendix 02) including:

- Native plant species richness (tree, shrub, groundcover)
- Number of juvenile and non-juvenile stems of eucalypt species
- Number of juvenile and non-juvenile stems of swift parrot foraging species (E. melliodora, E. eugenoides and E. tereticornis) and regent honeyeater foraging species (E. melliodora and E. eugenoides)
- Native plant mortality and rate of success of tree species (90% for foraging tree species or may trigger adaptive management)
- WONS weed cover (percentage)
- Other weed cover (percentage)
- Natural regeneration (yes/no)
- North/south/east/west photograph will be taken from the centre point of the quadrat

The first assessment will form the baseline post-planting result which will provide comparable data throughout the proposed monitoring timeframe.

Reporting

The results of the data collection will be detailed in a Rehabilitation Monitoring Report for each monitoring event and will be prepared by a suitably qualified Ecologist.

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REHABILITATION
MANAGEMENT PLAN

DRAWING NO.
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Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - *Monitoring and Adapative Management*

Reporting and Monitoring - Summary

The results of informal (photo monitoring and visual assessment) and formal monitoring (10 x 10 m quadrats) will be detailed in quarterly/bi-annual/annual monitoring reports. These reports will include a summary of overall success rate (namely of tree species), any degrading factors at the site that may or are currently affecting survival success and any recommended adaptive management measures.

The reporting schedule for the monitoring program is summarised in the table below.

Report	Purpose	Frequency	Responsible party
Milestone Survey Report *Details the results of MHQA, GHFF FHA and swift parrot and regent honeyeater foraging habitat assessment.*	Designed to demonstrate increase in value of offset area for Matters of National Environmental Significance (koala, grey-headed flying-fox, swift parrot and regent honeyeater) as proposed under the OMP.	Five-yearly at Years 5, 10, 15 and 20	Suitably qualified Ecologist as appointed by the Proponent
Photo Monitoring Report *Qualitative monitoring report showing photos of the offset area, commentary on rehabilitation progress and recommended adaptive management measures.*	Function is to provide regular assessment of the offset area and feedback to engaged rehabilitation contractors to guide on-ground works.	Quarterly during Year 1 Bi-annually from Years 2 to 5 Annually from Years 6 to 10	Suitably qualified Rehabilitation Contractor, Landscape Consultant or Ecologist as appointed by MEO
Rehabilitation Monitoring Report *Details the results of the quadrat monitoring program, assessment against the performance indicators (Appendix 02) and recommendations for adaptive management.*	Designed to provide a data-driven method to document and measure rehabilitation progress/success to further inform on-ground activities.	Quarterly during Year 1 Bi-annually from Years 2 to 5 Annually from Years 6 to 10	Suitably qualified Ecologist as appointed by MEO

ADAPTIVE MANAGEMENT

Adaptive management is an ongoing, systematic approach for improving rehabilitation outcomes by learning from existing management techniques. It is a cyclic process that involves:

1. Identification of unsuccessful treatments and new threats during monitoring events
2. Investigation of new and alternative treatments
3. Implementation of new / alternative management strategies based on best available knowledge
4. Review of new / alternative management strategies during monitoring

Adopting an adaptive approach to rehabilitation works is recommended to maximise environmental outcomes for the site. Once an area is revegetated, the survival and growth of plants needs to be assessed, monitored and managed. Plans need to be adaptive in order to respond to identified issues on the site.

Multiple corrective action triggers for adaptive management are proposed under the performance indicators (refer Appendix 02). This includes:

- Native plant mortality >10%
- WONS cover >5%
- Number of non-juvenile stems of swift parrot foraging species (*E. melliodora, E. eugenioides* and *E. tereticornis*) not increasing as proposed
- Number of non-juvenile stems of regent honeyeater foraging species (*E. melliodora* and *E. eugenioides*) not increasing as proposed

A survival rate of 90% of tree species is proposed to be achieved for the offset area with a focus on species identified as preferred or supporting foraging species for the Critically Endangered regent honeyeater and swift parrot. This is required in order to achieve the proposed offset outcomes for the species under the OMP.

Where survival rates are observed to be less than 90% as per qualitative and quantitative monitoring methods, this may indicate the presence of a degrading factor not previously identified or considered at the site and may require adaptive management measures to be considered and implemented. Degrading factors are to be identified as part of regular monitoring and will form the basis for actioning adaptive management.

Adaptive management measures may include a combination of the following:

- Identify and address the degrading factor (e.g. soil issue, pests, species failure).
- Remedial plantings in areas of dieback to bolster survival rates to above 90%.
- Introduce a different species *i.e.,* if one plant species consistently dies on a site, consider using in its place a species that is performing well.
- Adjust planting methods such as using advanced tube stock or direct seeding, modifying site preparation techniques.
- Modify weed management techniques or frequency where WONS exceed 5%.

REHABILITATION TEAM RESPONSIBILITIES

It is critical for all parties to understand their responsibilities as part of the rehabilitation 'team'.

PARTY	DESCRIPTION
Proponent	Ensure all consultants, contractors, sub-contractors or others utilising the area are aware of the Rehabilitation Plan. Appoint appropriate consultants and contractors to undertake works as prescribed on the drawings. Provide security via an uncompleted works bond and maintenance bond for the cost of works if required. Cover costs of all resources to ensure works are completed as per approved plans.
Consultants	Brief proponent on their requirements in implementing and maintaining works as per the Rehabilitation Plan. Attend monitoring inspections. Undertake monitoring and reporting as per this plan. Be available to respond to technical queries to the approved documentation when on-site conditions require changes. Liaise with team throughout all stages of approval, initial works and maintenance of works.
Environmental Coordinator	Provide technical expertise via commentary on the approval of documentation. Attend monitoring inspections. Reduce and release securities held against works at the completion of successful milestone inspections. Be available to respond to technical queries to the approved documentation when on-site conditions require changes. Accept and review maintenance reports as dictated (if required in this plan).
Contractor	Ensuring implementation of works and compliance with this Rehabilitation Plan. Attend monitoring inspections. Has a minimum Certificate III in Conservation and Land Management, or a Certificate III in Horticulture, or a Certificate III in Rehabilitation Construction, or equivalent experience in rehabilitation. Hold relevant licenses in applicable weed management/ revegetation/ fauna management, any required insurances for scope of works and an understanding of required Laws, Act, Policies and Guidelines. Recommend changes to the documentation when specific experience or on-site conditions require so.

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Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - APPENDIX 01 *Weed Treatment and Removal (i)*

Queensland Herbarium Invasive Naturalised Plants In South East Queensland

Rk	Family	Scientific and common names	Sr	R	S	LFS	Non-Chemical Control	Chemical Control
1	Mimosaceae	Acacia boliviana (Bolivian wattle)	1	1	4	T/O	Mechanical or chain removal.	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
2	Mimosaceae	Acacia farnesiana (mimosa bush)	6	15	3	T/A	Mechanical removal of small plants.	
3	Mimosaceae	Acacia nilotica subsp. indica (prickly acacia)	3	3	4.4	T/A	Mechanical or chain removal.	
4	Cactaceae	Acanthocereus tetragonus (sword pear)	1	1	3	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
5	Polygonaceae	Acetosa sagittata (rambling dock)	4	18	4	V/U	Tubers: Dig up, bag and remove.	
6	Agavaceae	Agave americana (century plant)	4	9	4	S/OA	Dig out by hand or machine	
7	Agavaceae	Agave sisalana (sisal)	2	4	4	S/OA	Dig out by hand or machine	
8	Agavaceae	Agave vivipara var. vivipara (sisal)	2	3	4	S/OA	Dig out by hand or machine	
9	Asteraceae	Ageratina adenophora (crofton weed)	6	38	5	H/O	Hand pull and hang to dry.	
10	Asteraceae	Ageratina riparia (mistflower)	5	38	5	H/O	Hand pull and hang to dry.	
11	Asteraceae	Ageratum houstonianum (blue billygoat weed)	8	81	4	H/UO	N/A	
12	Simaroubaceae	Ailanthus altissima (tree of heaven)	1	3	4	T/O	Seedlings: Hand pull	
13	Amaranthaceae	Alternanthera philoxeroides (alligator weed)	1	3	5	Ha/U	Physical removal of plant should not be attempted	
14	Poaceae	Andropogon virginicus (whisky grass)	6	14	4	H/A	Hand pull or dig out small infestations.	
	Basellaceae	Anredera cordifolia (madeira vine)	8	16	5	V/O	Small Vines & Tubers: Hand pull. Bag and dispose.	
16	Asclepiadaceae	Araujia sericifera (mothvine)	9	38	4	V/O	Seedlings & Vines: Hand pull. Bag and remove fruit.	
17	Aristolochiaceae	Aristolochia elegans (Dutchman's pipe)	8	30	4	V/O	Stems: Hand pull; Fruit: Bag and remove.	
18	Poaceae	Arundo donax (giant reed)	1	4	4	H/O	Physical removal of small infestations.	
19	Asclepiadaceae	Asclepias curassavica (red cotton bush)	9	43	3	S/O	Hand pull; Slash	
20	Asparagaceae	Asparagus aethiopicus cv. Sprengeri (asparagus ground fern)	5	35	5	H/O	Dig out unwanted plants and dispose of at the appropriate council landfill. Remove the entire crown of underground stem of plant to prevent regrowth	
21	Asparagaceae	Asparagus africanus (ornamental asparagus, asparagus fern)	7	26	5	V/O	Dig out roots and dispose of at local council landfill site. Remove entire crown and underground stem to prevent regrowth	
22	Asparagaceae	Asparagus plumosus (asparagus fern)	4	8	4	V/O	Rhizomes: crown and hang to dry.	
23	Poaceae	Axonopus compressus (broad leaved carpet grass)	5	23	4	H/AO	Cut stems from roos.	
24	Asteraceae	Baccharis halimifolia (groundsel bush)	10	168	5	S/O	Seedlings: Hand pull	
25	Asteraceae	Bidens pilosa (cobbler's pegs)	10	110	4	H/U	Hand pull or cultivation.	
26	Poaceae	Brachiaria decumbens (signal grass)	4	14	4	H/A	Grazing	
27	Poaceae	Brachiaria mutica (para grass)	6	18	4	Ha/A	Grazing	
28	Crassulaceae	Bryophyllum daigremontianum x B. delagoense (hybrid mother-of millions)	6	15	5	H/O	Hand pull and dispose	
29	Crassulaceae	Bryophyllum delagoense (mother of millions)	8	38	5	H/O	Hand pull and dispose	
30	Crassulaceae	Bryophyllum pinnatum (resurrection plant)	6	17	4	H/O	Hand pull and dispose	
31	Buddlejaceae	Buddleja madagascariensis (buddleja)	5	6	3	S,V/O	N/A	
32	Cabombaceae	Cabomba caroliniana (cabomba, fanwort)	4	12	5	Ha/F	Mechanical removal of small infestations	
33	Caesalpiniaceae	Caesalpinia decapetala (thorny poinciana)	4	20	4	S,V/O	Seed-heads: Bag and remove.	
34	Brassicaceae	Cakile edentula (American sea rocket)	4	24	4	H/U	Manually grub and destroy.	
35	Commelinaceae	Callisia fragrans (purple succulent)	3	9	4	H/O	N/A	
36	Cannaceae	Canna indica (canna lily)	3	9	3	H/O	Dig out entire plant	
37	Sapindaceae	Cardiospermum grandiflorum (balloon vine)	7	31	4	V/O	Seedlings & Small Vines: Hand Pull	
38	Apocynaceae	Cascabela thevetia (syn. Thevetia peruviana) (yellow oleander)	5	9	3	ST/O	Hand pull small infesttions. Slashing can be used but should be followed up by herbicide application.	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
39	Apocynaceae	Catharanthus roseus (pink periwinkle)	5	22	4	S/O	Hand pull	
40	Ulmaceae	Celtis sinensis (Chinese celtis)	8	19	5	T/O	Remove when small. Hand pull or dig out small seedlings. Combine dozing, burning and controlled grazing for large infestations	
41	Poaceae	Cenchrus ciliaris (buffel grass)	4	15	4	H/A	Hand or mechanical removal of young plants	
42	Poaceae	Cenchrus echinatus (Mossman river grass)	8	43	3	H/A	Hand or mechanical removal of young plants	
43	Solanaceae	Cestrum parqui (green cestrum)	6	36	4	S/O	Seedlings: Hand pull	
44	Caesalpiniaceae	Chamaecrista rotundifolia (round-leaf cassia)	6	14	3	ST/A	Seedlings: Hand pull	
45	Poaceae	Chloris gayana (Rhodes grass)	9	55	4	H/A	Hand pulling and removal and digging of larger clumps	
46	Asteraceae	Chrysanthemoides monilifera subsp. rotundata (bitou bush)	3	23	5	S/OA	N/A	
47	Lauraceae	Cinnamomum camphora (camphor laurel)	7	25	5	T/O	Seedlings: Hand pull	
48	Rubiaceae	Coffea arabica (coffee)	3	7	3	ST/A	Saplings: Hand pull	
49	Arecaceae	Colocasia esculenta (taro)	3	4	3	H/AO	Hand pull.	
50	Commelinaceae	Commelina benghalensis (hairy wandering jew)	4	7	4	H/O	Collect and Bag	
51	Asteraceae	Conyza bonariensis (flax-leaf fleabane)	7	38	3	H/U	Hand or mechanical removal of small infestations	
54	Poaceae	Cortaderia selloana (pampas grass)	2	1	4	H/O	Small Plants: dig out by hand or machine	
55	Asclepiadaceae	Cryptostegia grandiflora (rubber vine)	6	19	4	V/O	Scattered or medium-density infestations: Where possible, repeated slashing close to ground level is recommended.	
56	Poaceae	Cynodon dactylon (couch, Bahama grass introduced cultivars)	10	45	4	H/OA	Hand pull small infestations, removing all roots or smother with mulch.	
57	Cyperaceae	Cyperus brevifolius (Mullumbimby couch)	8	53	3	H/O	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
58	Cyperaceae	Cyperus involucratus (African sedge)	6	15	4	Ha/OF	Each has to be dug out with a spade and the entire plant turned over, exposing the root system while making sure all aerial parts of the plant are completely covered.	
59	Fabaceae	Desmodium intortum (greenleaf desmodium)	4	11	3	H/A	Hand pull or crown and dispose	
60	Fabaceae	Desmodium uncinatum (silverleaf desmodium)	5	14	4	H/A	Hand pull or crown and dispose	
61	Poaceae	Digitaria didactyla (Queensland blue couch)	9	70	4	H/A	Hand pull or cultivation	
62	Poaceae	Digitaria eriantha (pangola grass)	5	20	3	H/A	Hand pull or cultivation	
63	Verbenaceae	Duranta erecta (duranta)	6	14	4	ST/O	Shrubs: CS&P (1:1.5)	
64	Poaceae	Echinochloa colona (awnless barnyard grass)	9	44	3	H/A	Hand or mechanical removal of small infestations	
65	Poaceae	Echinochloa crus-galli (barnyard grass)	6	34	4	H/A	Hand pull or dig out small infestations.	
66	Hydrocharitaceae	Egeria densa (egeria waterweed)	2	7	4	Ha/F	Hand pulling, cutting and digging with machines effective	
67	Pontederiaceae	Eichhornia crassipes (water hyacinth)	4	8	5	Ha/OF	Mechanical removal of small infestations	
68	Poaceae	Eleusine indica (crowsfoot grass)	8	55	4	H/A	Pull and chip. Replant with native couch.	
69	Poaceae	Eragrostis curvula (African lovegrass)	7	29	4	H/U	Chipped out before they flower. When chipping out the plant ensure that the tussock crowns are removed, as this will prevent regrowth. If in seed, the stems must be cut and bagged first.	
70	Rosaceae	Eriobotrya japonica (loquat)	3	5	3	T/O	Seedlings: Hand pull	
71	Fabaceae	Erythrina crista-galli (cockspur coral tree)	2	4	4	T/O	N/A	
72	Myrtaceae	Eugenia uniflora (Brazilian cherry)	4	19	4	ST/O	N/A	
73	Euphorbiaceae	Euphorbia cyathophora (painted spuge)	8	20	3	H/O	Hand pull	
74	Euphorbiaceae	Euphorbia heterophylla (milk weed)	5	12	3	H/O?	Hand pull	
75	Agavaceae	Furcraea foetida (Cuban hemp)	3	4	4.3	S/OA	Dig out by hand or machine	
76	Agavaceae	Furcraea selloa (hemp)	1	2	4	S/OA	Dig out by hand or machine	
77	Caesalpiniaceae	Gleditsia triacanthos (honey locust)	7	12	4	T/O	For the control of dense infestations on grazing land, burning followed by spot spraying is an economical control method.	
78	Colchicaceae	Gloriosa superba (glory lily)	3	26	4	V/O	N/A	
79	Asclepiadaceae	Gomphocarpus physocarpus (balloon cotton bush)	10	132	4	S/OU	Slash in winter and burn cuttings. Wanderer Butterfly can also be used as biological control.	

= Weed Species Recorded on site

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References:

South East Queensland Ecological Restoration Framework (2012)

AMENDMENTS

ISSUE	DATE	DESCRIPTION	DRAWN	CHECKED
A	29/10/2025	CLIENT DRAFT	TF	AW

CLIENT: Montauban Environmental Offsets

PROJECT: Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

DRAWING TITLE: REHABILITATION MANAGEMENT PLAN

DRAWING NO.: **7399 E A01_1 Peninsula RMP A**

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - APPENDIX 01 *Weed Treatment and Removal (ii)*

Queensland Herbarium Invasive Naturalised Plants In South East Queensland								
Rk	Family	Scientific and common names	Sr	R	S	LFS	Non-Chemical Control	Chemical Control
80	Asteraceae	Gymnocoronis spilanthoides (Senegal tea)	3	4	5	Ha/F	Place plant material in a sealed plastic bag, leave in sunlight to rot then burn or dispose of at a council-approved land fill tip	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance.
81	Cactaceae	Harrisia martinii (harrisia cactus)	2	4	4	S/O	The use of the biological mealy-bug agent is recommended	
82	Zingiberaceae	Hedychium coronarium (wild ginger)	2	2	4	H/O	Small Plants: Hand pull and dispose	
83	Zingiberaceae	Hedychium gardnerianum (ginger lily)	1	3	4	H/O	Small Plants: Hand pull and dispose	
84	Malpighiaceae	Hiptage benghalensis (hiptage)	3	5	4	S,V/O	Hand pull small infestations.	
85	Acanthaceae	Hygrophila costata (Glush weed)	3	7	5	Ha/F	Hand pull smal infestations. Can be controlled by planting competitive native species.	
86	Poaceae	Hymenachne amplexicaulis cv. Olive (hymenachne)	1	1	4	Ha/A	A combined approach of different control methods including mechanical, chemical and biological with land management practices is most effective	
87	Acanthaceae	Hypoestes phyllostachya (polka-dot plant	3	5	4	H/O	Hand pull or crown and dispose	
88	Balsaminaceae	Impatiens walleriana (balsam)	2	6	4	H/O	N/A	
89	Convolvulaceae	Ipomoea cairica (mile-a-minute)	7	56	4	V/O	Vines & Runners: hand pull, roll up and hand up to dry.	
90	Convolvulaceae	Ipomoea indica (blue morning glory)	5	24	4	V/O	Vines and Runners: hand pull, roll up and hang to dry.	
91	Bignoniaceae	Jacaranda mimosifolia (jacaranda)	4	12	3	T/O	Seedlings: Hand pull	
92	Euphorbiaceae	Jatropha gossypiifolia (cotton-leaf physic nut, bellyache bush)	1	1	4	S/O	Hand pull	
93	Juncaceae	Juncus articulatus (jointed rush)	1	2	4	Ha/FO	Hand pull.	
94	Acanthaceae	Justicia betonica (squirreltail)	2	4	4	S/O	Hand pull smal infestations. Can be controlled by planting competitive native species.	
95	Sapindaceae	Koelreuteria elegans (Chinese rain tree)	1	1	3.6	T/O	Seedlings: Hand pull	
96	Verbenaceae	Lantana camara var. camara (lantana)	10	455	5	S/O	Seedlings: Hand pull	
97	Verbenaceae	Lantana montevidensis (creeping lantana)	8	62	5	S/O	Fire and/or mechanical control	
98	Mimosaceae	Leucaena leucocephala (leucaena)	6	14	4	ST/A	Small plants: Hand pull or mechanical removal	
99	Oleaceae	Ligustrum lucidum (tree privet)	5	9	5	T/O	Seedlings: Hand pull	
100	Oleaceae	Ligustrum sinense (Chinese privet)	4	11	5	T/O	Seedlings: Hand pull	
101	Liliaceae	Lilium formosanum (Taiwan lily)	5	10	4	H/O	Hand pull or crown and dispose	
102	Caprifoliaceae	Lonicera japonica (Japanese honeysuckle)	3	6	4	V/O	Vines and Runners: hand pull, roll up and hang to dry.	
103	Solanaceae	Lycium ferocissimum (African boxthorn)	1	5	4.4	S/O	N/A	
104	Bignoniaceae	Macfadyena unguis-cati (cat's claw creeper)	5	36	5	V/O	Tubers: crown or dig up, bag and remove.	
105	Fabaceae	Macroptilium atropurpureum (siratro)	8	39	4	V/A	N/A	
106	Fabaceae	Macrotyloma axillare (perennial horse gram)	4	12	3	V,H/A	N/A	
107	Poaceae	Melinis minutiflora (molasses grass)	5	17	5	H/A	Grazing or mowing	
108	Poaceae	Melinis repens (red Natal grass)	10	134	4	H/A	Grazing or mowing	
109	Mimosaceae	Mimosa pudica (common sensitive plant)	4	12	4	S/A	N/A	
110	Moraceae	Morus alba (white mulberry)	3	10	3	T/O	N/A	
111	Rutaceae	Murraya paniculata cv. Exotica (murraya)	6	26	4	S/O	Seedlings: Hand pull	
112	Haloragaceae	Myriophyllum aquaticum (parrot's feather)	3	15	4	Ha/F	N/A	
113	Brassicaceae	Nasturtium officinale (Qld use Rorippa nasturtium-aquaticum) (watercress)	7	19	4	Ha/FU	Manually grub and destroy.	
114	Fabaceae	Neonotonia wightii (glycine)	5	16	5	H/A	N/A	
115	Nymphaeaceae	Nymphaea caerulea subsp. zanzibarensis (blue lotus)	4	17	4	Ha/OF	Hand pull small infestations.	
116	Nymphaeaceae	Nymphaea mexicana (yellow waterlily)	2	4	4	Ha/OF	Hand pull small infestations.	
117	Ochnaceae	Ochna serrulata (ochna)	7	33	5	S/O	N/A	
118	Onagraceae	Oenothera drummondii subsp. drummondii (beach evening primrose)	3	17	4	H/O	Hand pull	
119	Oleaceae	Olea europaea (olive)	2	6	4	T/A	Seedlings: Hand pull	
120	Cactaceae	Opuntia aurantiaca (tiger pear)	1	2	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
121	Cactaceae	Opuntia imbricata (rope pear)	1	1	4	H/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
122	Cactaceae	Opuntia monacantha (drooping tree pear, syn. O. vulgaris)	2	3	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
123	Cactaceae	Opuntia stricta (common prickly pear)	7	67	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
124	Cactaceae	Opuntia tomentosa (velvet tree pear)	8	46	4	S/O	Biological controls available: cactoblastis cactorum successful. Mechanical control difficult. Fire can be used.	
125	Poaceae	Panicum maximum (green panic and guinea grass)	8	78	5	H/A	Hand or mechanical removal of small infestations	
126	Asteraceae	Parthenium hysterophorus (parthenium weed)	6	14	4	H/U	Hand pulling of small areas is not recommended	
127	Poaceae	Paspalum conjugatum (paspalum grass)	7	38	4	H/A	Cut below crown.	
128	Poaceae	Paspalum dilatatum (paspalum grass)	10	30	4	H/A	Hand pull or dig up	
129	Poaceae	Paspalum mandiocanum (broad leaf paspalum)	3	6	4	H/A	N/A	
130	Poaceae	Paspalum notatum (bahia grass)	4	10	4	H/A	Hand pull or dig up	
131	Passifloraceae	Passiflora edulis (passion fruit)	6	12	3	V/AO	Hand Pull	
132	Passifloraceae	Passiflora foetida (stinking passion flower)	7	50	4	V/O	Hand Pull	
133	Passifloraceae	Passiflora suberosa (cork passionflower)	8	166	4	V/O	N/A	
134	Passifloraceae	Passiflora subpeltata (white passion flower)	10	60	4	V/O	Stems: Hand pull	
135	Scrophulariaceae	Paulownia tomentosa (paulownia)	3	5	4	T/AO	Seedlings: Hand pull	
136	Poaceae	Pennisetum alopecuroides (swamp foxtail)	7	29	4	H/O	Hand Pull	
137	Poaceae	Pennisetum clandestinum (kikuyu grass)	4	12	4	H/A	Hand Pull	
138	Poaceae	Pennisetum purpureum (elephant grass)	2	9	4	H/O	Grazing or mechanical removal	
139	Poaceae	Pennisetum setaceum (fountain grass)	3	11	3	H/O	Hand Pull	
140	Verbenaceae	Phyla canescens (lippia, Condamine couch)	3	4	4	Ha/O	A combined approach of different control methods including chemical and mechanical with land management practices is most effective	
141	Poaceae	Phyllostachys aurea (fishpole bamboo)	1	2	4	S/O	N/A	
142	Phytolaccaceae	Phytolacca octandra (inkweed)	10	50	3	H/O	Hand pull or crown	
143	Pinaceae	Pinus elliottii (slash pine)	4	22	4	T/A	Seedlings: Hand pull; Saplings and Trees: cut close to ground or ring-bark	
144	Araceae	Pistia stratiotes (water lettuce)	3	8	4	Ha/OF	Mechanical removal of small infestations	
145	Mimosaceae	Prosopis pallida (algaroba)	2	2	4	ST/O	When using mechanical control methods, it is important to remove the bud zone of the root system (about 30 cm below the ground surface). If this is not removed, re-shooting can occur.	
146	Rosaceae	Prunus munsoniana (wild goose plum)	7	31	4	ST/A	Seedlings: Hand pull	
147	Myrtaceae	Psidium guajava and P. guineense (yellow guava and West Indes guava)	4	7	4	ST/AO	N/A	
148	Fabaceae	Pueraria lobata (kudzu)	3	4	4	V,S/O	Slash; Diminish by shading site	
149	Bignoniaceae	Pyrostegia venusta (flame vine)	1	1	4	V/O	N/A	
150	Rosaceae	Rhaphiolepis indica (Indian hawthorn)	3	10	4	ST/O	Seedlings: Hand pull	

= Weed Species Recorded on site

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References:

South East Queensland Ecological Restoration Framework (2012)

AMENDMENTS

ISSUE	DATE	DESCRIPTION	DRAWN	CHECKED
A	29/10/2025	CLIENT DRAFT	TF	AW

CLIENT: Montauban Environmental Offsets

PROJECT: Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

DRAWING TITLE: REHABILITATION MANAGEMENT PLAN

DRAWING NO.: **7399 E A01_2 Peninsula RMP A**

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - APPENDIX 01 *Weed Treatment and Removal (iii)*

Queensland Herbarium Invasive Naturalised Plants In South East Queensland

Rk	Family	Scientific and common names	Sr	R	S	LFS	Non-Chemical Control	Chemical Control
150	Rosaceae	Rhaphiolepis indica (Indian hawthorn)	3	10	4	ST/O	Seedlings: Hand pull	Herbicides must be applied by appropriately qualified / supervised persons in accordance with the Agricultural Chemicals and Distribution Control Act 1966 at rates identified on registered product labels, or on an Australian Pesticides and Veterinary Medicines Authority (APVMA) issued off-label permit where applicable. Refer to South East Queensland Ecological Restoration Framework for additional guidance
151	Euphorbiaceae	Ricinus communis (castor oil plant)	7	20	4	S/O	Seedlings: Hand pull	
152	Phytolaccaceae	Rivina humilis (baby pepper)	8	61	4	H/O	Hand pull and hang to dry.	
153	Rosaceae	Rubus bellobatus (kittatinny blackberry)	5	22	4	S/O	Slashing hinders growth, giving some control if plants are slashed before they seed	
154	Rosaceae	Rubus discolor (R. fruticosus complex, a blakberry)	4	10	4	S/OA	Slashing hinders growth, giving some control if plants are slashed before they seed	
155	Rosaceae	Rubus ellipticus (yellowberry)	4	26	4	S/O	Slashing hinders growth, giving some control if plants are slashed before they seed	
156	Acanthaceae	Ruellia malacosperma (ruellia)	5	16	4	H/O	N/A	
157	Ruppiaceae	Ruppia maritima (sea tassel)	2	8	4	Ha/F	Hand pull or dig up	
158	Alismataceae	Sagittaria graminea var. platyphylla (sagittaria arrowhead)	3	7	4	Ha/FO	Physical removal of small infestations.	
159	Lamiaceae	Salvia coccinea (red salvia)	9	46	4	H/O	remove small areas by hand or machine	
160	Salviniaceae	Salvinia molesta (salvinia)	8	57	5	Ha/F	Mechanical removal of small infestations; Salvinia weevil (Biological control)	
161	Caprifoliaceae	Sambucus canadensis (American elder)	3	7	3	ST/O	Vines and Runners: hand pull, roll up and hang to dry.	
162	Dracaenaceae	Sansevieria trifasciata (sansevieria)	2	7	3	H/O	Hand pull or dig up	
163	Anacardiaceae	Schinus terebinthifolius (broad-leaf pepper tree)	6	49	5	T/O	Seedlings: Hand pull	
164	Asteraceae	Senecio madagascariensis (fire weed)	6	28	4	H/U	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	
165	Asteraceae	Senecio tamoides (Canary creeper)	3	8	4	V/O	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	
166	Caesalpiniaceae	Senna pendula var. glabrata (Easter cassia)	7	33	4	ST/O	Seedlings: Hand pull	
167	Caesalpiniaceae	Senna septemtrionalis (arsenic bush, was S. floribunda)	6	25	4	S/O	Seedlings: Hand pull	
168	Poaceae	Setaria palmifolia (palm leaf setaria)	5	13	3	H/O	Hand pull or dig up	
169	Poaceae	Setaria sphacelata (South African pigeon grass)	9	41	4	H/A	Hand pull or dig up	
170	Malvaceae	Sida rhombifolia (Paddy`s lucerne)	9	69	4	S/U	Hand pull or dig out.	
171	Asteraceae	Sigesbeckia orientalis (Indian weed)	10	148	4	H/U	Hand pull or cultivation.	
172	Solanaceae	Solanum erianthum (a tobacco bush)	7	19	3	S/O	Hand pull	
173	Solanaceae	Solanum hispidum (giant devil's fig)	5	23	4	S/O	Hand pull	
174	Solanaceae	Solanum mauritianum (wild tobacco tree)	8	30	4	S/O	Seedlings: Hand pull	
175	Solanaceae	Solanum seaforthianum (Brazilian nightshade)	8	78	4	V/O	Hand pull	
176	Solanaceae	Solanum torvum (devil's fig)	6	39	4	S/O	Seedlings: Hand pull	
177	Asteraceae	Solidago canadensis var. scabra (Canadian goldenrod)	7	15	4	H/O	Hand pull and hang to dry.	
178	Bignoniaceae	Spathodea campanulata (African tulip tree)	1	1	3	T/O	N/A	
179	Asteraceae	Sphagneticola trilobata (Singapore daisy)	6	34	5	H/O	Hand pull	
180	Poaceae	Sporobolus africanus (Parramatta grass)	8	48	5	H/U	Hand or mechanical removal of small infestations	
181	Poaceae	Sporobolus fertilis (giant Parramatta grass)	9	27	5	H/U	Hand or mechanical removal of small infestations	
182	Poaceae	Sporobolus pyramidalis and S. natalensis (giant rat's tail grasses)	8	72	5	H/U?	Hand or mechanical removal of small infestations	
183	Poaceae	Stenotaphrum secundatum (buffalo grass)	3	23	3	H/AO	Hand or mechanical removal of small infestations	
184	Fabaceae	Stylosanthes scabra (shrubby stylo)	4	4	4.3	H/A	N/A	
185	Arecaceae	Syagrus romanzoffiana (queen palm)	4	10	4	T/O	Seedlings: Hand pull or crown; Trees: cut below growing point	
186	Asteraceae	Tagetes minuta (stinking roger)	8	32	3	H/U	Hand pull and hang to dry.	
187	Bignoniaceae	Tecoma capensis (Cape honeysuckle)	3	8	4	ST/O	N/A	
188	Bignoniaceae	Tecoma stans (yellow bells)	4	16	4	ST/O	N/A	
189	Poaceae	Themeda quadrivalvis (grader grass)	8	25	4	H/A	Hand pull or dig out small infestations.	
190	Acanthaceae	Thunbergia alata (black eyed susan)	5	22	4	H/O	N/A	
191	Acanthaceae	Thunbergia grandiflora (thunbergia, blue thunbergia)	2	3	5	V/O	N/A	
192	Acanthaceae	Thunbergia laurifolia (laurel clock vine)	1	1	4	V/O	N/A	
193	Fabaceae	Tipuana tipu (tipuana)	2	5	3	T/O	Seedlings: Hand pull	
194	Asteraceae	Tithonia diversifolia (Mexican sunflower)	5	11	4	H/O	N/A	
195	Commelinaceae	Tradescantia fluminensis (Qld use T. albiflora) (wandering jew)	5	9	4	H/O	N/A	
196	Commelinaceae	Tradescantia zebrina (zebrina)	3	12	4	H/O	N/A	
197	Tiliaceae	Triumfetta rhomboidea (Chinese burr)	7	44	4	H/U	Hand pull	
198	Asteraceae	Verbesina encelioides (crownbeard)	7	34	4	H/U	Vines: Hand pull and remove; Runners: Roll up and hang to dry.	
199	Iridaceae	Watsonia meriana var. bulbillifera (bulbil watsonia)	2	3	3	H/O	Dig up, bag and remove	
200	Asteraceae	Zinnia peruviana (wild zinnia)	6	33	3	H/O	Seedlings: Hand pull	

Explanatory notes.

Sub-region (Sr): Number of the ten sub-regions of the Southeast Queensland bioregion (Young and Dillewaard 1999) within which species recorded (Queensland Herbarium data).
Rec no. (R): Total number of records for species within study area, Queensland Herbarium CORVEG and HERBRECS data.
Scores (S): Based on panel data of invasiveness, 5 (highest) to 3 (moderate). ? indicate doubtful scores.

Life forms (LFS): T-tree (woody plant >5m), ST-small tree (2-5m), S-shrub (woody <2m), H-herb (grasses & forbes), Ha-aquatic herbs.
Source: A-agriculture, O-ornamental and landscaping, F-fish aquarium, U-unintentional introduction and/or contaminant.

Abbreviations: Control Methods

CS&P = cut scrape and paint

S&P = scrape and paint

C&P = cut and paint

F/I = frill or inject stem

Abbreviations: Herbicides

G = Glyphosate, eg. Roundup Biactive, Weedmaster Duo

MM = Metsulfuron methyl, eg, Brushoff

F = Fluroxypyr, eg. Starane

Abbreviations: Herbicide Dilution Rates for High Concentration Applications

GU = Glyphosate undiluted

G1 = 1 part water to 1 part glyhphosate

G1.5 = 1.5 parts water to 1 part glyphosate

G4 = 4 parts water to 1 part glyphosate

Abbreviations: Herbicide Spray Concentrations

G100 = 100mL glyphosate per 10L of water + surfuctant, eg 20mL LI 700 per 10L
G200 = 200mL glyphosate per 10L of water + surfuctant, eg 50mL LI 700 per 10L

G100 + MM = 100mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water
G200 + MM = 200mL glyphosate + 1.5g metsulfuron methyl per 10L of water + wetting agent, eg. 2mL Agral per 10L water

MM = 1.5g metsulfuron methyl per 10L water + wetting agent, eg. 2mL Agral per 10L water

F100 = 100mL fluroxypyr per 10L water

F150 = 150mL fluroxypyr per 10L water

Other Abbreviations

= Locally non-indigenous native species

Ref. 1. Big Scrub Rainforest Landcare Group (2008), 'Common Weeds of Subtropical Rainforests of Eastern Australia: A practical manual on their identification and control'

Ref. 2. Department of Primary Industries and Fisheries (QLD), 'Weeds and pest animals and ants'.

Ref. 3. Holland et al. (1996), 'Suburban Weeds', DPI QLD.

Ref 4. Port Stephens Council (NSW), 'Weed Busters'.
Ref 5. Department of Primary Industries (NSW), 'Noxious and Environmental Weed Handbook, 3rd Edition'.
Ref 6. Department of Environment and Conservation, 'Florabase', (DEC- WA)

Ref 7. Vitelli, J.S. and Madigan, B.A. and Van Haaren, P.E. and Setter, S. and Logan, P. (2009) Control of the invasive liana, Hiptage benghalensis. Weed Biology and Management, 9 (1). pp. 54-62.

= Weed Species Recorded on site

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References:

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PROJECT
Rosevale Offset Area 3 –
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DRAWING TITLE
REHABILITATION MANAGEMENT PLAN

DRAWING NO.
7399 E A01_3 Peninsula RMP A

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - APPENDIX 02 *Table of Performance Indicators (i)*

Performance indicator	Method of data collection	Year 1 – Baseline (Month 3)	Year 1 – Month 6	Year 1 – Month 9	Year 1 – Month 12	Year 2a	Year 2b	Year 3a	Year 3b	Year 4a	Year 4b	Year 5a	Year 5b, 6, 7, 8, 9, 10
ENVIRONMENTAL MANAGEMENT ZONE 1. NON-REMNANT PADDOCK VEGETATION RE12.3.3													
1) Native plant species richness – Tree	Sample quadrats (10 * 10 m)	Nil	Nil	Nil	Nil	4	5	5	≥6	≥6	≥6	≥6	≥6
2) Native plant species richness – Shrub	Sample quadrats (10 * 10 m)	1	1	1	1	2	2	4	4	4	4	>4	>4
3) Native plant species richness – Groundcover	Sample quadrats (10 * 10 m)	Nil	2	2	4	6	6	7	7	7	7	>8	>8
4) Number of juvenile stems of eucalypt species	Sample quadrats (10 * 10 m)	≥6	≥6	≥6	≥6	3	3	2	2	2	2	2	2
5) Number of non-juvenile stems of eucalypt species	Sample quadrats (10 * 10 m)	Nil	Nil	Nil	Nil	3	3	5	5	≥6	≥6	≥6	≥6
6) Number of non-juvenile stems of **swift parrot** foraging species (*E. melliodora, E. eugenioides and E. tereticornis*)	Sample quadrats (10 * 10 m)	**Nil**	**Nil**	**Nil**	**Nil**	**2**	**2**	**3**	**3**	**3-4**	**3-4**	**3-4**	**3-4**
7) Number of non-juvenile stems of **regent honeyeater** foraging species (*E. melliodora and E. eugenioides*)	Sample quadrats (10 * 10 m)	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
8) Native plant mortality	Sample quadrats (10 * 10 m) / Photo monitoring	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**
9) WONS weed cover	Sample quadrats (10 * 10 m)	**≥10%**	**≥10%**	**<10%**	**<10%**	**<10%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**
10) Other weed cover	Sample quadrats (10 * 10 m)	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
11) Natural regeneration (yes/no)	Sample quadrats (10 * 10 m) / Photo monitoring	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note:

- *Performance indicator targets represent aspirational targets developed based on the proposed planting palette and densities, BioCondition benchmarks (v3.6) for the relevant regional ecosystems and anticipated response of performance indicators to the proposed rehabilitation regime.*
- *Performance indicator targets in **bold** represent key attributes used for informing adaptive management. For weed management specifically, WONS cover above 5% represents an adaptive action trigger whereas WONS below 1% is the performance indicator target. A plant mortality rate (focusing on tree species) exceeding 10% will trigger adaptive management at all phases of the monitoring until Year 10.*

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - APPENDIX 02 *Table of Performance Indicators (ii)*

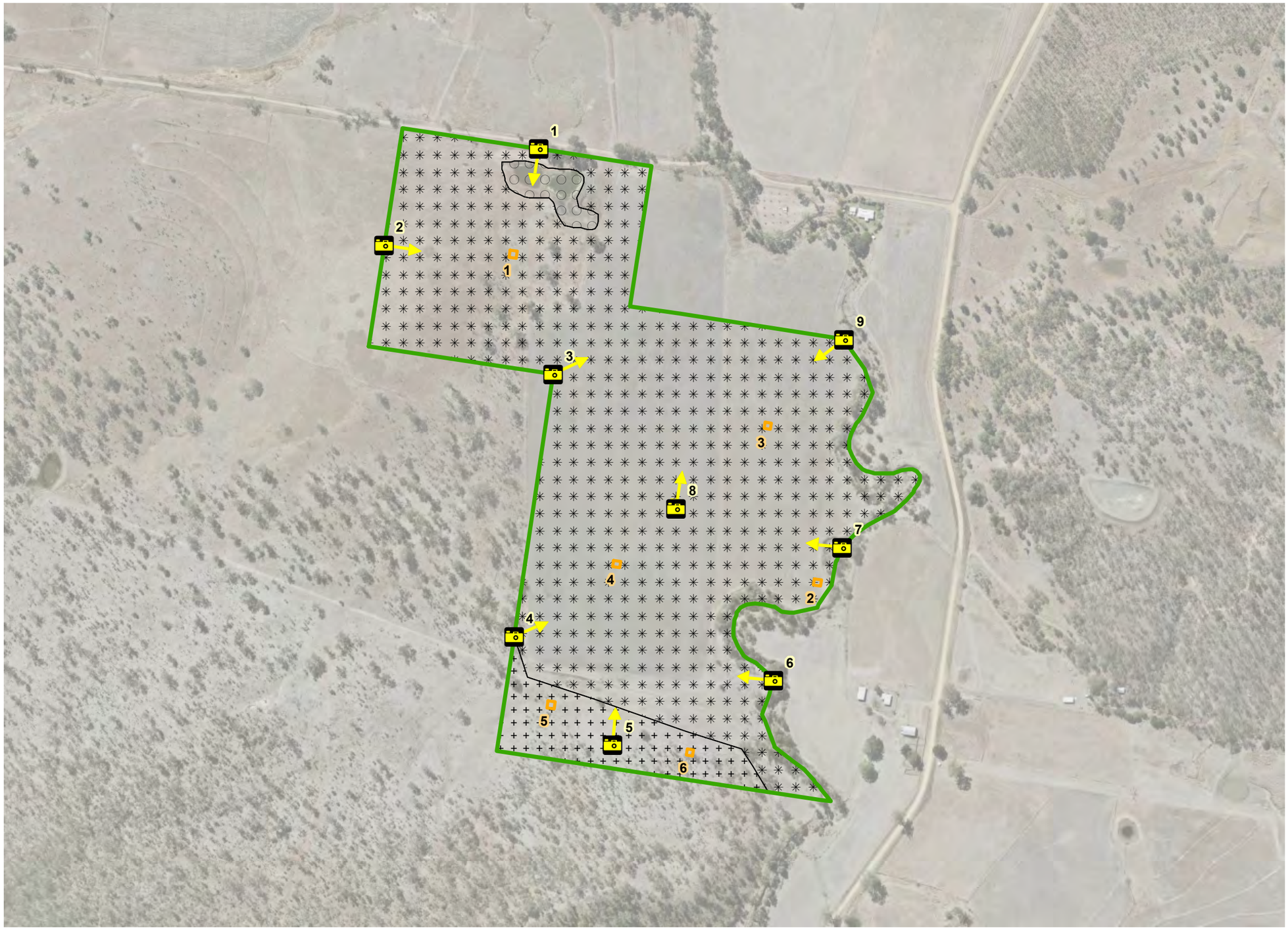
Performance indicator	Method of data collection	Year 1 – Baseline (Month 3)	Year 1 – Month 6	Year 1 – Month 9	Year 1 – Month 12	Year 2a	Year 2b	Year 3a	Year 3b	Year 4a	Year 4b	Year 5a	Year 5b, 6, 7, 8, 9, 10
ENVIRONMENTAL MANAGEMENT ZONE 2. SPARSE REGROWTH VEGETATION RE12.8.17/12.8.14													
1) Native plant species richness – Tree	Sample quadrats (10 * 10 m)	Nil	Nil	Nil	Nil	4	5	5	≥7	≥7	≥7	≥7	≥7
2) Native plant species richness – Shrub	Sample quadrats (10 * 10 m)	1	1	1	1	2	2	4	4	4	4	>4	>4
3) Native plant species richness – Groundcover	Sample quadrats (10 * 10 m)	Nil	2	2	4	6	6	7	7	7	7	>8	>8
4) Number of juvenile and non-juvenile stems of eucalypt species	Sample quadrats (10 * 10 m)	≥6	≥6	≥6	≥6	3	3	2	2	2	2	2	2
5) Number of non-juvenile stems of eucalypt species	Sample quadrats (10 * 10 m)	Nil	Nil	Nil	Nil	3	3	5	5	≥6	≥6	≥6	≥6
6) Number of non-juvenile stems of **swift parrot** foraging species (*E. melliodora, E. eugenioides and E. tereticornis*)	Sample quadrats (10 * 10 m)	**Nil**	**Nil**	**Nil**	**Nil**	**2**	**2**	**3**	**3**	**4-5**	**4-5**	**4-5**	**4-5**
7) Number of non-juvenile stems of **regent honeyeater** foraging species (*E. melliodora and E. eugenioides*)	Sample quadrats (10 * 10 m)	**Nil**	**Nil**	**Nil**	**Nil**	**2**	**2**	**3**	**3**	**4-5**	**4-5**	**4-5**	**4-5**
8) Native plant mortality	Sample quadrats (10 * 10 m) / Photo monitoring	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**	**<10%**
9) WONS weed cover	Sample quadrats (10 * 10 m)	**≥10%**	**≥10%**	**<10%**	**<10%**	**<10%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**	**<1% CA trigger: >5%**
10) Other weed cover	Sample quadrats (10 * 10 m)	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%	<5%
11) Natural regeneration (yes/no)	Sample quadrats (10 * 10 m) / Photo monitoring	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note:

- *Performance indicator targets represent aspirational targets developed based on the proposed planting palette and densities, BioCondition benchmarks (v3.6) for the relevant regional ecosystems and anticipated response of performance indicators to the proposed rehabilitation regime.*
- *Performance indicator targets in **bold** represent key attributes used for informing adaptive management. For weed management specifically, WONS cover above 5% represents an adaptive action trigger whereas WONS below 1% is the performance indicator target. A plant mortality rate (focusing on tree species) exceeding 10% will trigger adaptive management at all phases of the monitoring until Year 10.*

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - *APPENDIX 03. Photo Monitoring Locations (indicative)*



LEGEND

- Environmental Management Zone [413,000 m²]
- Indicative Photo Monitoring Location
- Indicative 10x10m Quadrat Location

Management Zones

- **Environmental Management Zone 1:** Non-remnant Vegetation (RE 12.3.3) [371,390 m ²]
- **Environmental Management Zone 2:** Regrowth Vegetation (RE 12.8.17/12.8.14) [34,155 m ²]
- Waterbodies

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N

SCALE (A3)
1:6,000

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0 25 50 100 150 200 m

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Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - APPENDIX 04 *Photo Monitoring Report (i)*

Photo Monitoring Report

1.1. Project Particulars

Project	
Monitoring Event	
Address	
Client	
Client Contact	
Offset Provider	
Rehabilitation Contractor	
Environmental Coordinator	
Landscape Consultant	

1.2. Indicative Inspection Schedule

Milestone	Timing	Attendees
Baseline		
Year 1 – Q1		
Year 1 – Q2		
Year 1 – Q3		
Year 1 – Q4		
Year 2a		
Year 2b		
Year 3a		
Year 3b		
Year 4a		
Year 4b		
Year 5a		
Year 5b		
Year 6		
Year 7		
Year 8		
Year 9		
Year 10		

1.3. Purpose

The purpose of this Photo Monitoring Report is to provide ongoing monitoring of the rehabilitation works undertaken within the offset area.

Qualitative monitoring and evaluation are a critical component of any restoration project as information gained through these activities can rectify defects before they become large costly problems through the process of adaptive management.

Further, monitoring activities and appropriate documentation provide guidelines for subsequent work conducted in other areas that provide for greater opportunities of success at reduced resource inputs.

This Photo Monitoring Report will be distributed to the rehabilitation contractor to instigate rectification works.

The following details are captured in this report:

- Photo series at each monitoring location.
- Commentary on mortality rate and presence of WONS/other weeds at a minimum with any additional relevant observations to inform adaptive management such as species-specific responses or herbivory.
- Adaptive management (if required).

1.4. Methodology

1.4.1 Photo Monitoring

Photo monitoring will use the following method to ensure adequate data collection and consistency across monitoring events as recommended by the *Guide to photo monitoring of ecological restoration projects* (OEH, 2018):

- Each photo will include the established star picket demarcating the photo point location to create a fixed reference object in the field of view.
- Point the photo towards an established compass bearing (e.g. 55° North) for the photo point location.
- Take multiple photos (left, right, centre) allowing for each image to overlap to create a panoramic view. This will increase the coverage and representativeness of the scene/subject.
- Always take the photo from the same point, and at the same height.
- Use the same camera or the same type of camera each time the photo is taken.
- Minimise sun glare and shadow in the photo and try to take photos at the same time of day.
- Identify key species that will be visible in the photo.
- Take along copies of the original photos for reference when returning to the photo points to help match the field of view contents.

Refer to the following plan indicating the selected photo monitoring locations for the Offset Area (refer **Appendix 01 – Location Plan** in this report).

Permanent photo monitoring points have been established across the offset area as part of the monitoring programme implemented under the Rehabilitation Management Plan (RMP). The series of photos below

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REHABILITATION MANAGEMENT PLAN

DRAWING NO.
7399 E A04_1 Peninsula RMP A

Rosevale Offset Area 3 – Peninsula Precinct (EPBC 2020/8629)

Rehabilitation Management Plan - APPENDIX 04 *Photo Monitoring Report (ii)*

demonstrate the progression of rehabilitation works from baseline (prior to commencement of works) to becoming a self-sustaining ecosystem.

1.4.2 Visual assessment

At each photo monitoring location, a visual assessment will also be completed whereby general observations and commentary relating to the performance indicators detailed in the RMP such as mortality rate, species, weed/WONS presence and other degrading factors are recorded.

After each monitoring event, photos will be transferred to a master photo monitoring data template, designed to show changes in each photo monitoring location between events. Refer to **Appendix 02** in this report for the master photo record.

1.5. Monitoring Form – Photo Point Location 1 (EMZ 1)

Project	
Monitoring Event #	
Date	
Site Inspection Attendees	
Weather Conditions	
Plant Species / Stock	
Plant Mortality	
Weed Management / Presence	
Herbivore damage	
Instability / Erosion Issues	



PHOTO SET. Photo Point Location 1 (Left, Centre, Right)

1.6. Findings and Adaptive Management

[Details on findings of photo monitoring, general observations, issues for rectification and recommendations for adaptive management]

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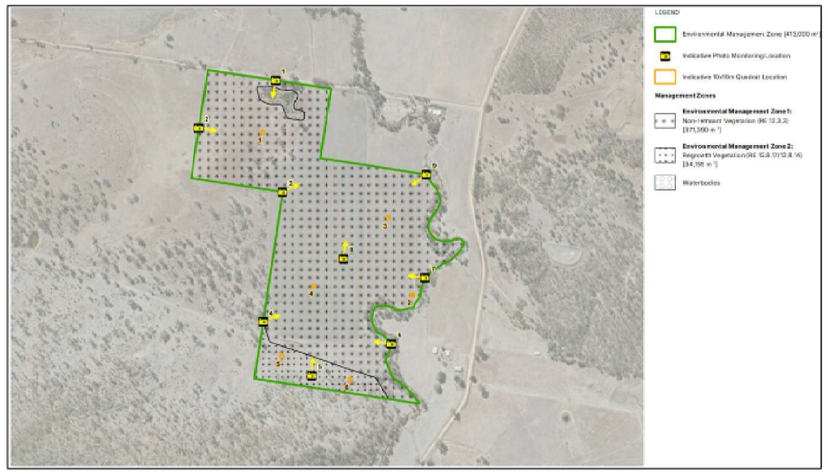
DRAWING TITLE: REHABILITATION MANAGEMENT PLAN

DRAWING NO.: **7399 E A04_2 Peninsula RMP A**

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Rehabilitation Management Plan - APPENDIX 04 *Photo Monitoring Report (iii)*

Appendix 01 – Location Plan



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DRAWING TITLE

REHABILITATION
MANAGEMENT PLAN

DRAWING NO.

7399 E A04_3 Peninsula RMP A

Photo Monitoring Report

Appendix 02 – Master Photo Point Record

Project Ref:
Offset Area:
EPBC Reference:
EMZ:
Photo Point #:
Bearing:
Latitude (decimal degrees):
Longitude (decimal degrees):

Baseline	Year 1 (Q1)	Year 1 (Q2)	Year 1 (Q3)
Date:	**Date:**	**Date:**	**Date:**
Description: Baseline photo prior to commencement of planting works.	**Description:** 3 months after planting works commenced.	**Description:** 6 months after planting works commenced.	**Description:** 9 months after planting works commenced.
LANDSCAPE	LANDSCAPE	LANDSCAPE	LANDSCAPE
Comments:	**Comments:**	**Comments:**	**Comments:**

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MANAGEMENT PLAN

DRAWING NO.
7399 E A04_4 Peninsula RMP A

Explanation of template fields

Field		Description
1	Project Ref	Internal reference number for project record keeping
2	Offset area	Name of the offset area
3	EPBC Reference	Referral number of EPBC project
4	EMZ	Environmental Management Zone within offset area
5	Photo Point #	Each of your photo points are to be given an identification number (e.g. PP1)
6	Bearing	Compass bearing of direction of photo (e.g. 90° North)
7	Latitude / Longitude	Enter data as Decimal Degrees and limit to 4 decimal places. e.g. -33.1234 and 150.1234. (Please do not enter as degrees, minutes, seconds format.)
8	Baseline (before)	This photo should capture pre-work condition of your selected monitoring location. Your baseline photo should be taken during your projects site assessment and planning activities.
9	Date	Enter the exact date the monitoring photo was taken.
10	Description	For each photograph, describe the scene. Include useful information such as targeted weed species and density, regeneration response, significant species, etc.
11	Comments	Where relevant, provide additional higher-level detail for each photo (e.g. unexpected weed responses, problems encountered, etc.)

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References:

South East Queensland Ecological Restoration Framework (2012)

AMENDMENTS

ISSUE	DATE	DESCRIPTION	DRAWN	CHECKED
A	29/10/2025	CLIENT DRAFT	TF	AW

CLIENT
Montauban Environmental Offsets

PROJECT
Rosevale Offset Area 3 –
Peninsula Precinct (EPBC 2020/8629)

DRAWING TITLE
REHABILITATION
MANAGEMENT PLAN

DRAWING NO.
7399 E A04_5 Peninsula RMP A

Attachment A10

Cultural Heritage Conservation Plan

QUEENSLAND GOVERNMENT
Environmental Protection Agency

288 Edward Street • Brisbane, Queensland • PO Box 2771 • BRISBANE GPO QLD 4001 • AUSTRALIA
Telephone (07) 3225 8443 • Facsimile (07) 3225 8723 • www.env.qld.gov.au

Enquiries Robert Neal
Telephone (07) 3225 8426
Your reference
Our reference 961RC256

25 June 1999

Chief Executive Officer
Ipswich City Council
PO Box 191
IPSWICH QLD 4305

Attention Mr Michael McMahon (A/Team Co-ordinator - Springfield)

Dear Mr McMahon

RE: Cultural Heritage Conservation Plan for the Springfield Development

I refer to your letter of 4 June 1999 requesting advice on the cultural heritage assessment and conservation plan for the Springfield Development. The following documents were supplied to this office and have been reviewed to develop an appropriate cultural heritage conservation plan for Springfield.

1. Alfredson, Gillian 1999. A Review of an Aboriginal Cultural Heritage Assessment and Clearance of the Springfield Development, Ipswich, Queensland. Unpublished Report. Chapel Hill: Alfredson Consulting Pty Ltd.
2. Satterthwait, Leonn 1998. An Aboriginal Cultural Heritage Assessment and Clearance of the Springfield Development, Ipswich, Queensland. Unpublished Report. Ipswich: The Ugarapul Tribal Aboriginal Corporation.
3. Correspondence from Dr Leonn Satterthwait, University of Queensland to Keilor Fox and McGhie dated 16 October 1998, 17 August 1998, 2 August 1998, 27 July 1998, 20 July 1998, 12 July 1998, and 5 July 1998,
4. Davies, SJ and A Stewart-Zerba 1994. A Cultural Heritage Assessment of the Proposed Camira Bypass Road and Rail Corridors from Richlands to Keidges Road, Redbank Plains, Moreton Shire, SEQ. St Lucia: UQASU Report No.233
5. Alfredson, Gillian 1991. Report on an Archaeological Inspection of a Proposed Integrated Development at Camira. Unpublished Report. Chapel Hill: Alfredson Consulting Pty Ltd.
6. Springfield Development Control Plan. Ipswich: Ipswich City Council. January 1997.
7. Springfield Master Concept Plan, Keilor Fox and McGhie. January 1999.

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Collectively, the above documentation provides a detailed record of the initiation, conduct, and results of a comprehensive investigation and assessment of the cultural heritage values of the Springfield Development.

Satterthwait (1998) identified 481 artefact find locations giving a find location density of 18 locations per square kilometre. On the basis of artifact density and proximity, Satterthwait identified 32 distinct areas within the Springfield Development area which may be described as archaeological sites. Satterthwait recommended the in situ protection of 63% (N= 20); collection 22% (N= 7); collection/protection for 14% (N=4); and no further action with respect to 3% (N= 1) which was previously disturbed.

Alfredson (1999) provides a peer review of Satterthwait's reports.

The cultural resource management plans developed by Satterthwait (1998) and reviewed by Alfredson (1999) were assessed by the Southern Region Cultural Heritage Program. Field inspection was also undertaken. The appropriate cultural heritage conservation plan for the Springfield Development was determined on these bases.

The thrust of the Environmental Protection Agency's heritage conservation planning in this instance is 'to ensure a good representative sample of the artefacts found on the Springfield Development are retained on-site'.

The following sites are considered to be adequately protected within proposed land allocations of the Master Concept Plan (January 1999): A, B, D, E, G, J, M, Q, U, X, Y, AA, DD, EE, GG.

The above sites are considered to be adequately protected within proposed land allocations of the Master Concept Plan (January 1999). To clarify, the areas of those sites that lie within the 'open space' or 'conservation' allocations as shown in the Master Concept Plan (January 1999) are considered to provide an adequate and appropriate representative sample of the known/identified archaeological heritage resources. The parts of the above sites which occur in zoning's other than 'open space' do not warrant protection or collection and should not pose constraint to development of the local area.

Some sites do not warrant protection or collection and should not pose constraint to development of the local area, as follows: C, F, G, I, K, O, R, S, T, W, Z, BB, CC, FF, and HH.

In some cases the proposed conservation area as shown in the Master Concept Plan is inadequate should be extended to provide additional protection for sites L, N and V.

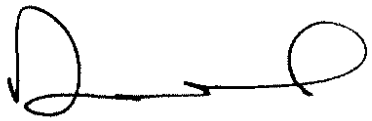
Site P should be systematically collected in accordance with the recommendations of Satterthwait (1998) and Alfredson (1999). The financial responsibilities for this exercise lie with the Springfield Land Corporation.

Site H lies outside the Springfield Development.

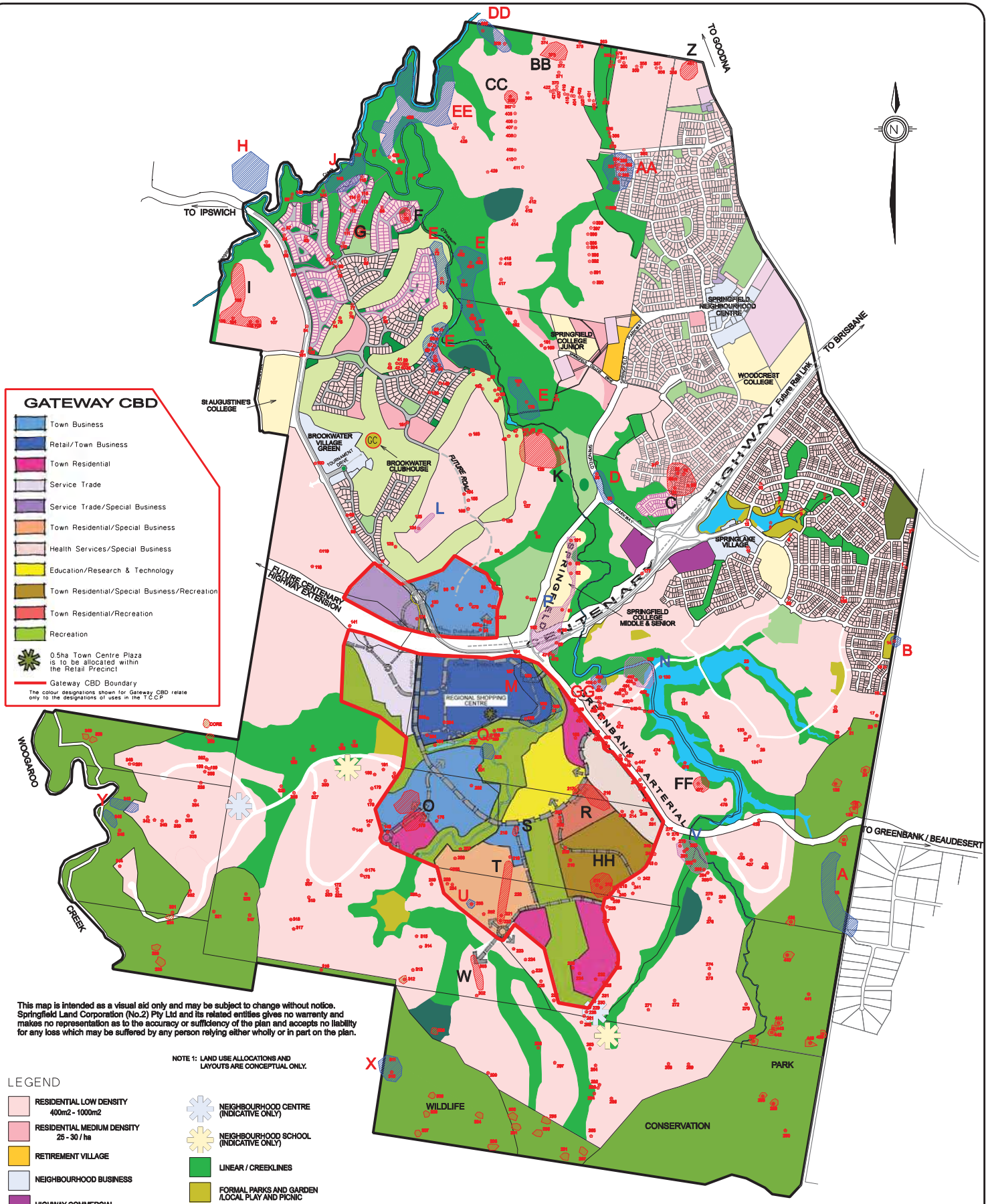
Should any Aboriginal, archaeological or historic sites, item or places may be identified, located or exposed during the course of the development, please cease operations and contact the Regional Manager (Cultural Heritage) on (07) 3225 8443.

The above cultural heritage conservation plan collates and summarises the information previously supplied to Keilor Fox & McGhie in our correspondence dated 1 June 1999, 9 June 1999 and 16 June 1999.

Yours sincerely



Robert Neal
Regional Manager - Cultural Heritage
Southern Region
Environmental Protection Agency



This map is intended as a visual aid only and may be subject to change without notice. Springfield Land Corporation (No.2) Pty Ltd and its related entities gives no warranty and makes no representation as to the accuracy or sufficiency of the plan and accepts no liability for any loss which may be suffered by any person relying either wholly or in part on the plan.

NOTE 1: LAND USE ALLOCATIONS AND LAYOUTS ARE CONCEPTUAL ONLY.

LEGEND

- RESIDENTIAL LOW DENSITY 400m2 - 1000m2
- RESIDENTIAL MEDIUM DENSITY 25 - 30 / ha
- RETIREMENT VILLAGE
- NEIGHBOURHOOD BUSINESS
- HIGHWAY COMMERCIAL
- EDUCATION FACILITY
- COMMUNITY FACILITY
- PUBLIC UTILITIES
- COMMUNITY PARK
- GOLF COURSE
- F Artefact Sites E.P.A. Consider not Requiring Further Protection
- E Artefact Sites E.P.A. Consider Adequately Protected within Public Open Space
- L Artefact Sites E.P.A. Consider Requiring Additional Protection
- NEIGHBOURHOOD CENTRE (INDICATIVE ONLY)
- NEIGHBOURHOOD SCHOOL (INDICATIVE ONLY)
- LINEAR / CREEKLINES
- FORMAL PARKS AND GARDEN /LOCAL PLAY AND PICNIC
- DISTRICT 1 PARK-SPORTS GROUNDS AND COURTS
- DISTRICT 2 PARK
- LAKES
- WETLANDS
- WILDLIFE CONSERVATION PARK
- GC GOLF CLUBHOUSE
- Individual Artifacts
- Y KFM Interpretation of scatters from Satterthwait Report

CONCEPT PLAN CULTURAL HERITAGE ARTIFACTS

JUNE (2004)

Prepared By-

KEILAR FOX McGHIE
SURVEYING • TOWN PLANNING • MAPPING • LAND DEVELOPMENT

SPRINGFIELD LAND CORPORATION

CAD FILE: 02951719 PLAN No: IK 0295-17-062 SCALE 1:12,000 @ A1 (11/10/04)