Ecological Assessment – Matters of National Environmental Significance

EPBC Act Referral – MNES Flora and Fauna

108 Burman Road, Willawong, Queensland 4110

Prepared for Stockland Corporation Limited
17 June 2022

Job 9573 E

saunders havill group

Document Control

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1. Introduction

Saunders Havill Group (SHG) was engaged by Stockland Corporation Limited 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 and communities that may be impacted by the proposed development ('the action') of land located at 108 Burman Road, Willawong, Queensland ('the site').

1.1. Description of the Action

Stockland Corporation Limited ('the Proponent') is proposing to develop industrial allotments on land located at 108 Burman Road, Willawong, described as Lot 1 on RP188299 (refer **Figure 1** and **Figure 2** for site context and aerial imagery). A large portion of the referral in the north and east is to be retained and rehabilitated.

The referral area accounts for a total of 22.27 hectares (ha). The proposed action involves the creation of industrial allotments and internal access roads, and an open space and rehabilitation area in association with the Oxley Creek riparian corridor. Refer to **Figure 3** for the proposed development layout.

1.2. Purpose

This ecological assessment has been prepared to support a referral to the Australian Government's Department of Agriculture, Water and the Environment ('the Department') for assessment against the EPBC Act. The purpose is to:

- Identify biodiversity values within or near the project area including MNES
- Identify potential impacts of the proposed action on MNES
- Present a list of measures to avoid, minimise and / or mitigate the identified impacts; and
- Provide an assessment against the *Significant Impact Guideline 1.1* for MNES identified as having the potential to be impacted by the action, at its broadest scope.

The findings of this assessment will identify if the action will result in a significant residual impact on MNES and determine if it should be made a controlled action.

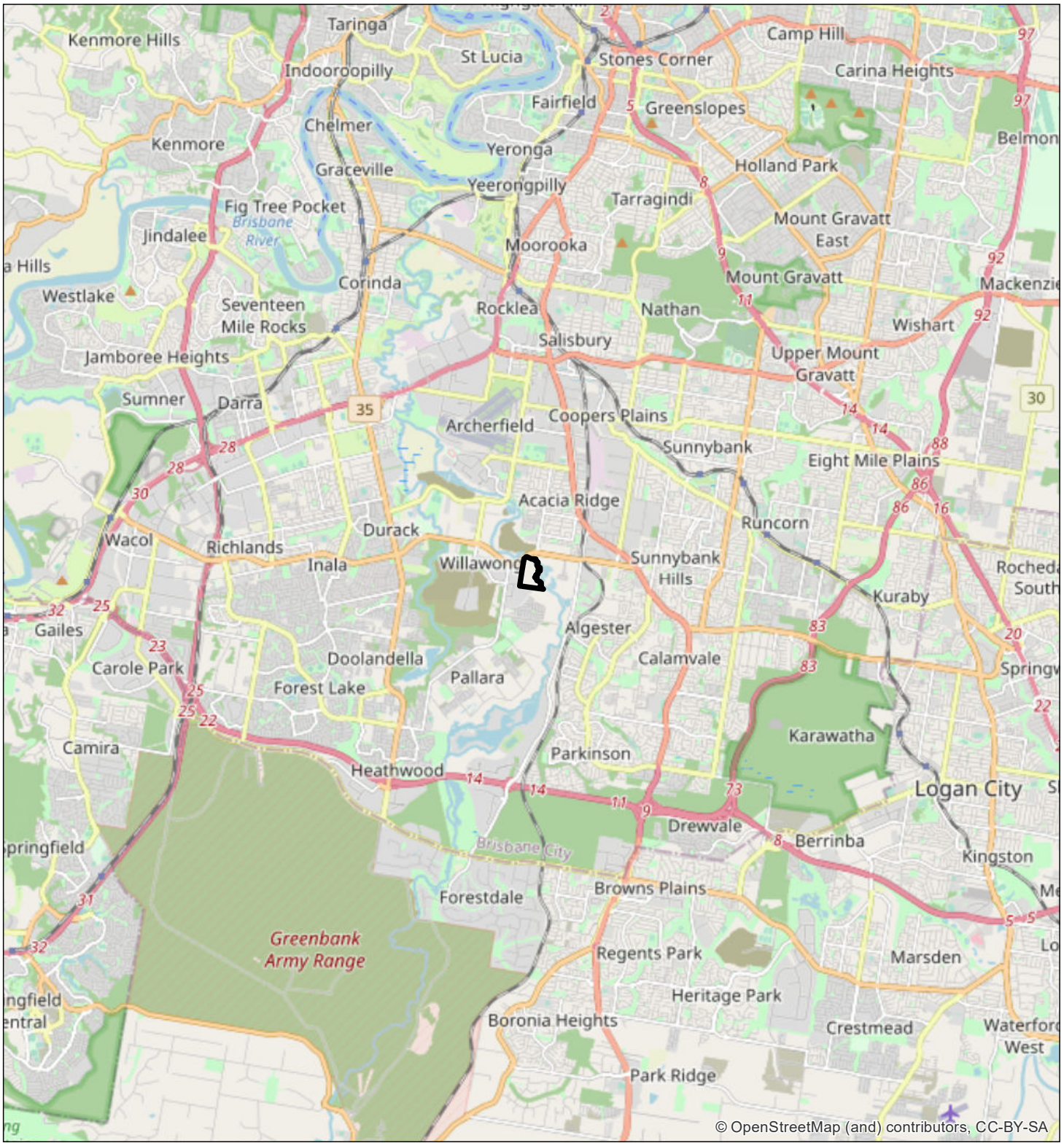
1.3. Areas of Investigation

The areas of investigation for this ecological assessment include:

- Referral area – Lot 1 on RP188299 totalling approximately 22.27 ha.
- Locality – the extent of the 5 km radius database searches of the referral area.

1.4. Site Context

The referral area is located in a highly degraded landscape containing fragmented ecological values as a result of historic and ongoing agricultural land uses and adjacent industrial developments (refer **Plan 1** for fragmentation analysis). The site is bound by Burman Road to the south, Learoyd Road to the north with Oxley Creek running along the eastern boundary. A number of large-scale current and future industrial developments are present within the broader landscape to the west and south.



Legend

Site DCDB

Figure 1

Site Context

File ref. 9573 E Figure 1 Site Context A
Date 27/05/2022
Project 108 Burnman Road, Willawong

0 0.5 1 2 km

Scale (A4): 1:120,000 [GDA 1994 MGA Z56]

N

Stockland

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Layer Source: © State of Queensland 2021

Legend

Site DCDB

Qld DCDB

Figure 2

Site Aerial

File ref. 9573 E Figure 2 Site Aerial A
Date 27/05/2022
Project 108 Burnman Road, Willawong

0 25 50 100 150 m

Scale (A4): 1:4,000 [GDA 1994 MGA Z56]

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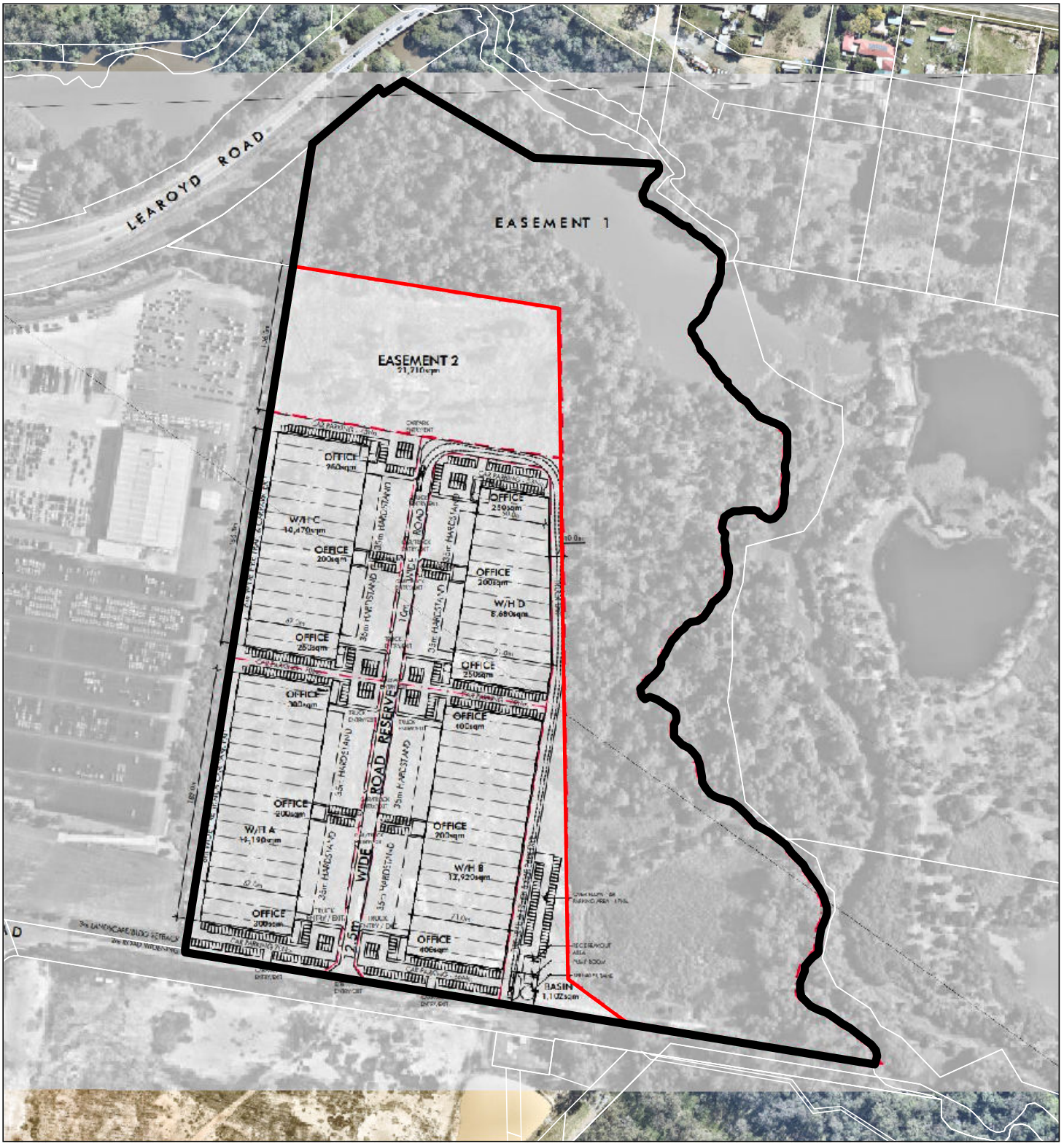

Legend

- Site DCDB
- Qld DCDB
- Development Footprint

Figure 3

Proposed Development

File ref. 9573 E Figure 3 Development A_
Date *16/06/2022*
Project *108 Burnman Road, Willawong*

0 25 50 100 150 *m*

Scale (A4): 1:4,000 [GDA 1994 MGA Z56]

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Layer Source: © State of Queensland 2021,Nearmap 2021

1. Fragmentation 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.

Layer Sources

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

Legend

- Site DCDB
- Vegetation Cover
- Connected Landscape
- Major Roads
- Connectivity via Underpass

Issue	Date	Description	Drawn	Checked
A	27/05/2022	Preliminary	LS	LB

0 400 800 1,200 m

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

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108 Burnman Road, Willawong

Address / RPD: 1RP188299

27/05/2022 | 9573 E 01 Fragmentation A

2. Commonwealth Legislation and Policy

2.1. 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 or not 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.

2.1.1 Significant Impact Guidelines 1.1.

The purpose of these guidelines is to assist any person who proposes to take an action to decide whether or not they should submit a referral to the Department for a decision by the Australian Government Environment Minister (the Minister) on whether assessment and approval is required under the EPBC Act.

2.2. 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. Assessment Methodology and Process

3.1. 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 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 and BioMaps;
- State regulated vegetation management and vegetation supporting maps under the *Vegetation Management Act 1999* (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.

Initial desktop assessment identified five (5) threatened ecological communities (TECs), twenty (20) threatened flora species, twenty-seven (27) threatened fauna species and sixteen (16) migratory species as having the potential to occur within 5 km of the referral area (refer **Appendix A**). An initial assessment for the likelihood of occurrence was undertaken based on desktop survey to inform field survey methodology for target flora and fauna species and communities.

3.2. Field survey methodology

A field survey utilising the methods outlined in the following subsections was conducted to describe ecological value of the referral area. Field surveys were undertaken during seasonal conditions generally favourable to the detection and identification of flora and fauna species. Field survey methods were determined based on target species and communities and EPBC Act listed species guidelines.

Field surveys have been performed on multiple occasions in 2019, 2020 and 2022 with additional targeted MNES flora and fauna surveys undertaken on 5 May 2022 (refer **Table 1**). Field surveys utilising the methods outlined in the following subsections were conducted to describe ecological value of the subject site.

Table 1: Field Survey Methods Summary

Date	Weather Conditions	Methods
11 April 2019	17.8°C min – 26.7°C max, 0 mm rainfall	Vegetation assessments and diurnal searches
18 September 2020	13.5°C min – 27.3°C max, 0 mm rainfall	Vegetation assessments and diurnal searches
7 March 2022	17.9°C min – 31.2°C max, 20.4 mm rainfall	Tree plotting, vegetation mapping and diurnal searches
31 March 2022	19.5°C min – 29.3°C max, 0 mm rainfall	Tree plotting, vegetation mapping and diurnal searches
5 May 2022	15.8°C min – 28.2°C max, 0 mm rainfall recorded	Scat meanders, SAT's, diurnal searches, and spotlighting

Source: Archerfield Airport (040211), BOM 2022

3.2.1 Spot Assessment Technique (SAT) and Koala habitat surveys

Spot Assessment Technique (SAT) surveys were conducted in areas with potential Koala food trees across the site. These were located within more established and less disturbed vegetation with an emphasis on areas containing potential habitat. The aim was to assess Koala usage of the site.

Spot Assessment Technique surveys follow the methodology designed by Phillips and Callaghan (2011). It involves a single ecologist combing the ground under Koala food plant trees (or non-food plant trees if necessary) for a 1-metre radius around the trunk searching for scats. Each tree searched must be greater or equal to 100 mm diameter at breast height (DBH) and search of each tree continues for up to 2 minutes. The search can cease prior to the 2-minute limit if scats are detected. Thirty trees meeting the specifications are analysed during each SAT survey.

Meanders involve walking a winding transect and checking under all trees meeting specifications encountered. Detailed records of each tree are not recorded unless scats are detected. The location of the meander is recorded.

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

The referral area was entirely walked on multiple occasions 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 referral 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.

3.2.3 Scats, tracks and other traces search

Surveys for scats, tracks and other fauna traces were conducted throughout field surveys in 2019, 2020 and 2022. Both predator and non-predator scats were sought during all searches. Specific search efforts were made to locate the presence of Koalas or evidence of their occurrence on the subject lands and the local area. In addition, particular attention

was paid to the identification of potential dens, scats and tracks for invasive species, such as European Red Fox and domestic cats, to identify predator-prey interactions and understand existing impacts within the referral area.

3.2.4 Nocturnal active searches and spotlighting

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

A combination of high-powered spotlights and head torches were used to sample for nocturnal mammals, birds, reptiles and frogs across the proposed action area. This technique involved detecting eye shine, and a record of vegetation density was taken. Additional information recorded included the prevailing conditions and search effort. This method was completed on 5 May 2022.

3.2.5 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.

3.3. 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:

- Australian Government's *Species Profile and Threats Database* (SPRAT) for the threatened species and ecological communities listed under the EPBC Act; and
- Queensland Government's *Department of Environment and Science* (DES) threatened species website.

The likelihood of occurrence assessment was informed by desktop assessment and field survey results, including an appreciation and understanding of the species habitats within the referral area. The assessment adopts a two-tiered approach; the first based on desktop analysis and the potential of occurrence and the second based on a combination of desktop and field survey to determine the likelihood of occurrence.

The likelihood of threatened species and ecological communities occurring in the referral area has been assessed against the criteria outlined in **Table 3**.

Table 2: Likelihood of occurrence assessment criteria

Likelihood of occurrence	Assessment criteria
Unlikely	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; or • Dependent on specific habitat types or resources that are not present on the referral area; or • Considered extinct in the wild.
Low	No previous records of the species within the locality and one or more of the following criteria is met: • Site and local connectivity contains marginal habitat excluding suitable/critical habitat attributes; • Lack of recent records exist in a regional context (use 1980 as a delineation); or

	• Potential for vagrant or individual of the species to survive short-term;
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; • Dependent 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.

3.4. Study Limitations

The ecological assessment involves a combination of desktop assessments and field investigations and has relied on publicly available information and data. The likelihood of occurrence assessment has relied upon 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.

The field surveys 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 utilised a combination of passive and active methods for detection, including spotlighting, SATs, Scat meanders visual identification and inferential evidence of habitat usage (e.g. scratches, scats, burrows, active nests etc). No physical 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.

4. Ecological Assessment Results

4.1. Desktop Assessment

4.1.1 Landscape Context and Historical Aerial Imagery

The referral area is located in a landscape that has been subject to extensive modification for pastoral and agricultural practices resulting in a highly disturbed environment (refer to **Plan 2** for historical aerial imagery analysis). The site has undergone varying levels of historical clearing since the 1940's, with the largest changes occurring within the 1960's. Vehicle tracks and man-made dam features have been added to the site throughout the years with these still present within the referral area. The site has since become increasingly vegetated within the north and east of the site due to a lapse in pastoral maintenance allowing an increase in regrowth vegetation. Further clearing for pastoral efficiencies occurred within the balance area of the site, outside the riparian corridor, leaving the fragmented values currently present on-site.

Connectivity value in the broader landscape is limited by fragmented ecological values including highly trafficked roads, industrial areas and residential developments. However, regrowth vegetation within the northern and eastern extents of the referral area do maintain ecological linkages to the north/north-west and south-east in association with vegetation along Oxley Creek, albeit much of these areas are highly disturbed with weeds and patches of reduced canopy where historic clearing has taken place. Regardless, this vegetation is proposed to be retained and rehabilitated therefore maintaining opportunity for fauna movement further north under Learoyd Road and south into larger areas of intact habitat such as Glider Forest or Karawatha Forest Park.

Connectivity to the west and south of the referral area is limited by large industrial developments which have been almost completely cleared of vegetation. In addition, vegetation in the south-west of the referral area is of relatively low quality, consisting primarily of cleared paddocks with only scattered trees and areas of juvenile regrowth. Therefore, it is considered that the referral area offers no significant ecological linkages in the south-west due to a lack of vegetation both within and neighbouring the referral area.

4.1.2 Matters of National Environmental Significance

Based upon the database searches and the findings of the desktop assessment, 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

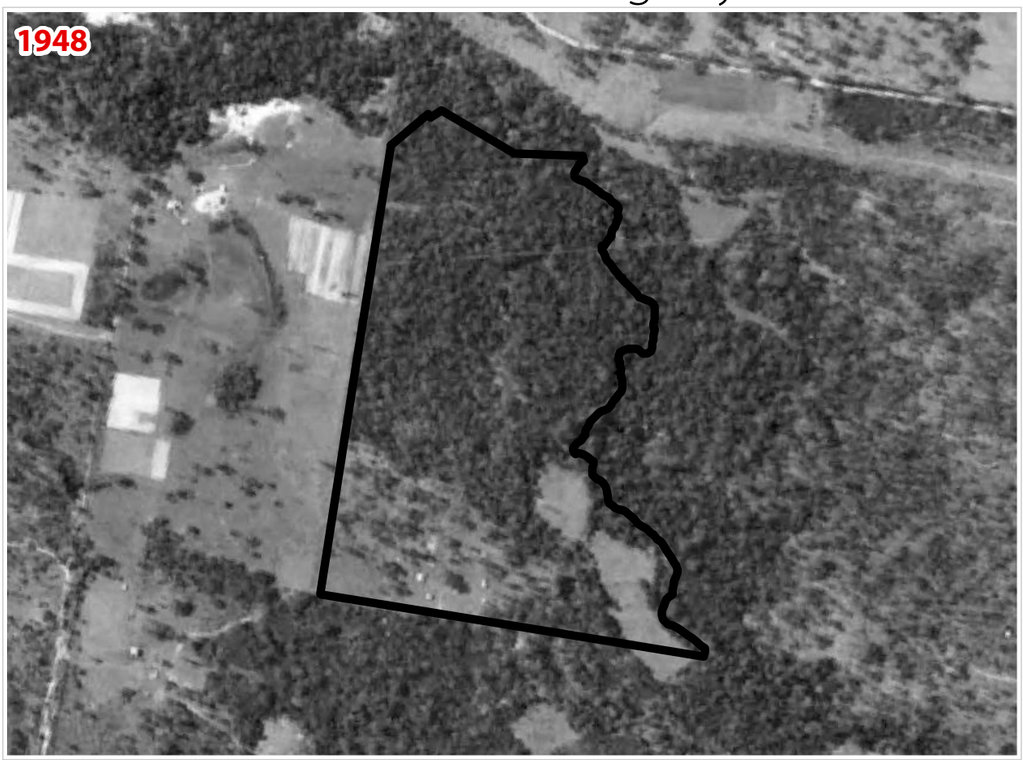
The Protected Matters Search Tool (PMST) (refer **Appendix A)** returned the following five (5) threatened ecological communities (TEC), listed under the EPBC Act as having potential to occur within 5 km of the referral area:

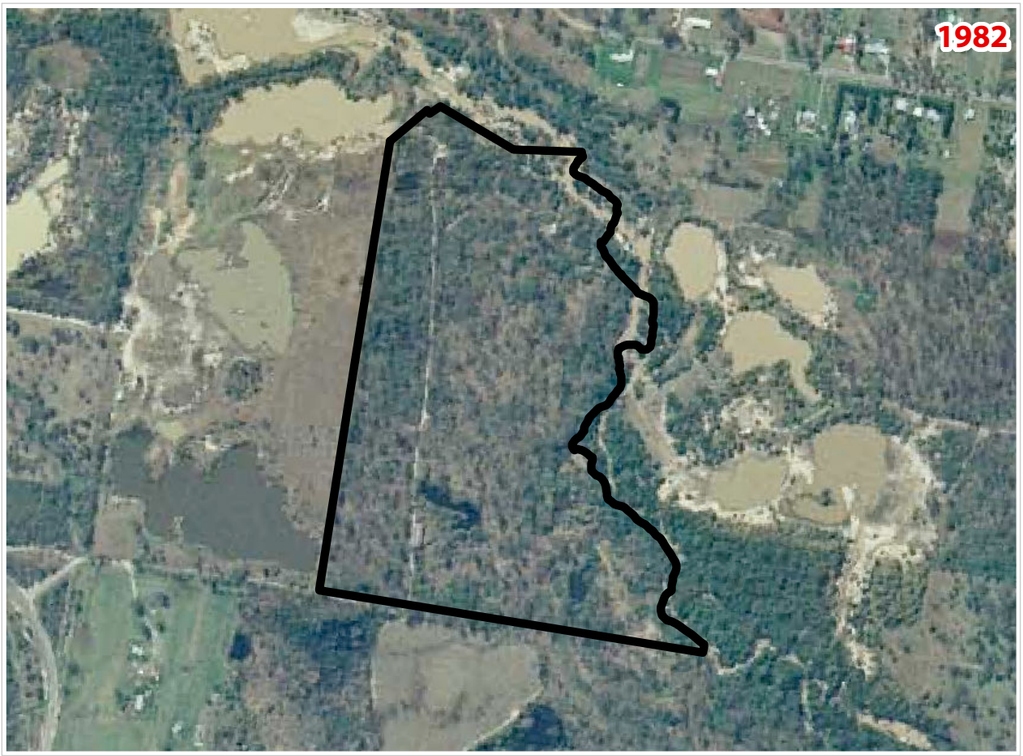
- Coastal Swamp Oak (*Casuarina glauca)* Forest of New South Wales and South East Queensland ecological community
- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland
- Lowland Rainforest of Subtropical Australia
- Poplar Box Grassy Woodland on Alluvial Plains
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

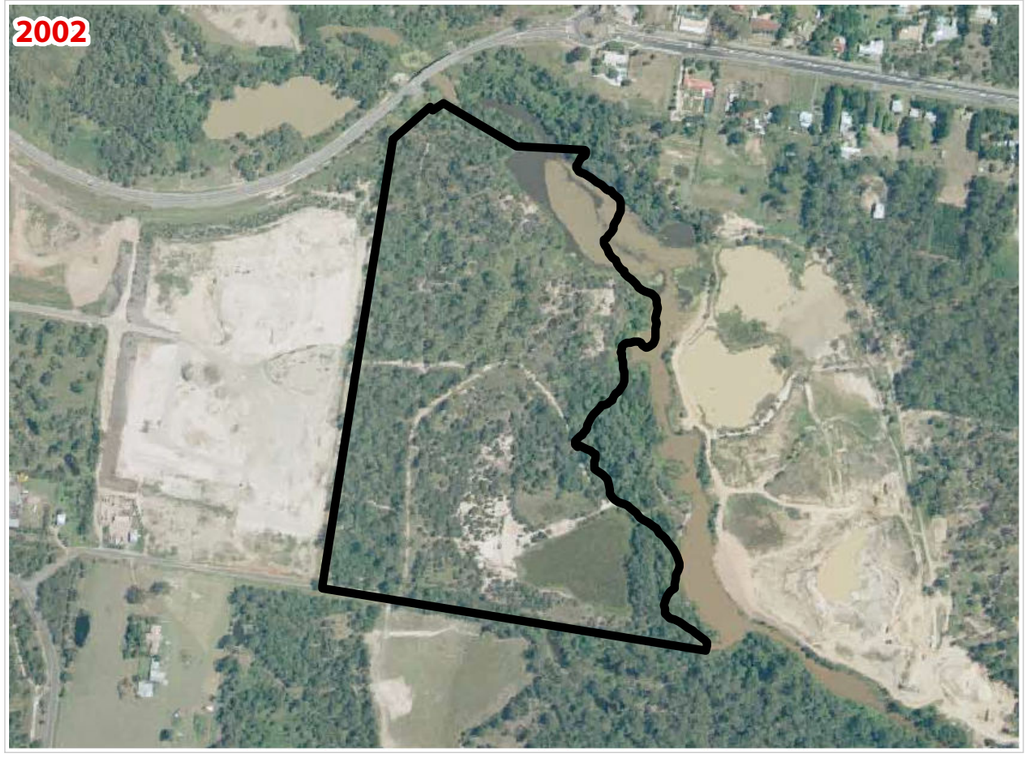
The likelihood of occurrence for each TEC within the referral area, as presented in **Table 4**, referred to State Government Regional Ecosystem mapping within the locality and known distributions of the TECs, to identify those TECs with

potential to occur in the referral area or recorded during field surveys. All TECs were identified as having low potential to occur based on site characteristics and vegetation mapping.

2. Historical Aerial Imagery







Notes:
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Layer Sources

Legend

Site DCDB

Issue	Date	Description	Drawn	Checked
A	27/05/2022	Preliminary	LS	LB

0 50 100 150 m

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

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Stockland

Address / RPD: 1RP188299

108 Burnman Road, Willawong

27/05/2022 | 9573 E 02 Historical A

Table 3: Likelihood of occurrence of TECs within referral area

TEC	EPBC Act status	Desktop Potential of Occurrence
Coastal Swamp Oak (*Casuarina glauca)* Forest of New South Wales and South East Queensland ecological community	Endangered	**Low** The site is not mapped as containing any regional ecosystems associated with this threatened ecological community.
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	**Low** The site is not mapped as containing any regional ecosystems associated with this threatened ecological community.
Lowland Rainforest of Subtropical Australia	Critically Endangered	**Low** The site is not mapped as containing any regional ecosystems associated with this threatened ecological community.
Poplar Box Grassy Woodland on Alluvial Plains	Critically Endangered	**Low** The site is not mapped as containing any regional ecosystems associated with this threatened ecological community.
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	**Low** The site is not mapped as containing any regional ecosystems associated with this threatened ecological community.

4.1.4 Threatened Flora Species

Database searches returned twenty (20) flora species, listed as threatened under the EPBC Act and/or NCA, as having being previously recorded or predicted to occur within 5 km of the referral area, as presented in **Appendix A** and **Appendix B.**

Based on the presence of species records within the locality and the habitats within the referral area, an assessment was conducted to determine those threatened flora species with potential to occur within the referral area. The desktop assessment identified that one (1) threatened flora species had a 'moderate' potential to occur on the referral area (refer **Table 4**). All other threatened flora species were assessed as having a low potential to occur.

Table 4: Likelihood of occurrence of flora species within referral area

Scientific Name	EPBC Act	NC Act	Desktop Potential of Occurrence
Maundia triglochinoides	-	Vulnerable	**Moderate** While the majority of the referral area likely does not provide habitat know to support this species. Oxley Creek adjacent to the eastern boundary of the site may provide potential habitat. According to Queensland Wildnet, three (3) observations of this species are recorded within 5 km of this site. Biomaps indicates that two (2) of these are from 2014, 3km south of the site in Kayannie St Environmental Habitat. As Oxley Creek is in close proximity to the referral area, the likelihood of occurrence for this species has been assigned 'moderate.'

The detailed likelihood of occurrence assessment is presented in **Appendix C**.

4.1.5 Threatened Fauna Species

Database searches returned twenty-seven (27) fauna species listened as threatened under the EPBC Act and/or NCA 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 mapped habitats identified within the referral area, a likelihood of occurrence assessment was conducted to determine those threatened species with potential to occur within the assessment area. This assessment determined six (6) threatened fauna species listed under the EPBC Act and/or NCA as having 'moderate' or higher potential to occur on or near the referral area. These species are outlined in **Table 5** below. All other threatened and/or migratory fauna species were assessed as having a 'low' potential to occur.

Table 5: Likelihood of occurrence of fauna species within referral area

Scientific Name	EPBC Act	NC Act	Desktop Potential of Occurrence
Anthochaera Phrygia (Regent Honeyeater)	Critically Endangered	Endangered	**Moderate** The referral area is mapped as containing entirely Category X (non-remnant) vegetation under the Queensland *Vegetation Management Act 1999* as a result of an approved PMAV(ref: 2006/003251). Areas of Category B (remnant) and Category C (regrowth) vegetation are present along the adjacent eastern border in association with the Oxley Creek Corridor. The site itself is largely cleared as a result of historical modification with exception to the immature woodland area within the north and east of the site. There is only one (1) confirmed record of the Regent Honeyeater in 2020 located in the broader Willawong locality according to Atlas of Living Australia (ALA). However, Queensland Wildnet does not record any sightings of this species within 5 km of the site. Regardless of limited records of this species in the area, suitable habitat in the form of Eucalypt Woodland is likely present within the referral area, therefore the likelihood of the species to utilise the site opportunistically or as fly-over has been assigned 'moderate.'
Hirundapus caudacutus (White-throated Needletail)	Vulnerable	-	**Moderate** The referral area contains wooded areas including open forests and clearings. According to Queensland Wildnet and ALA there are three (3) records of this species within 5km radius of the site. However, a review of these records indicate that a higher number of sightings have been recorded 5.7km west within Karawatha Forest Park, an area which provides more suitable roosting and/or foraging habitat due to containing mature intact bushland. As the species has been recorded over a variety of habitat types the likelihood of the species to utilise the site or as fly-over has been assigned 'moderate.'
Ninox strenua (Powerful Owl)	-	Vulnerable	**Moderate** This species has been recorded within a variety of habitat types including open forests and woodlands, as well as along sheltered gullies in wet forests with dense understoreys, especially along watercourses. Records from Queensland Wildnet indicate four (4) sightings of the species within 5 kms

Scientific Name	EPBC Act	NC Act	Desktop Potential of Occurrence
			of the site. The most recent of these records is from 2020 within bushland associated with Blunder Creek 2 km west of the site. As the species has been observed over a variety of habitat types as well as several records in the broader area, the likelihood of occurrence has been assigned 'moderate.'
Turnix melanogaster (Black-breasted Button Quail)	Vulnerable	Vulnerable	**Moderate** The referral area is mapped as Category X (non-remnant) vegetation as the result of an approved PMAV. Pre-clear mapping of the are indicates RE12.3.11 across the majority of the referral area. This RE is listed as containing habitat that may be suitable for Black-breasted Button Quail. Queensland Wildnet, ALA and Biomaps have not record sightings of this species within 5 km of the site. However, as suitable habitat may occur, likelihood of occurrence has been assigned to 'moderate.'
Phascolarctos cinereus (Koala)	Endangered	Endangered	**Moderate** The referral area is mapped as Category X (non-remnant) vegetation as the result of an approved PMAV. Pre-clear mapping of the area indicates RE12.3.11 across the majority of the referral area. Regional ecosystem 12.3.11 is comprised of species known as Koala habitat trees such as *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus siderophloia* (Grey Ironbark). According to Queensland Wildnet Data, which dates back to the 1980s, thirty (30) Koalas have been recorded within a 5 km radius of the site. However, a review of ALA and Biomaps indicated that the majority of these records are over 25 years old. The closest recorded sighting of Koala to the referral area is from 2013 in a small patch of trees adjacent Compton Road 3.5 km east of the site, separated by residential areas, industry and highly traversed roads. More recent records of Koala (within 5 years) are located in Toohey Forest Conservation Park 5.8 km north of the site and vegetation surrounding Scrubby Creek 7.8km south-east of the site. As the species is known to occur within the broader landscape as well as the presence of potential habitat within the referral area, the likelihood of occurrence has been assigned 'moderate.'
Pteropus poliocephalus (Grey-headed Flying-fox)	Vulnerable	-	**Moderate** The referral area is mapped as Category X (non-remnant) vegetation as the result of an approved PMAV. Pre-clear mapping of the area indicates RE12.3.11 across the majority of the referral area. RE12.3.11 indicates potential foraging habitat may be present within the referral area. The nearest roost is located 3.4 km south-east of the site in Parkinson, Avondale Crescent (419), however recent surveys in 2020 found no flying-foxes at the camp, with numbers dwindling in the previous 2018 survey. The nearest active camp, with Grey Headed Flying Foxes recorded as of 2022, is located 13.2 km west of the site in association with Goodna Creek in Redbank (428). As the species is known to forage in a variety of habitats, including open

Scientific Name	EPBC Act	NC Act	Desktop Potential of Occurrence
			woodland areas present on-site, a desktop assessment of the likelihood of occurrence has been assigned 'moderate.'

The detailed likelihood of occurrence assessment is presented in **Appendix C**.

4.1.6 Migratory Species

Database searches returned sixteen (16) migratory fauna species listened as threatened under the EPBC Act and/or NCA 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, an assessment was conducted to determine those threatened species with potential to occur within the referral area. The assessment determined that no threatened migratory fauna species listed under the EPBC Act and/or NCA were identified as having moderate or greater potential to occur in the referral area. All migratory fauna species were assessed as having a low potential to occur.

The detailed likelihood of occurrence assessment is presented in **Appendix C**.

4.1.7 State Mapped Vegetation

A desktop review of the Queensland 'Regulated Vegetation Management Mapping' under the *Vegetation Management Act 1999* (VMA) was conducted, focusing on the referral area. The site consists entirely of Category X (non-remnant) vegetation through a Property Map of Assessable Vegetation (PMAV) (ref: 2006/003251). Refer **Figure 4** for PMAV Map. Pre-clear Regional Ecosystem mapping indicates the site was historically comprised predominantly Of Concern RE12.3.11 and smaller sections of Least Concern RE12.3.7.

Legend

- Site DCDB
- Qld DCDB

PMAV Category

- Category X

Regional Ecosystems mapping

- 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

Property Maps
Assessable Vegetation

File ref. 9573 E Figure 4 PMAV A
Date 13/06/2022
Project *108 Burnman Road, Willawong*

0 40 80 120 160 m

N

Scale (A4): *1:4,000* *[GDA 1994 MGA Z56]*

Stockland

saunders havill group

Layer Source: *© State of Queensland 2022, Metromap 2022.*

4.2. Field Surveys

The results of the flora and fauna surveys, and the potential of occurrence, enables an understanding of the ecological constraints and potential impacts to MNES associated with the Project.

The results of the targeted vegetation, flora and fauna surveys is presented within the following sections. Refer to **Plan 3** 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 been subject to rapid landscape changes for industry and overall urbanisation within the past 10 years (refer **Plan 2**). The referral area has been subject to historical clearing for agricultural activities resulting in cleared paddocks with scattered trees and juvenile regrowth in the south-west. Vegetation in the north and east contains a more intact canopy, however, aerial imagery and site surveys indicate this vegetation has also been disturbed by historical land-uses, thus resulting in dense weeds, juvenile regrowth values and reduced canopy coverage in some areas. Connectivity value within the referral area is compromised in the south-west extent, where vegetation on-site is of relativity low value and limited to scattered trees. In addition, neighbouring properties to the west and south have been almost completely cleared to facilitate large industrial developments, with the remaining vegetation along the western neighbouring boundary dominated by invasive ground and shrub cover. Ecological linkages are therefore confined to the northern and eastern extent of the referral area where higher quality vegetation adjoins Oxley Creek which runs north to south to larger areas of relatively intact vegetation.

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 five (5) 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
- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland
- 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 potential of occurrence for each TEC within the referral area, as presented in **Appendix C**, 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 in or adjoining 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 within the referral area.

As the entire referral area is mapped as Category X (non-remnant) vegetation as a result of an approved PMAV (ref:2006/003251), on-ground vegetation characteristics were utilised to delineate vegetation communities. Field surveys identified five (5) vegetation communities within the referral area (refer **Plan 4**).

1. Higher Quality Koala Habitat
2. Disturbed Koala Habitat
3. Fragmented Ancillary Koala Habitat
4. Fragmented Paddock
5. Dams and Waterbodies

The site is mapped as Category X (non-remnant) vegetation under the PMAV. The site is confirmed to be mostly cleared with scattered trees and regrowth eucalypt woodland. Pre-clear RE mapping indicates the site was historically comprised of predominantly Of Concern RE12.3.11 as well as Least Concern RE12.3.7 associated with Oxley Creek to the east, described below:

- RE12.3.11: *Eucalyptus tereticornis +/- E. siderophloia and Corymbia intermedia open forest to woodland. Corymbia tessellaris, Lophostemon suaveolens and Melaleuca quinquenervia frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include Angophora leiocarpa, E. exserta, E. grandis, E. latisinensis, E. tindaliae, E. racemosa and Melaleuca sieberi. Corymbia trachyphloia and/or C. citriodora subsp. Variegata may dominate on areas of Pleistocene alluvia. Eucalyptus seeana may be present south of Landsborough and Livistona decora may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c)*
- RE12.3.7: *Narrow fringing woodland of Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca viminalis. Other species associated with this RE include Melaleuca bracteata, M. trichostachya, M. linariifolia. North of Brisbane Waterhousea floribunda commonly occurs and may at times dominate this RE . Melaleuca fluviatilis occurs in this RE in the north of the bioregion. Lomandra hystrix often present in stream beds. Occurs on fringing levees and banks of rivers and drainage lines of alluvial plains throughout the region. (BVG1M: 16a)*

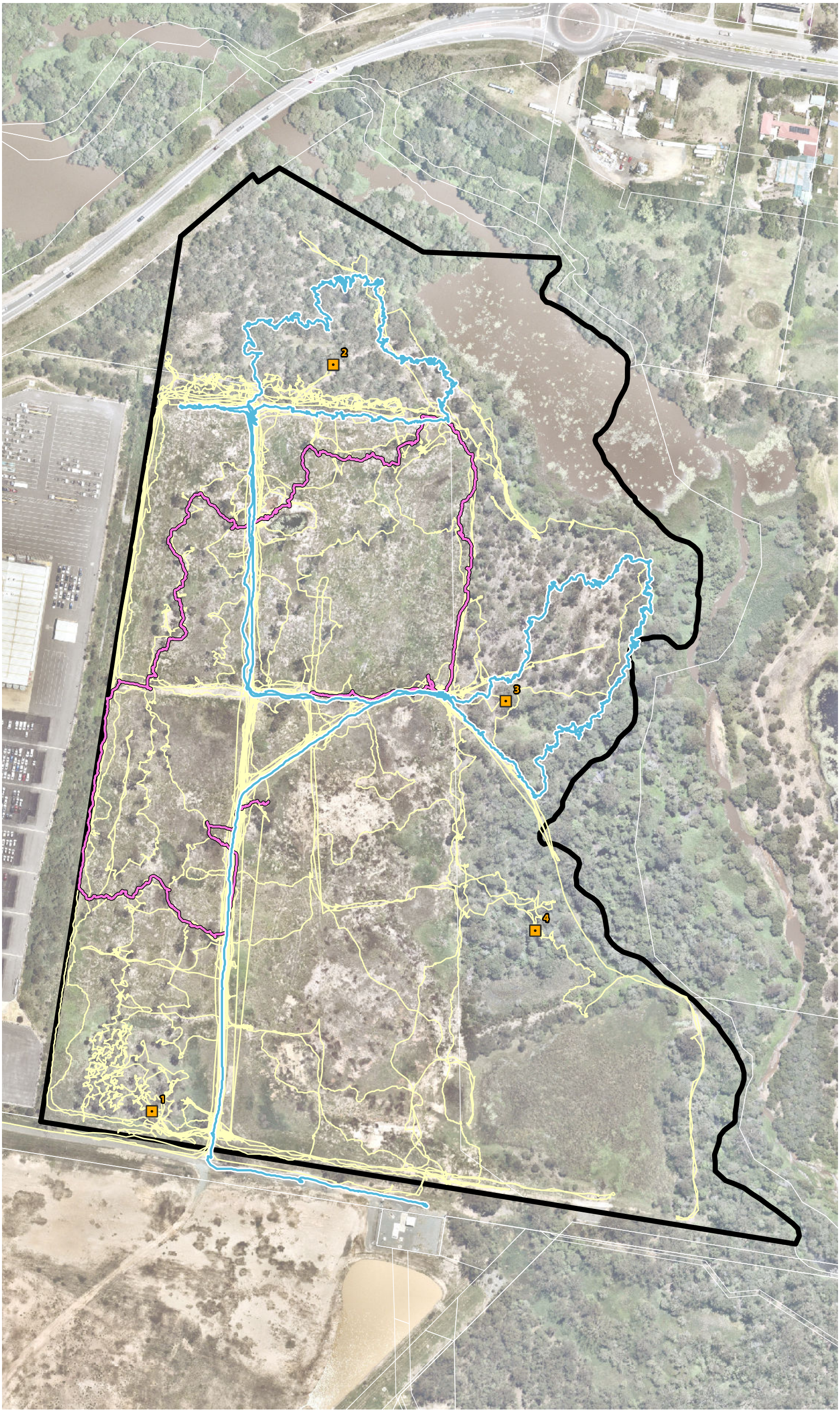
Vegetation across the referral area where present is generally consistent with pre-clear RE mapping 12.3.11 consisting of *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus siderophloia* (Grey Ironbark), *Corymbia intermedia* (Pink Bloodwood) and *Melaleuca quinquenervia* (Broad-leaved Paperbark). The northern and eastern extent of the referral area consists of relatively intact vegetation with a treed canopy, however, areas of this reflect regrowth vegetation with only scattered large trees. Due to historical land-uses, weeds are present throughout the ground and shrub layer within the northern and eastern extent of the referral area, specifically *Lantana camara* (Lantana) and *Sphagneticola trilobata* (Singapore Daisy), (refer **Photo set 1**). Following field surveys, vegetation within this area has been classified as 'Higher Quality Koala Habitat.' Where disturbance related to more recent clearing has resulted in reduced tree density and canopy, these areas have been classified as 'Disturbed Koala Habitat' (refer **Plan 4**).

Land in the south-west portion of the referral area has been subject to more recent and on-going modification resulting in a largely cleared area consisting of scattered trees, juvenile regrowth and exotic grasses. Generally, the western extent of this area maintains a higher density of canopy trees relative to the cleared paddocks, especially along the western property boundary and including a low-lying Melaleuca stand in the very south-west. Therefore, this area has been classified as 'Fragment Ancillary Koala Habitat' while areas devoid of canopy trees with only juvenile regrowth present has been classified as 'Fragment Paddock' (refer **Photo set 2** and **Plan 4**). Several constructed dams are present across the referral area as well as a large water body in the north-east associated with Oxley Creek (refer **Photo set 3**).

A number of waterways are mapped across the referral area. The south-west corner of the referral area was formerly fed by overland flow from adjacent areas south of the site but has since apparently been cut off by development.

Furthermore, a large dam feature in the south-east of the site is fed by drainage channels from the south. Field surveys indicated this dam as being overrun with vegetation including exotic macrophytes, primarily *Typha orientalis*. In addition, waterway mapping for Oxley Creek has been assessed as being highly inaccurate. State mapping indicates this waterway as running through the southern centre of the site, however these values are absent with aerial imagery and field surveys identified Oxley Creek as running adjacent to the eastern boundary of the referral area.

3. Field Survey Effort



Notes:
This plan was prepared as a desktop assessment tool. The information on this plan is not suitable for any other purpose. Property dimensions, areas, numbers of lots and contours and other physical features shown have been compiled from existing information and may not have been verified by field survey. These may need verification if the development application is approved and development proceeds, and may change when a full survey is undertaken or in order to comply with development approval conditions. No reliance should be placed on the information on this plan for detailed design or for any financial dealings involving the land. Saunders Havill 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.

Legend

- Qld DCDB
- Site DCDB
- Development Footprint
- Scat Meander
- Spotlighting
- GPS Track Log
- SAT survey

Issue	Date	Description	Drawn	Checked
A	27/05/2022	Preliminary	LS	LB

0 20 40 60 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:2,500 @ A3

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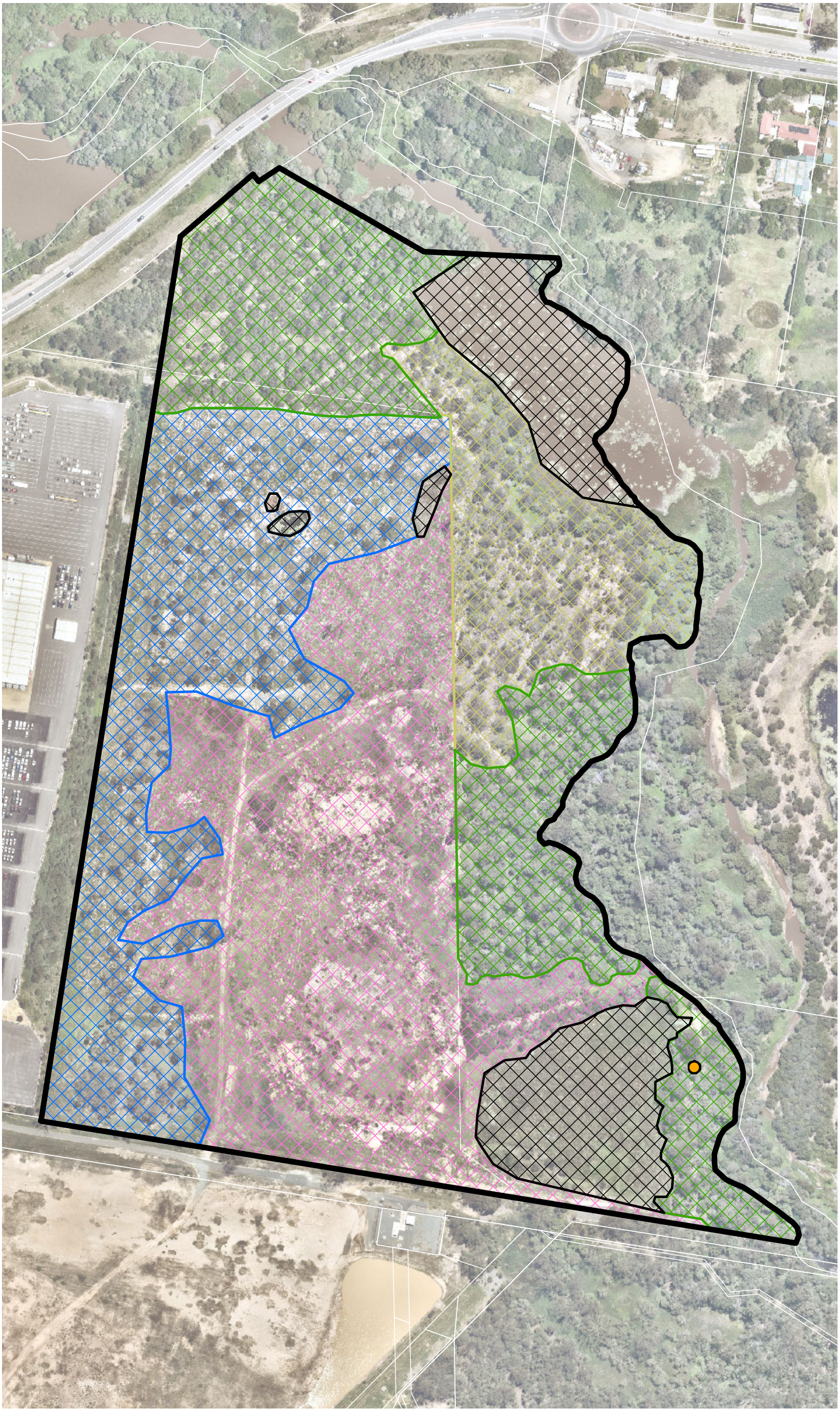
108 Burnman Road, Willawong

Address / RPD: 1RP188299

27/05/2022 | 9573 E 03 Field Survey A

4. Vegetation Communities



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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Updated data available at
http://qldspatial.information.qld.gov.au/catalogue/
© Nearmap, 2022

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Legend

- Qld DCDB
- Site DCDB - 22.27ha
- 1 - Higher Quality Koala Habitat - 4.68 ha
- 2 - Disturbed Koala Habitat - 2.53 ha
- 3 - Fragmented Ancillary Koala Habitat - 5.04 ha
- 4 - Dams/Waterbodies - 2.58 ha
- 5 - Fragmented Paddock - 7.44 ha
- Observation Point

Issue	Date	Description	Drawn	Checked
A	13/06/2022	Preliminary	LS	LB

0 20 40 60 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:2,500 @ A3

saunders havill group

Stockland

108 Burnman Road, Willawong

Address / RPD: 1RP188299

13/06/2022 | 9573 E 04 Vegetation Communities A

Photo set 1: Vegetation in the north and east identified as 'High-value Koala Habitat' (top) and 'Disturbed Koala Habitat' (bottom).

Photo set 2: Highly disturbed vegetation in the south-west of the referral area. 'Fragmented Ancillary Koala Habitat' (top) and 'Fragmented Paddock' (bottom).

Photo set 3: Constructed dams across the referral area.

4.2.4 Connectivity

The referral area contains fragmented ecological values due to surrounding industrial and residential land-uses and on-site land maintenance and clearing. Most notably, the south-west extent of the site contains relatively low habitat value in the form of paddocks and only scattered trees which are isolated from areas of intact bushland due neighbouring industrial developments to the south and west. Notably, the referral area does retain current ecological linkages to the north and east where higher quality habitat on-site adjoins Oxley Creek. Vegetation in association with this waterway extends north and south-east forming potential linkages to larger areas of vegetation cover south of the site (refer **Plan 1**). In addition, vegetation associated with Oxley Creek aligns with mapping of a Queensland Riparian Biodiversity Corridor reflected in Brisbane City Council mapping where vegetation to the north and south-east of the referral area is zoned as 'Conservation' and 'Environmental Management.' The regrowth vegetation in the north and east of the referral area is intended to be retained and rehabilitated, therefore maintaining these local linkages in a rapidly urbanising environment.

Refer to **Plan 1** for the fragmentation analysis.

4.2.5 Spotlight Searches

Spotlighting occurred on the 5 May 2022 between 1730hrs and 2030hrs. Spotlighting effort focussed on areas identified as potential habitat for nocturnal species (e.g. more mature trees) and targeted searches for Koala. The majority of the site was assessed and all species found were recorded.

4.2.6 SAT Surveys

Four (4) SAT surveys to assess Koala activity within the referral area were completed in accordance with Philips and Callaghan (2011) as well as a scat meander throughout the impact area (Refer to **Plan 3** for locations). All SAT surveys scored a 0 out of 30 (refer to **Appendix E** for full SAT results). No evidence of Koala in the form of direct sightings or scats and scratch marks was detected within the referral area during these targeted surveys nor via incidental searches during tree plot or habitat surveys.

4.2.7 Flora Results

A total of one-hundred and thirteen (113) flora species were recorded within the vegetation communities within the referral area during field surveys, as listed in **Appendix D.** Of the one-hundred and thirteen (113) flora species recorded, sixty-eight (68) are native and forty-five (45) species are considered to be non-native / introduced species.

Refer to **Appendix D** for the complete flora list and native / non-native designation.

No flora species listed under the EPBC Act nor NCA were recorded in or adjoining the referral area.

4.2.8 Fauna Results

A total of thirty-two (32) fauna species were recorded during field surveys, including twenty-three (23) birds, four (4) reptiles, three (3) amphibians and two (2) mammals. No conservation significant fauna species or evidence of their activity were recorded during the field survey.

A complete fauna species list is provided in **Appendix D.**

4.2.9 Threatened Fauna Assessment

Database searches returned twenty-seven (27) fauna species listened as threatened under the EPBC Act and/or NCA as having been previously recorded or predicted to occur within 5 km of the referral area. The desktop assessment determined six (6) threatened fauna species listed under the EPBC Act and/or NCA as having moderate or higher potential to occur on or near the referral area. A summary of targeted field assessments is found below.

Koala (*Phascolarctos cinereus*)

The Koala occurs in a range of environments containing eucalypt forest or woodland. While the referral area does support potential habitat for the species, on-ground assessments delineated vegetation communities into low-value habitat in the form of fragmented Koala habitat and cleared open paddocks in the south-west. Higher quality habitat is present in the northern and eastern portions of the referral area where a greater diversity and density of Koala trees is present. Nocturnal surveys (spotlighting) and Scat meander surveys were utilised to detect evidence of Koala activity across the referral area and to determine the likelihood of occurrence on-site. Scat meander is a technique involving walking a winding transect and searching the base of Koala food trees for Koala scats, the trunk for scratch marks and the crown of the tree for Koala specimens. In addition, four (4) Spot Assessment Techniques (SAT's) were carried out across the referral which involves searching the base of the nearest 30 trees to a central point for scats. No evidence of Koala activity in the form of scats, scratch marks and direct observations were recorded within the referral area. The evidence suggests that the referral area is not currently utilised by Koalas and is considered relatively poor habitat for the species. The broader landscape consists of multiple threats to Koala as a result of main roads, industrial developments and fragmented vegetation as demonstrated through koala hospital records (refer **Appendix F** - **Plan 5**).

It is anticipated that if Koala were to utilise the referral area it would be by opportunistic individuals traversing the vegetation in association with Oxley Creek within the northern and eastern extents, where connectivity and higher quality habitat is present. It is unlikely that Koala would utilise the south-west of the referral area where poor quality and highly fragmented vegetation is present.

No sightings of Koala, nor evidence of Koala, was recorded within the referral area.

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

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. There are no observed roosts on-site, with the nearest roost located 3.4 km south-east of the site in Parkinson, Avondale Crescent (419), however recent surveys as of 2020 found no flying-foxes at the camp, with numbers dwindling on-site in 2018. The nearest active camp, with Grey Headed Flying Foxes recorded as of 2022, is located 13.2 km west of the site in association with Goodna Creek in Redbank (428).

There is only one (1) record of the species from 2011 within a 5 km radius of the site according to Queensland WildNet sightings data. This record was within bush land 4 km north-east of the site. Notably, during extensive surveys and spotlighting efforts the species was not observed as a fly over species or utilizing the vegetation during the survey period.

No Grey-headed Flying-fox individuals were recorded during field surveys.

4.2.10 Migratory Species Assessment

Database searches returned sixteen (16) 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, no species were identified as having a moderate or greater likelihood of occurring on-site.

No migratory fauna species of conservation significance were recorded during the field survey.

A complete fauna species list is provided in **Appendix D.**

4.3. Risk of Impact

A potential 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.

After completing the field survey, a likelihood of occurrence (*i.e.,* a revised version of the potential of occurrence assessment) was undertaken 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 **Appendix C**, referred to State Government Regional Ecosystem mapping within the locality and known distributions of the TECs, to identify 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
- Coastal Swamp Sclerophyll Forest of New South Eales and South East Queensland
- 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 indicative Regional Ecosystems and species or habitat values on site typically associated with these TECs.

Field surveys confirmed no TECs were present within the referral area.

4.3.2 Threatened Flora Species

Database searches returned twenty-four (24) flora species, listed as threatened under the EPBC Act and/or NCA as having been previously recorded or potential to occur within 5 km of the referral area, as presented in **Appendices A & B**.

Based on the presence of species records within the locality and field surveys within the referral area, a revised likelihood of occurrence assessment was conducted to determine those threatened flora species with potential to occur within the referral area. The only species to be given a 'moderate' likelihood of occurrence, *Maundia triglochinoides,* based on a desktop assessment was revised as 'low' risk of occurrence within the referral area following field assessments (refer **Table 6**).

Field surveys confirmed that no EPBC or NCA listed flora species were present within the referral area.

Table 6: Field Assessment Confirmed Likelihood of Occurrence – Threatened Flora

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
Maundia triglochinoides	-	Vulnerable	**Moderate** While the majority of the referral area likely does not provide habitat know to support this species. Oxley Creek adjacent the eastern boundary of the site may provide potential habitat. According to Queensland Wildnet, three (3) observations of this species are recorded within 5 km of this site. Biomaps indicates that two (2) of these are from 2014, 3km south of the site in Kayannie St Environmental Habitat. As Oxley Creek is in close proximity to the referral area, the likelihood of occurrence for this species has been assigned 'moderate.'	**Low** Oxley Creek adjacent the eastern boundary of the site may provide potential habitat for this species. However, vegetation surrounding the creek was heavily disturbed by exotic species *Commelina diffusa* (Hairy Commelina), *Eichhormia crassipes* (Common Water Hyacinth) and *Spagneticola trilobata* (Singapore Daisy), which inhibit the growth of native and threatened plants. Furthermore, the vegetation within the balance area is highly modified due to historical clearing and pastoral activities with on-going maintenance. The man-made dam features within the referral area were dominated by exotic species, *Persicaria lapathifolia* (Pale Knotweed), *Ludwigia peploides* (Water Primrose), *Typha orientalis* (Typha) and *Nymphaea caerulea* (Blue Water Lily). According to Queensland Wildnet, three (3) observations of this species are recorded within 5 km of this site. Biomaps indicates that two (2) of these are from 2014, 3km south of the site in Kayannie St Environmental Habitat. As these recordings are not connected to Oxley Creek it is unlikely the species has spread into the area. Given the lack of sightings within the Oxley Creek area and field surveys confirming the absence of potential habitat within the referral area due to heavy modification there is a 'low' likelihood this species would occur within the site.

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

4.3.3 Threatened Fauna Species

Database searches returned twenty-seven (27) fauna species, listed as threatened under the EPBC Act and / or NCA, as having been previously recorded or predicted to occur within 5 km of the referral area, as presented in **Appendices A & B**.

Based on the presence of species records within the locality and field surveys within the referral area, a revised likelihood of occurrence assessment was conducted to determine those threatened fauna species with potential to occur within the referral area (refer **Appendix C**). The assessment identified that only one fauna species, Koala, as having a 'moderate' likelihood of occurrence following field surveys. All other threatened fauna species have a revised 'low' likelihood of occurrence (refer **Table 7**).

No fauna species listed under the EPBC Act and NCA, or evidence of their activity was recorded during field surveys.

Table 7: Field Assessment Confirmed Likelihood of Occurrence – Threatened Fauna

Scientific Name (common name)	EPBC	NCA	Desktop (Preliminary) Likelihood of Occurrence	Field Assessment Confirmed (Revised) Likelihood of Occurrence
Anthochaera phrygia (Regent Honeyeater)	Critically Endangered	Endangered	**Moderate** The referral area is mapped as containing entirely Category X (non-remnant) vegetation under the Queensland Vegetation Management Act 1999. Areas of Category B (remnant) and Category C (regrowth) vegetation are present along the adjacent eastern border in association with the Oxley Creek Corridor. The site itself is largely cleared as a result of historical modification. There is only one (1) confirmed record of the Regent Honeyeater in 2020 located proximal to the site and in the broader Willawong locality according to Atlas of Living Australia (ALA). However, Queensland Wildnet does not record any sightings of this species within 5 km of the site. However, as suitable habitat in the form of Eucalypt Woodland within is likely present within the referral area, the likelihood of the species to utilise the site or as fly-over has been assigned 'moderate.'	**Low** Throughout the proposed development area only scattered trees remain consisting of *Eucalyptus* and *Corymbia* species. A tree plot of the trees within the impact area found that the majority (77.3%) contain a DBH of ≤ 300 mm. Therefore, the diameters of these tree species are not of the mature large eucalypts this species prefers to forage. Field surveys identified the habitat to the north and east of the proposed development area, outside the impact zone within vegetation abutting Oxley Creek contains larger eucalypt species with more diversity. However, this vegetation was observed to be heavily disturbed with weed species and large areas of regrowth and juvenile trees as a result of historical clearing. Furthermore, given that Regent Honeyeaters are known to be outcompeted by aggressive bird species such as *Manorina melanocephala* (Noisy Miner). Field surveys observed this species to be utilizing the vegetation on-site which may reduce potential for Regent Honeyeaters to opportunistically forage on-site. In addition, the site is located proximally to continuous, high quality foraging habitat located within the Karawatha Forest Park 5.6 km south-east and Forestdale Park 5.8km south of the site, reducing potential that the species would utilize the vegetation site. Overall, there is considered to be low potential that the Regent Honeyeater would utilise the vegetation on-site due to the presence of marginal foraging habitat, lack of eucalypt diversity, competition from other species and the presence of more suitable foraging habitat in the surrounding landscape.

Hirundapus caudacutus (White-throated Needletail)	Vulnerable	-	**Moderate** The referral area contains wooded areas including open forests and clearings. According to Queensland Wildnet and ALA there are three (3) records of this species within 5km radius of the site. However, a review of these records indicate that a higher number of sightings have been recorded 5.7km west within Karawatha Forest Park, an area which provides more suitable roosting and/or foraging habitat due to containing mature intact bushland. As the species has been recorded over a variety of habitat types the likelihood of the species to utilise the site or as fly-over has been assigned 'moderate.'	**Low** The site largely lacks areas of vegetation with the majority representing a heavily modified open space with scattered trees. This environment is the less preferred of the White-throated Needletail and therefore it is unlikely the species would find the site as a suitable roosting area. The lack of recent records in close proximity to the referral area indicates this species is unlikely to occur within the referral area during roosting periods due to lack of mature wooded areas. There is a low likelihood for it to be found in airspace foraging given the species high mobility and recorded presence within the area. As the proposed development intends to retain and rehabilitate the wooded areas on-site and only clear the fragmented vegetation within the paddock area, it is not anticipated this species will be impacted by the action.
Ninox strenua (Powerful Owl)	-	Vulnerable	**Moderate** This species has been recorded within a variety of habitat types including open forests and woodlands, as well as along sheltered gullies in wet forests with dense understoreys, especially along watercourses. Records from Queensland Wildnet indicate four (4) sightings of the species within 5 kms of the site. The most recent of these records is from 2020 within bushland associated with Blunder Creek 2 km west of the site. As the species has been observed over a variety of habitat types as well as a number of records in the local area, the likelihood of occurrence has been assigned 'moderate.'	**Low** Despite Oxley Creek running adjacent the sites eastern and northern boundary, field observations of these areas found that preferred habitat in the form of wet forests with dense understory is not present. The majority of the vegetation recorded here was relatively immature with scattered trees throughout, thus not resembling old growth forest or remnant bushland that this species prefers. Additionally, although a few large trees with hollows were observed within the wooded areas of the site, these hollows were not large enough to support Powerful Owl nesting requirements. Ultimately, the lack of old growth trees on-site as well as the availability of more suitable remnant habitat within Blunder Creek west of the site and Toohey Forest Conservation Park north of the site reduces the likelihood that this species would utilize the vegetation on-site. There is a low likelihood, due to the recent records of the species in the area, that individuals could opportunistically use Oxley Creek to hunt for

				prey. However, the vegetation adjacent this area on-site is intended to be retained and therefore will remain available to the species should this occur.
Turnix melanogaster (Black-breasted Button Quail)	Vulnerable	Vulnerable	**Moderate** The referral area is mapped as Category X (non-remnant) vegetation as the result of an approved PMAV. Pre-clear mapping of the are indicates RE12.3.11 across the majority of the referral area. This RE is listed as containing habitat that may be suitable for Black-breasted Button Quail. Queensland Wildnet, ALA and Biomaps have not record sightings of this species within 5 km of the site. However, as suitable habitat may occur, likelihood of occurrence has been assigned to 'moderate.'	**Low** The site does not contain dry rainforest or vegetation immediately adjacent to rainforest, nor are heathlands present. Pre-clear mapping of the site indicates RE12.3.11 was present throughout the majority of the area. This RE is listed as containing habitat that may be suitable for Black-breasted Button Quail. Although highly fragmented, relic species representing this RE were observed throughout the site; *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia intermedia* (Pink Bloodwood). However, field surveys of the disturbed open woodland within the north and east of the referral area found no deep leaf litter of which the species needs to forage. Much of the ground cover contains invasive grasses or restricted invasive *Spagneticola trilobata* (Singapore Daisy) which smother out potential native species this species utilises for habitat. Importantly, no 'pivot-feeding' platelets were observed; a circular feeding depression within the ground cover which the Black-breasted Button Quail produces while foraging. Therefore, this species is unlikely to inhabit the site or surrounding properties due to a lack of suitable foraging habitat and absence of records within the local region.
Phascolarctos cinereus (Koala)	Endangered	Endangered	**Moderate** The referral area is mapped as Category X (non-remnant) vegetation as the result of an approved PMAV. Pre-clear mapping of the area indicates RE12.3.11 across the majority of the referral area. RE12.3.11 includes species known as koala habitat trees such as *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus*	**Moderate** Field surveys confirmed preferred Koala habitat is present within the referral in the form of eucalypt woodland within the north and east of the site in association with Oxley Creek. Field surveys of this woodland found it to be heavily disturbed by invasive species with historical clearing leaving only some trees and regrowth areas observed to be

siderophloia (Grey Ironbark) and *Corymbia intermedia* (Pink Bloodwood).

According to Queensland Wildnet Data, which dates back to the 1980s, thirty (30) Koalas have been known to occur within a 5 km radius of the site. However, a review of ALA and Biomaps indicated that the majority of these records are over 25 years old. The closest recorded sighting of Koala to the referral area is from 2013 in a small patch of trees adjacent Compton Road 3.5 km east of the site, separated by residential areas, industry and highly traversed roads. More recent records of Koala (within 5 years) are located in Toohey Forest Conservation Park 5.8 km north of the site and vegetation surrounding Scrubby Creek 7.8km south-east of the site. As the species is known to occur within the broader landscape as well as suitable habitat within the referral area, the likelihood of occurrence has been assigned 'moderate.'

dominated by *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus siderophloia* (Grey Ironbark) canopy species.

The majority of this wooded area, however, contained relatively immature eucalypt species, reminiscent of regrowth with scattered large canopy *Corymbia intermedia* (Pink Bloodwood), *Eucalyptus siderophloia* (Grey Ironbark), and *Eucalyptus tereticornis* Forest Red Gum) noted throughout this vegetation. This area of vegetation is intended to undergo rehabilitation, with the current proposed development intended to retain the area due to its higher habitat value relative to the surrounding area and connectivity value.

The balance of the site, and the area in which the proposed impact is intended, outside of these wooded portions, are cleared open paddock with fragmented vegetation and only scattered trees. A tree plot survey of the site indicated that the trees within these paddock spaces are largely non-juvenile, however, surveys indicated the site as containing fragmented ecological values with large portions subject to on-going maintenance for pastoral activities. Furthermore, the majority (77.3%) of the trees recorded within the impact zone were ≤ 300 mm, indicative of the immature and highly disturbed nature of the vegetation here.

Connectivity to these scattered vegetation patches is limited, with man-made dam features and fragmented open space lacking vegetation removing connectivity to the wooded bushland within the north and east of the site. Further, current industrial buildings and highly traversed roads, Learoyd Road and Gooderham Road, disconnect the site's vegetation to the north and west. Whilst proposed future development and low-density residential areas inhibit connectivity from the fragmented vegetation of the impact area to intact areas of bushland in the south.

				Notably, the site adjoins Category C (high value regrowth) and Category B (remnant) vegetation to the north and east in association with the Oxley Creek riparian corridor. Therefore, there is potential for transient Koala to occur within the bounds of the referral area. However, it is less likely that Koala would enter the disturbed open paddock areas of the site due to their inaccessibility and lack of mature trees. If Koala were to enter the site the area of retained bushland intended for rehabilitation and remaining unimpacted by the development is more likely to provide habitat potential for the species. No evidence of Koala in the form of scats, scratch marks or direct observations was recorded during field surveys, suggesting Koalas are not utilising the site. The presence of potential habitat of only poor quality and dated historical Koala records close to the site suggests a 'moderate to low' likelihood of occurrence on-site.
Pteropus poliocephalus (Grey-headed Flying-fox)	Vulnerable	-	**Moderate** The referral area is mapped as Category X (non-remnant) vegetation as the result of an approved PMAV. Pre-clear mapping of the area indicates RE12.3.11 across the majority of the referral area. RE12.3.11 indicates potential foraging habitat may be present within the referral area. The nearest roost located 3.4 km south-east of the site in Parkinson, Avondale Crescent (419), however recent surveys as of 2020 found no flying-foxes at the camp, with numbers dwindling on-site in 2018. The nearest active camp, with Grey Headed Flying Foxes recorded as of 2022, is located 13.2 km west of the site in association with Goodna Creek in Redbank (428). As the species is known to forage in a variety of habitats a desktop assessment of the likelihood of occurrence as been assigned 'moderate.'	**Low** Field surveys confirmed the presence of potential foraging habitat for the GHFF on-site in the form of fragmented eucalypt woodland within the north and east of the site, which contains *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus siderophloia (*Grey Ironbark). However, these trees are relatively immature and unlikely to present optimal mature foraging habitat when flowering. There is only one (1) record of the species from 2011 within a 5 km radius of the site according to Queensland WildNet sightings data. This record was within bushland 4 km north-east of the site. Notably, during extensive surveys and spotlighting efforts the species was not observed as a fly over species or utilising the vegetation during the survey period. Targeted surveys did not detect any GHFF on or in the vicinity of the site.

	Furthermore, larger patches of intact bushland are available south of the site in Greenbank Military Base and east in Venman Bushland National Park. These areas offer higher value foraging environment for Grey-headed Flying-fox and are likely to be preferred to the small patch of disturbed woodland found on-site. Due to the lack of recorded sightings in the area and availability of higher quality habitat for this highly mobile species adjacent the site, there is low likelihood that the species may opportunistically forage on-site.

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

5. Impact Assessment

5.1. Potential Project Related Impacts

The proposed development involves the establishment of industrial allotments occupying an area of 12.1 ha (impact area). This will involve the clearing of Category X (non-remnant) vegetation which has been assessed on-ground as representing primarily 'Fragmented Ancillary Koala Habitat' and 'Fragmented Paddock.'

5.1.1 Impact Avoidance and Minimisation

Field assessments identified northern and eastern extents of the referral area as providing higher habitat quality. These areas consist of a largely treed canopy providing potential connectivity to existing vegetation to the north (under Learoyd Road) and south of the referral area following Oxley Creek. These areas do show relatively high disturbance levels, due to historical land practices, including dense weed infestation at the ground and shrub layer. Nevertheless, much of this are provides 'Higher Quality Koala Habitat' which is proposed to be retained and rehabilitated as part of the action.

The proposed action is situated within a highly modified environment with minimal habitat quality and limited connectivity value. Areas identified as higher quality habitat will be almost entirely retained, enhancing linkages to existing habitat through rehabilitation works of disturbed areas.

5.1.2 Potential Direct Impacts

Vegetation Clearing

The project is predicted to directly impact 12.1 ha of the 22.27 ha referral area. A breakdown of vegetation to be impacted is provided in **Table 8** and **Appendix F** - **Plan 6.**

Habitat Loss

The Project is predicted to impact non-remnant habitat, which provides marginal habitat values for a range of native flora and fauna species. Habitat identified as 'Higher Quality Koala Habitat' or 'Disturbed Koala Habitat' is to be almost entirely retained and rehabilitated. The impact area will mostly occupy vegetation identified as 'Fragmented Ancillary Koala Habitat' and 'Fragmented Paddock'

Table 8: Potential direct impacts to field verified vegetation communities

Vegetation communities	Extent within referral area (ha)	Impact (ha)	Retained (ha)
Higher Quality Koala Habitat	4.68	0.26	4.42
Disturbed Koala Habitat	2.53	0	2.53
Fragmented Ancillary Koala Habitat	5.04	5.04	0
Fragmented Paddock	7.44	6.71	0.73
Dams and waterbodies	2.58	0.09	2.49
Total	**22.27**	**12.1**	**10.17**

The MNES identified as having a moderate and higher likelihood of occurrence based on a desktop and field assessments include Koala. Subsequently, Koala has 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 9**.

The risk of impact assessment (refer to **Table 9**) 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 9: Fauna with a moderate or greater likelihood of occurring in the referral area post field survey analysis

Scientific Name	Common Name	EPBC Act Status	Likelihood of Occurrence	Risk of Impact
Threatened fauna species				
Phascolarctos cinereus	Koala	Endangered	**Moderate-Low** Field surveys confirmed potential Koala habitat is present on-site in the form of eucalypt woodland dominated by *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus siderophloia* (Grey Ironbark). The proposed impact area occupies a space that has been historically cleared and highly disturbed resulting in open fragmented paddocks and scattered trees. However, higher quality habitat, through both habitat quality and connectivity value, is present within the northern and eastern extents of the site. This area is to be retained and rehabilitated ensuring current connectivity value is maintained and enhanced. No evidence of Koala in the form of scats, scratch marks or direct observations was recorded during field surveys, including targeted SAT or spotlighting surveys, suggesting Koalas are not utilising the site. However, the presence of potential habitat and the proximity of historical Koala records close to the site suggests a moderate to low likelihood of occurrence on-site. Tree plot surveys indicate that within the 12.1 ha impact zone a total of only 497 Koala habitat trees will be impacted by the development. Notably these trees are in a scattered and sparse community, with the proposed development opting to retain the area most likely to be utilised by Koala, containing a denser canopy of and higher quality trees. The impact area will be primarily located in areas where the likelihood of Koala occurrence is low, fragmented open paddock space with scattered vegetation. Regardless, the removal of Koala habitat trees within the referral area identifies a potential risk of impact.	Yes

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 pollination, 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 result from construction activities and/or the operational phase of the project have 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, however, the site is already highly disturbed by weed invasion, most notably exotic grasses, *Spagneticola trilobata* (Singapore Daisy) and *Lantana camara* (Lantana). With implementation of standard mitigation measures, the project is likely to result in a negligible impact to ecological values due to the potential introduction/spread of weeds.

Vehicle Movement

During construction, a number of vehicles will be required on the referral area. Direct impacts from vehicle movements on threatened species and vegetation communities include:

- damage or destruction of vegetation or fauna habitat by vehicles traversing these areas; and
- fauna strike.

Indirect impacts include:

- interference of fauna through visual and noise impacts. This in turn can affect feeding, roosting, breeding or nesting behaviour;
- introducing and/or spreading weeds or feral animals carried on or in vehicles, resulting in deterioration or loss of vegetation and important fauna habitat; and
- damage or destruction of vegetation and fauna habitat through smothering by dust generated by vehicles traversing the project area.

With implementation of standard mitigation measures, such as exclusions fencing, 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 and highly mobile fauna are present on the site.

Earthworks

Construction activities have the potential to generate dust emissions. Dust emissions during construction will be temporary. The main sources of dust will be generated via:

- wheel-generated dust from the haul roads created for the construction phase;
- dust lift-off from exposed surfaces (e.g. construction roads and pads);
- earthworks, including construction of the embankments, and moving, dumping and shaping material; and
- vegetation and soil clearing of the land.

Excessive deposition of dust on leaves of plants can suppress their growth and photosynthesis, resulting in reduced habitat quality for fauna. High levels of airborne dust can irritate the respiratory systems of fauna and potentially result in ingestion of dust-coated seeds and other foods. Excessive deposition of dust on open water bodies may also degrade

water quality and overall habitat quality for fauna. Notably the referral area exists within a highly urbanised environment with surrounding areas utilised for industry. Presence of heavy vehicle movement already incurs dust emissions within the locality. Regardless, 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 site. Some light spillage will be inevitable and is likely to be contained. Potential impacts associated with light emissions will be temporary and are unlikely to be significant.

In its current state the referral area is subject to substantial light spillage from the adjacent industrial buildings west of the site, as was noted during spotlighting surveys. This light pollution is likely to evoke avoidance from fauna within the area, therefore the proposed development is unlikely to increase light emission within this portion of the site. 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 and operation.

Noise and Vibration

Noise levels greater than existing ambient noise levels are expected during the construction within the project area. Sources of noise are likely to consist of short, intense pulses from mobile plant equipment, and more prolonged noise, with consistent vibration, pitch and volume from generators, excavators and pumps, in addition from noise from vehicles.

Both steady continuous and single noise events have the potential to lead to ecological impacts. Construction noise is expected to elicit some avoidance response from fauna using the surrounding vegetation though, with consideration of the extent of habitat available in and adjoining the referral area and species mobility, this is likely to be a temporary and negligible to minor impact.

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 habitat availability due to edge effects. The project is likely to result in a temporary and minor impact to ecological values due to increased human presence on site during the construction and operational period.

5.2. Potential Impacts to Matters of National Environmental Significance

As detailed in the previous sections, field surveys confirmed that, with the exception of Koala, the following are unlikely to occur or have a low likelihood of occurrence on the referral area.

- EPBC Act listed TECs;
- EPBC Act and NC Act listed flora species;
- EPBC Act and NC Act listed fauna species;
- EPBC Act Migratory fauna species.

In reference to **Table 9**, the threatened fauna species with a moderate or higher likelihood of occurring within the referral area post field survey are Koala, and its supported habitat may be at risk of potential project related impacts and a significant impact assessment is considered necessary.

6. Avoidance, Mitigation and Management Measures

6.1. Construction Phase

General mitigation measures to be implemented during the construction phase of the Project are outlined below. It is understood that the impact area will be securely fenced for security purposes and to mitigate potential threats to fauna within the retained rehabilitation area at operation.

6.1.1 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

6.1.2 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

6.1.3 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. Significant 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, if present, 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 should they occur. Certain areas could 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 person and advice sought where necessary.

7. Significant Impact Assessment

7.1. Significant Impact Assessment Definitions

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

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 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.*

7.2. *Phascolarctos cinereus* (Koala)

7.2.1 Conservation Status

The Koala is listed as Endangered under the EPBC Act.

7.2.2 Description

Koalas (*Phascolarctos cinereus*) are native Australian tree-dwelling marsupials with predominantly grey coloured fur.

7.2.3 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.

7.2.4 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.

Koalas are highly territorial, and individuals maintain their own home range which may overlap with other individuals. 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.

7.2.5 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.

7.2.6 Significant Impact Assessment

As of 12 February 2022, the EPBC Act referral guidelines for the vulnerable Koala have been redacted following the elevation of the Koala listing status under the EPBC Act to Endangered. As such, the Federal Significant Impact Guidelines are to be utilised in the interim to determine if a significant impact on Koala may occur as a result of the proposed action. The assessment methodology included site surveys and consideration of Commonwealth, State and Local Government environmental database searches.

To determine whether the proposed action is likely to have a significant impact on the Koala, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided in **Appendix F**. The results of this assessment determined that a significant impact on the Koala is not likely.

8. EPBC Act Determination Advice

8.1. EPBC Act Significant Impact Guidelines

As of 12 February 2022, the EPBC Act referral guidelines for the Vulnerable Koala have been redacted following the elevation of the Koala listing status under the EPBC Act to Endangered. As such, the Federal Significant Impact Guidelines are to be utilised in the interim to determine if a significant impact on Koala may occur as a result of the proposed action. The assessment methodology included site surveys and consideration of Commonwealth, State and Local Government environmental database searches.

Following assessment of the significant impact guidelines, the project is not considered to have a significant impact on Koala as only poor quality, fragmented habitat is to be impacted with higher quality habitat retained and rehabilitated. Further, the Action is not considered to interfere substantially with the recovery of the Koala as no residual impacts were identified. As a result, the proposed development is identified as having a **low risk of significant impact on Koala** and is not recommended for referral, however, despite assessment against the relevant EPBC Act guidelines demonstrating that referral is not recommended, the proposed action has been referred to the Department for assessment in order to provide certainty for the proponent (*i.e.,* a not a controlled action or controlled action determination).

8.2. Residual Impacts and EPBC Act Offset Policy

No residual impacts were identified.

9. Conclusion

This ecological assessment has identified Matters of National Environmental Significance (MNES) recorded or predicted to potentially occur on or near 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.

The proposed action involves the clearing area of 12.1 ha which is not considered higher quality habitat for Koala. Notably, 10.17 ha of higher quality and disturbed habitat as well as some fragmentated paddock area are proposed to be retained and rehabilitated. As per assessment against the significant impact criteria, referral of the action is **not** recommended for an EPBC Act 'controlled action' assessment. Desktop assessments and field surveys indicated that, at present, Koalas are not utilising the site. However, if Koala were to be present within the referral area, this would likely occur in the northern and eastern extents where higher quality habitat and potential connectivity is present. These areas are to be retained through the proposed action.

Despite assessment against the relevant EPBC Act guidelines demonstrating that referral is not recommended, the proposed action has been referred to the Department for assessment in order to provide certainty for the proponent (*i.e.,* a not a controlled action or controlled action determination).

10. References

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Hanger, J., Villiers, D., Forbes, N., Nottidge, B., Beyer, H., Loader, J. and Timms, P. 2016. Moreton Bay Rail Koala Management Program. Prepared for Department of Transport and Main Roads.

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Saunders, D.L. and Tzaros, C.L. 2011. National Recovery Plan for the Swift Parrot Lathamus discolor, Birds Australia, Melbourne.

11. 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

Flora and Fauna Species Lists

Appendix E

SAT survey results

Appendix F

Significant Impact Guideline 1.1 Assessment - Koala

Appendix A

EPBC Act Protected Matters Search Tool Results

Australian Government

Department of Agriculture, Water and the Environment

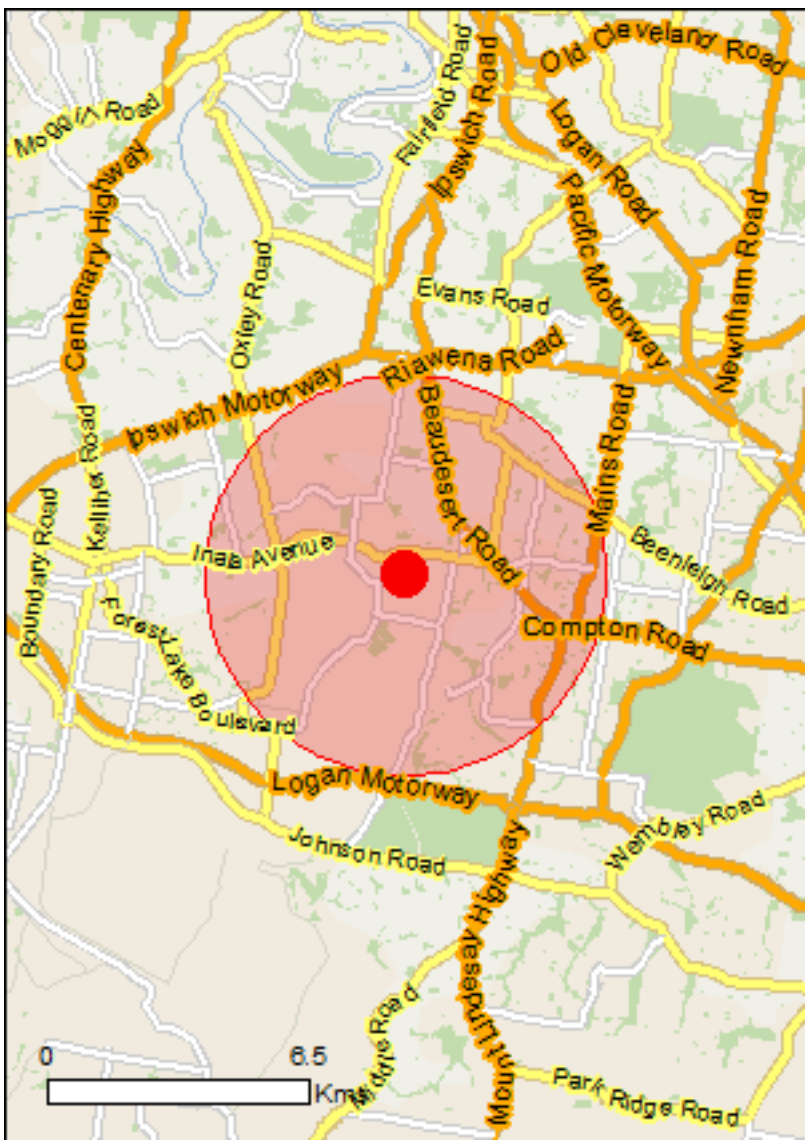
EPBC Act Protected Matters Report

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: 23/05/22 12:56:12



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:	5
Listed Threatened Species:	45
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:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	21
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:	44
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar) [Resource Information]

Name	Proximity
Moreton bay	10 - 20km 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
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community known to 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 may 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 likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to 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
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat known to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely 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

Name	Status	Type of Presence
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
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
Frogs		
Mixophyes fleayi		
Fleay's Frog [25960]	Endangered	Species or species habitat may occur within area
Insects		
Argynnis hyperbius inconstans		
Australian Fritillary [88056]	Critically 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 may 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 likely to occur within area
Macroderma gigas		
Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area
Petauroides volans		
Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Petaurus australis australis		
Yellow-bellied Glider (south-eastern) [87600]	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]	Endangered	Species or species habitat known to occur within area
Potorous tridactylus tridactylus		
Long-nosed Potoroo (northern) [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		
Arthraxon hispidus		
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
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
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat may occur within area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area
Endiandra floydii Floyd's Walnut, Crystal Creek Walnut [52955]	Endangered	Species or species habitat may occur within area
Fontainea venosa [24040]	Vulnerable	Species or species habitat may occur within area
Gossia gonoclada Angle-stemmed Myrtle [78866]	Endangered	Species or species habitat likely to 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
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically 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 may occur within area
Reptiles		
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
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

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		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		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
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 known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Name	Threatened	Type of Presence
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

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 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 known to 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

Name	Threatened	Type of Presence
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
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
Blunder Creek Reserve	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

Name	Status	Type of Presence
		habitat likely to occur within area
Anas platyrhynchos Mallard, Northern 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 within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove, Spotted 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
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

Name	Status	Type of Presence
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		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus africanus Climbing Asparagus, Climbing Asparagus Fern [66907]		Species or species habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
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
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913]		Species or species habitat likely to occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to 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
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		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
Opuntia spp. Prickly Pears [82753]		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

Name	Status	Type of Presence
		within area
Parthenium hysterophorus		
Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area
Sagittaria platyphylla		
Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		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 likely to occur within area

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

-27.6001 153.0165

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

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: Native
Queensland status: Rare and threatened species
Records: Confirmed
Date: Since 1980
Latitude: -27.6001
Longitude: 153.0165
Distance: 5
Email: nicoletomlinson@saundershavill.com
Date submitted: Monday 23 May 2022 12:56:11
Date extracted: Monday 23 May 2022 13:00:02

The number of records retrieved = 9

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	amphibians	Myobatrachidae	*Crinia tinnula*	wallum froglet		V		1
animals	birds	Apodidae	*Hirundapus caudacutus*	white-throated needletail		V	V	1
animals	birds	Charadriidae	*Charadrius mongolus*	lesser sand plover		E	E	1
animals	birds	Strigidae	*Ninox strenua*	powerful owl		V		4
animals	mammals	Phascolarctidae	*Phascolarctos cinereus*	koala		E	E	30
animals	mammals	Pseudocheiridae	*Petauroides armillatus*	central greater glider		E	V	1
plants	land plants	Maundiaceae	*Maundia triglochinoides*			V		3/3
plants	land plants	Myrtaceae	*Eucalyptus curtisii*	Plunkett mallee		NT		36/3
plants	land plants	Myrtaceae	*Gossia gonoclada*			CR	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 (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.*
The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).
This number is output as 99999 if it equals or exceeds this value. A second number located after a / 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 Threatened Ecological Communities (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 may 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. This TEC is associated with RE12.1.1 and RE12.3.20.	Desktop analysis and detailed field surveys confirmed that this TEC does not occur on-site or adjacent to the site. The Regional Ecosystems associated with this TEC were confirmed to be absent on-site.	Low	Unlikely
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community known to occur within area	The Coastal Swamp Sclerophyll Forests of South-eastern Australia is a type of forest or scrub associated with freshwater (to brackish) wetlands on low-lying coastal areas. Several regional ecosystem communities coincide with this TEC, including Least Concern RE 12.2.7, RE 12.3.4/12.3.4a, RE 12.3.5, RE 12.3.6 and RE 12.3.20.	Desktop analysis and detailed field surveys confirmed that this TEC does not occur on-site or adjacent to the site. A small patch of *Melaleuca quinquenervia* (Broad-leaf Paperbark) exist within the far south-west of the site however these are in a scattered formation and heavily fragmented from other areas of vegetation, thus do not represent any of the TECs listed. The Regional Ecosystems associated with this TEC were confirmed to be absent on-site.	Low	Unlikely
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. This TEC is associated with RE12.3.1, RE12.5.13, RE12.8.3, RE12.8.4, RE12.11.1, RE12.11.10, RE12.12.1 and RE12.12.16.	Desktop analysis and detailed field surveys confirmed that this TEC does not occur on-site or adjacent to the site. The Regional Ecosystems associated with this TEC were confirmed to be absent on-site.	Low	Unlikely

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. The Regional Ecosystems associated with this TEC were confirmed to be absent on-site.	Low	Unlikely
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	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 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'.	Desktop analysis and detailed field surveys confirmed that this TEC does not occur on-site or adjacent to the site. The Regional Ecosystems associated with this TEC were confirmed to be absent on-site.	Low	Unlikely

Listed threatened species

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
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 on nectar from a wide range of eucalypts and mistletoes, particularly in areas with box-ironbark associations, preferring more fertile sites with higher soil water content, more typical of Land Zone 3. They have also been found to prefer large diameter eucalypt trees for foraging as they typically produce more nectar. The Regent Honeyeater's preferred foraging species is *Corymbia maculata* which is primarily found in southern NSW. Similar species, *Corymbia citriodora* and *C. henryi* are more common in south-east Queensland.	The referral area is mapped as containing entirely Category X (non-remnant) vegetation under the Queensland *Vegetation Management Act 1999*. Areas of Category B (remnant) and Category C (regrowth) vegetation are present along the adjacent eastern border in association with the Oxley Creek Corridor. The site itself is largely cleared as a result of historical modification with areas until recently still undergoing maintenance for pastoral activities. Throughout the proposed development area only large, scattered trees remain consisting of *Eucalyptus* and *Corymbia* species. A tree plot of the trees within the impact ares found that the majority (77.3%) contain a DBH of ≤ 300 mm. Therefore, the diameters of these tree species are not of the mature large eucalypts this species prefers to forage. Field surveys identified the habitat to the north and west of the proposed development area, out site the impact zone within vegetation abutting Oxley Creek contains larger Eucalypt species with more diversity. However, this vegetation was observed to be	Moderate	Low

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
						heavily disturbed with weed species and large areas of regrowth and juvenile trees. There is only one (1) confirmed records of the Regent Honeyeater in 2020 located proximal to the site and in the broader Willawong locality according to Atlas of Living Australia (ALA). The exact location of this recorded sighting is withheld in order to protect the threatened species. The point where it has been placed is 2 km west of the referral area however coordinate uncertainty could place it anywhere 2.9km from this point. However, Queensland Wildnet does not record sightings of this species within 5 km of the site. Without other records within the local region it is unlikely the species is holds an important population within the area, especially given the high level of modification and urbanization. Furthermore, given that Regent Honeyeaters are known to be outcompeted by aggressive bird species such as *Manorina melanocephala* (Noisy Miner). Field surveys observed this species to be utilizing the vegetation on-site which may reduce potential for Regent		

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
						Honeyeaters to opportunistically forage on-site. In addition, the site is located proximally to continuous, high quality foraging habitat located within the Karawatha Forest Park 5.6 km south-east and Forestdale Park 5.8km south of the site, reducing potential that the species would utilize the vegetation site. Overall, there is considered to be low potential that the Regent Honeyeater would utilise the vegetation on-site due to the presence of marginal foraging habitat, lack of eucalypt diversity, competition from other species and the presence of more suitable foraging habitat in the surrounding landscape.		
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	There are no wetlands present on-site. The adjacent Oxley Creek is heavily disturbed with a lack of tall dense vegetation of which this species prefers. Given the lack of records of the Australasian Bittern within the local region and within Queensland as a whole it is unlikely this species occurs within the site or its surrounds.	Low	Unlikely

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
					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.			
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 in the form of wetlands and mudflats occurs on-site.	Low	Unlikely
Charadrius mongolus	Lesser Sand Plover	E	E	879	The Lesser Sand Plover is found on sand and mudflats. This species feeds on small molluscs, worms and crustaceans.	No suitable foraging or breeding habitat in the form of sand or mudflats occurs on-site.	Low	Unlikely
Cyclopsitta diophthalma coxeni	Coxen's Fig Parrot	E	E	59714	The Coxen's Fig Parrot occurs in rainforest habitats including subtropical rainforest, dry	Preferred foraging vegetation including figs and *Elaeocarpus grandis*, *Syzygium*	Low	Unlikely

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
					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*.	*corynanthum*, *Litsea reticulata* and *Grevillea robusta* were not recorded within the referral area during field surveys. No rainforest habitat is present within the assessment area or adjacent vegetation therefore it is considered unlikely this species will occur within the proposed impact area.		
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 maneuvering in flight but provide cover for ambushing of prey.	This site does not contain the mosaic of vegetation types that this species favours and contains only scattered large, tall trees for roosting. There was no evidence of permanent residence on site and records from Biomaps and ALA indicate that there are no records of this species within 5 km radius of the site. Therefore, there is low potential that the species would utilize the site, especially with the availability of larger areas of intact habitat to the south in Forestdale Park.	Low	Low
Falco hypoleucos	Grey Falcon	V	V	929	The Grey Falcon is a medium-sized, compact, pale falcon with a heavy, thick-set, deep-chested appearance. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey. Preys primarily on birds, especially parrots and	Scattered large trees and marginal open woodland are present within the site, however, the majority of the site is heavily disturbed and represents open paddock space in a urbanized landscape. Field surveys did not observe any large nests within the present tall trees which could indicate the presence of a large raptor bird such as the Grey Falcon.	Low	Low

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
					pigeons, using high-speed chases and stoops; reptiles and mammals are also taken. Like other falcons it utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse; peak laying season is in late winter and early spring; two or three eggs are laid. The nests chosen are usually in the tallest trees along watercourses, particularly River Red Gum (*Eucalyptus camaldulensis*) and Coolibah (*E. coolabah*).	Although Oxley Creek runs adjacent the eastern border of the referral area it does not contain a continuous wooded landscape with large trees of which this species prefers, instead representing a disturbed and fragmented environment. Furthermore, a review of Queensland Wildnet, ALA and Biomaps indicate no records of the species within the region. For these reasons it is unlikely that this species would occur.		
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 contains heavily modified paddock dominated by weed species which is unlikely to provide suitable habitat for this species. The marginal patch of woodland to the north and east of the site is heavily disturbed by weed with the understory dominated by invasive vines and grasses, not the native understory this species prefers. Additionally, the species is very rarely observed in southern Queensland, and thus this species is not expected to occur on-site.	Low	Unlikely
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	Mistletoe was observed on-site however in limited numbers, which is unlikely to be able to sustain a viable population of Painted Honeyeater. Although the north and east of the referral area contain wooded bushland	Low	Low

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
					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.	with eucalypt species, mature large trees which could support mistletoes were limited. Additionally, the majority of the site is cleared with scattered large trees in a disturbed open paddock. Areas of large intact bushland with higher numbers of mature trees area available south of the site in association with Glider Forest and Greenbank Military Base. Therefore, the potential for this species to utilize this area is low due to the heavy disturbance, limited food sources and availability of more suitable habitat within 5 km of the site.		
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 recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps.	The site largely lacks areas of vegetation with the majority representing a heavily modified open space with scattered larger trees. This environment is the less preferred of the White-throated Needletail and therefore it is unlikely the species would find the site as a suitable roosting area. The woodland within the north and east of the site is heavily disturbed by invasive species, with the majority representing immature vegetation. According to Queensland Wildnet and ALA there are three (3) records of this species within 5km radius of the site. However, a review of these records indicate that a higher	Moderate	Low

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
						number of sightings have been recorded 5.7km west within Karawatha Forest Park, an area which provides more suitable roosting and/or foraging habitat due to containing mature intact bushland. Thus this species is unlikely to occur on-site during roosting periods due to lack of mature wooded areas, however, there is a low likelihood for it to be found in airspace foraging given the species high mobility and recorded presence within the area. As the proposed development intends to retain and rehabilitate the wooded areas on-site and only clear the fragmented vegetation within the open space area, it is not anticipated this species will be impacted by the action.		
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.	The referral area is mapped as containing entirely Category X (non-remnant) vegetation under the Queensland *Vegetation Management Act 1999*. Aerial imagery and on-ground surveys indicate the site is highly disturbed and largely cleared with exception to regrowth vegetation within the north and east of the site. Field surveys recorded *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus siderophloia* (Grey Ironbark) on-site both of which are	Low	Low

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
						winter flowering species which could provide some foraging potential to this species. These trees are however scattered and in a disturbed open space instead of intact remnant woodland of which this species prefers. Kawarwatha Forest Park, Glider Forest and Forestdale Park are all areas of intact bushland to the south of the site which are identified to provide more suitable habitat to support the Swift Parrot. According to Queensland Wildnet there are no records of the species within a 5km radius of the site however there is one (1) record of this species on ALA data sightings. This recorded sighting is 14.7 km south-west of the site and is from over 30 years ago and therefore is not considered a good indication of species presences within the area. Overall, due to the highly disturbed state of the site, the limited area of foraging habitat, and presence of more suitable foraging habitat within the broader landscape, there is considered to be low potential that the Swift Parrot would utilize the vegetation on-site and in the adjoining vegetation. Any occurrence would be limited to opportunistic		

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
						foraging and the vegetation would be unlikely to be critical foraging habitat.		
Ninox strenua	Powerful Owl	-	V	-	Found in open forests and woodlands, as well as along sheltered gullies in wet forests with dense understoreys, especially along watercourses. Will sometimes be found in open areas near forests such as farmland, parks and suburban areas, as well as in remnant bushland patches. Needs old growth trees to nest.	Despite Oxley Creek running adjacent the sites eastern and northern boundary, field observations of these areas found that preferred habitat in the form of wet forests with dense understory is not present. The majority of the vegetation recorded here was relatively immature with scattered larger trees throughout, thus not resembling old growth forest or remnant bushland that this species prefers. Records from Queensland Wildnet indicate four (4) sightings of the species within 5 kms of the site. The most recent of these records is from 2020 within bushland associated with Blunder Creek 2 km west of the site. The vegetation within this area is remnant and less fragmented than the small portion of remnant on the sites eastern boundary, thus more suited to this species requirements. Additionally, although a few large trees with hollows were observed within the wooded areas of the site these hollows were not large enough to support Powerful Owl nesting requirements.	Moderate	Low

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
						Ultimately, the lack of old growth trees on-site as well as the availability of more suitable remnant habitat within Blunder Creek west of the site and Toohey Forest Conservation Park north of the site reduces the likelihood that this species would utilize the vegetation on-site. There is a low likelihood, due to the recent records of the species in the area, that individuals could opportunistically use Oxley Creek to hunt for prey. However, the vegetation adjacent this area on-site is intended to be retained and therefore will remain available to the species should this occur.		
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), 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.	No suitable foraging or breeding habitat in the form of wetlands and mudflats occurs on-site.	Low	Unlikely

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
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 foraging or breeding habitat in the form of wetlands occur on-site.	Low	Unlikely
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, nor are heathlands present. Pre-clear mapping of the site indicates RE12.3.11 was present throughout the majority of the area. This RE is listed as containing habitat that may be suitable for Black-breasted Button Quail. Although highly fragmented, relic species representing this RE were observed throughout the site; *Eucalyptus tereticornis* (Forest Red Gum) and *Corymbia intermedia* (Pink Bloodwood). However, field surveys of the disturbed open woodland within the north and east of the referral area found no deep leaf litter of which the species needs to forage. Much of the ground cover contains invasive grasses or restricted invasive *Spagneticola trilobata* (Singapore Daisy). Importantly, no "pivot-feeding' platelets were observed; a circular feeding depression within the ground cover which the Black-breasted Button Quail produces while foraging.	Moderate	Low

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
						Furthermore, Queensland Wildnet, ALA and Biomaps have not record sightings of this species within 5 km of the site. Therefore, this species is unlikely to inhabit the site or surrounding properties due to a lack of suitable foraging habitat and absence of records within the local region.		
Frogs								
Crinia tinnula	*Wallum Froglet*	V	V	686	The wallum froglet can be found in acidic wetlands (pH 4.3-5.2) within Melaleuca swamps, sedgeland, wet or dry heathland and wallum/woodland areas in the sandy coastal lowlands (<100m asl) of south-east Queensland. Occasionally this species occurs in adjacent forests with a heathy understorey and are known to persist in disturbed wallum habitat such as 4WD-impacted sites, roadsides, quarry site, and exotic pine plantations and partly cleared areas.	No suitable foraging or breeding habitat in the form of wallum heathlands or acidic wetlands occurs on-site. The dams on-site were noted to be heavily disturbed, lacking native sedges with no canopy coverage. Furthermore, the vegetation in association with Oxley Creek to the east of the site is heavily disturbed, with highly invasive *Spagneticola trilobata* (Singapore Daisy) dominating the ground layer, therefore smothering out any potential wallum or sedge habitat.	Low	Low
Mixophyes fleayi	*Fleay's Frog*	E	E	25960	Fleay's Frog is associated with montane rainforest and open forest communities adjoining rainforest. The species occurs along stream habitats from first to third order streams (i.e. small streams close to their origin through	The creek habitat adjacent the site to the north and east is heavily modified and not considered to contain montane rainforest features. Furthermore, this species is most commonly recorded at mid-elevation sites, of	Low	Unlikely

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
					to permanent streams with grades of 1 in 50) and is not found in ponds or ephemeral pools.	which the referral area is not. Additionally, recordings of this species within the wider Brisbane region are generally lacking and thus the likelihood of this species occurring is unlikely.		
Insects								
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* (Blady Grass). This habitat is called *Melaleuca* wetlands, although the larval food plant does not occur in all sub-types of this plant community.	Preferred coastal habitat is not present throughout the assessment area nor was the species larval food plant, *Viola betonicifolia* (Mountain Violet), recorded on-site. It is therefore considered unlikely the highly modified environment present on-site could support this species.	Low	Unlikely
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 and moist eucalypt forest habitats at high elevations.	No suitable high elevation habitat nor rainforest vegetation to support this species occurs on-site.	Low	Unlikely

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
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.	The site has been subjected to high levels of disturbance with the majority of the site historically cleared and continuously modified through the years. No suitable denning habitat was observed during field surveys. Due to the lack of suitable habitat, it is unlikely that this species would occur.	Low	Unlikely
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	The site has been subjected to high levels of disturbance with the majority of the site historically cleared and continuously modified through the years. No suitable denning habitat was observed during field surveys. Due to the lack of suitable habitat, it is unlikely that this species would occur.	Low	Unlikely

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					large areas of relatively intact vegetation through which to forage.			
Macroderma gigas	Ghost Bat	V	e	174	Ghost Bats have been recorded in both arid regions (Pilbara region) and rainforest areas (north Queensland). *Macroderma gigas* roost in caves, old mine tunnels and in deep cracks in rocks. This species is distributed widely however patchily across the northern half of Australia, being found in a variety of tropical habitats.	No suitable foraging or roosting habitat to support this species occurs on-site, or in the nearby vicinity. Additionally, it is known that habitat modification for livestock is attributable to the decline of this species habitat. The sites historical clearing for agricultural purposes makes it unlikely this species would be present within the site or surrounding vicinity.	Low	Unlikely
Petauroides Volans / Petauroides armillatus	Greater Glider / Central 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.	The majority of the referral area and all of the intended impact zone is a highly disturbed open space environment which was historically cleared for agricultural purposes and contains only scattered large trees. Potential foraging habitat for the Greater Glider is present on-site in the form of disturbed open woodland to the north and east of the site. However, this area is again highly disturbed containing fragmented ecological values and lacking a significant number of large, old growth hollow-bearing trees that are essential nesting habitat. Field surveys observed low numbers of larger hollow bearing trees within the wooded areas	Low	Low

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		EPBC Act	NC Act					
						to the north and east with the potential to be utilized by Greater Glider however the patch size of this wooded area is considered too small to support a viable population of this species. This is due to studies suggesting that in lower productivity and disturbed forests the Greater Glider requires a larger home range than that of a intact forest with an abundance of old growth hollow bearing trees (Eyre 2004; Smith et al., 2007). Areas of large intact bushland with old growth trees exist south of the site in Glider Forest, Karawatha Forest and the Greenbank Military Base. These patches of vegetation are likely to provide higher value breeding and foraging habitat for the survival of Greater Glider than that of the small patch of woodland on-site. In addition, records of this species from Queensland Wildnet have noted one (1) sighting of Greater Glider within a 1 km radius of the site. This record is within Karawatha Forest Park in 1995 and therefore, given that it is almost 30 years old, is not a viable indication of species presence within the surrounding landscape.		

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						As a result of the marginal and fragmented habitat on-site, minimal hollow bearing trees and more suitable areas of in-tact remnant vegetation available within the wider landscape, it is expected there is a low probability that this species would occur on-site.		
Petaurus australis australis	Yellow-bellied Glider	V	V	87600	The Yellow-bellied Glider largely occurs in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Denning occurs within hollows of large trees, with the species preferring to live in family groups of two to six individuals. This species is very mobile and occupy large home ranges of 20 to 85 ha to encompass dispersed and seasonally available food resources.	The fragmented and highly modified environment within the site is considered unlikely to support this species. Although some hollows were noted within remnant large trees within the eastern vegetated area on-site, the small size of the bushland surrounded by urbanized area has isolated it from other areas of intact bushland and ultimately does not satisfy the Yellow-bellied Glider's requirement of a large home range.	Low	Unlikely
Phascolarctos cinereus	Koala	E	E	85104	The Koala is found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland.	The entire site is mapped as Category X (non-remnant) under the *Vegetation Management Act 1999* (Qld). Desktop investigations found that no Koala Habitat Areas are mapped on-site however it does fall within a Koala Priority Area and Identified Broad Hectare Area.	Moderate	Moderate - Low

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						Field surveys confirmed preferred Koala habitat is present on-site in the form of immature eucalypt woodland within the north and east of the site in association with Oxley Creek. Although this woodland is heavily disturbed by invasive species areas were observed to be dominated by *Eucalyptus tereticornis* (Forest Red Gum) and *E. siderophloia* (Grey Ironbark) canopy species. The majority of this wooded area however contained relatively immature eucalypt species, reminiscent of regrowth with scattered large canopy *Corymbia intermedia* (Pink Bloodwood), *E. siderophloia* (Grey Ironbark) and *E. tereticornis* (Forest Red Gum) were noted throughout this vegetation. As a result of a compliance notice invoked on the site by a previous owner, this area of vegetation is intended to undergo rehabilitation, with the current proposed development intended to retain the area due to its higher habitat value relative to the surrounding area. The balance of the site, and the area in which the proposed impact is intended, outside of these wooded portions, are cleared open paddock with fragmented vegetation and		

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						scattered large trees. A tree plot survey of the site indicated that the trees within these paddock spaces are largely non-juvenile koala habitat trees (NJKHTs), however surveys indicated the site as containing fragmented ecological values with large portions subject to on-going maintenance for pastoral activities. Furthermore, the majority (77.3%) of the trees recorded within the impact zone were ≤ 300 mm, indicative of the immature and highly disturbed nature of the vegetation here. Connectivity to these scattered vegetation patches is limited, with man-made dams and fragmented open space lacking vegetation removing connectivity to the wooded bushland within the north and east of the site. Further, current industrial buildings and highly traversed roads, Learoyd Road and Gooderham Road, disconnect the sites vegetation to the north and west. Whilst proposed future development and low-density residential areas inhibit connectivity from the fragmented vegetation of the impact area to intact areas of bushland in the south.		

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						Notably, the site adjoins Category C (high value regrowth) and Category B (remnant) vegetation to the north and east of the site in association with the Oxley Creek riparian corridor. The presence of this vegetation increases potential transient Koala to occur within the bounds of the site. However it is unlikely Koala would enter the disturbed open paddock areas of the site due to their inaccessibility and lack of mature NJKHTs. If Koala were to enter the site the area of retained bushland intended for rehabilitation and remaining unimpacted by the development is more likely to provide suitable habitat for the species. According to Queensland Wildnet Data, which dates back to the 1980s, thirty (30) Koalas have been known to occur within a 5 km radius of the site. However, a review of ALA and Biomaps indicated that the majority of these records are over 25 years old. The closest recorded sighting of Koala to the referral area is from 2013 in a small patch of trees adjacent Compton Road 3.5 km east of the site, separated by residential areas, industry and highly traversed roads. More recent records of Koala (within 5 years) are located in Toohey		

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						Forest Conservation Park 5.8 km north of the site and vegetation surrounding Scrubby Creek 7.8km south-east of the site. The site is relatively isolated from these records die to residential and industrial areas, highways and highly urbanized areas. Although the Oxley Creek riparian corridor does allow the possibility for Koala traversal from larger areas of intact vegetation in Glider Forest and Karawatha Forest Park south of the site, the lack of contemporary sightings within these areas indicate a low potential of this occurring. Extensive field surveys of the site, including targeted and incidental, found no evidence of Koala in the form of scats, scratch marks or direct observations within the balance area or the wooded vegetation in the north and east, suggesting Koalas are not utilizing the site. However, the presence of potential habitat in this disturbed woodland and potential connectivity to these vegetated areas of the site suggests a moderate likelihood of occurrence on-site should an opportunistic individual utilize the Oxley Creek riparian corridor to traverse to larger areas of intact bushland.		

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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 tea-trees or melaleucas. A sandy loam soil is also a common feature.	No suitable habitat in the form of coastal heath or wet sclerophyll forest is present on-site. Additionally, the wooded areas on-site adjacent Oxley Creek were not reflective of the dense understory with occasional open areas this species requires for habitat.	Low	Unlikely
Pteropus poliocephalus	Grey-headed Flying-fox (GHFF)	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.	The entire site is mapped as Category X (non-remnant) under the *Vegetation Management Act 1999* (Qld). Field surveys confirmed the presence of potential foraging habitat for the GHFF on-site in the form of fragmented eucalypt woodland within the north and east of the site which contains *Eucalyptus tereticornis* (Forest Red Gum), *E. siderophloia* (Grey Ironbark), *Corymbia intermedia* (Pink Bloodwood) and *Eucalyptus siderophloia* (Grey Ironbark). There are no observed roosts on-site, with the nearest roost located 3.4 km south-east of the site in Parkinson, Avondale Crescent (419), however recent surveys as of 2020 found no flying-foxes at the camp, with numbers dwindling on-site in 2018. The nearest active camp, with Grey Headed Flying Foxes recorded as of 2022, is located 13.2 km west of	Moderate	Low

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						the site in association with Goodna Creek in Redbank (428). There is only one (1) record of the species from 2011 within a 5 km radius of the site according to Queensland WildNet sightings data. This record was within bush land 4 km north-east of the site. Notably, during extensive surveys and spotlighting efforts the species was not observed as a fly over species or utilizing the vegetation during the survey period. Targeted surveys did not detect any GHFF on or in the vicinity of the site. While there have been active roosts within 5 km of the site in previous years, records indicate that these camps are no longer active as of 2020. Furthermore, larger patches of intact bushland are available south of the site in Greenbank Military Base and east in Venman Bushland National Park. These areas offer higher value foraging environment for Grey-headed Flying-fox and are likely to be preferred to the small patch or disturbed woodland found on-site. Nonetheless the majority of this woodland will be retained and rehabilitated as apart of the development		

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						application and therefore remain as foraging habitat should opportunistic individuals enter the site. Due to the lack of recorded sightings in the area and availability of higher quality habitat adjacent the site, there is low likelihood that the species may opportunistically forage on-site.		
Plants								
Arthraxon hispidus	Hairy-joint Grass	V	-	9338	Hairy-joint Grass has been recorded from scattered locations throughout Queensland and on the northern tablelands and north coast of New South Wales. In NSW and QLD, Hairy-joint Grass is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks and swamps. In SEQ, Hairy-joint Grass has also been recorded growing around freshwater springs on coastal foreshore dunes, in shaded small gullies, on creek banks, and on sandy alluvium in creek beds in open forests. The distribution of Hairy-joint Grass overlaps with Semi-evergreen vine thickets of the Brigalow Belt and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland.	Although the site is adjacent to Oxley Creek the vegetation within this area does not represent the habitat preferred by this species and is heavily disturbed. As habitat to support this species does not occur on-site and there are no records of this species within the locality, it is unlikely that this species would occur on-site.	Low	Unlikely

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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 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 altitude. It is commonly associated with *Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photinophylla, Acmena ingens, Diploglottis australis and Diospyros mabacea.*	Rainforest/wet eucalypt forest and the species that the Three-leaved Bosistoa is commonly associated with were not located on site.	Low	Unlikely
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 slopes, depending on the topographic position of the sclerophyll-rainforest margin.	The preferred Regional Ecosystem this species is known to occur in are not present on-site. Recordings of this species on ALA and Biomaps are located over 19 km south of the site, with the most recent being from 2010 and located within preferred Regional Ecosystem community. Due to the highly disturbed state of the site, and absence of suitable habitat, there is a low likelihood that this species would occur.	Low	Unlikely
Cryptocarya foetida	Stinking Cryptocarya	V	V	11976	The Stinking Cryptocarya is restricted to coastal sands, or if not, then close to the coast, occurring in littoral rainforest on old sand dunes and subtropical rainforests over slate	Suitable habitat to support the growth and success of this species was not observed within the assessment area. The lack of associated species and heavy disturbance of	Low	Unlikely

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					and occasionally on basalt to an altitude of 150 m. Associated species include *Syzygium hemilamprum* (Broad-leaved Lilly Pilly), *Acronychia imperforata* (Beach Acronychia), *Cryptocarya triplinervis* (Three-veined Laurel), *Cupaniopsis anacardioides* (Tuckeroo), *Flindersia bennettiana* (Bennet's Ash), *Lophostemon confertus* (Brush Box) and *Syzygium luehmannii* (Small-leaved Lilly Pilly).	the site suggests it's unlikely this species would be supported within the assessment area.		
Cryptostylis hunteriana	Leafless Tongue-orchid	V	-	19533	Leafless tongue-orchid habitats include wet heath, sedgeland, grasstree plains and in woodland with scribbly gum, silvertop ash, red bloodwood and black she-oak.	Although Oxley Creek runs adjacent to the site the vegetation surrounding it is heavily disturbed with this species preferred habitat in the form of sedgeland is not present on-site. There are no local records within the Queensland WildNet sightings data therefore it is unlikely that it would occur on-site.	Low	Unlikely
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. Predominantly 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	Preferred habitat in the form of dry rainforest is not present on-site. There are no local records within the Queensland WildNet sightings data therefore it is unlikely that it would occur on-site.	Low	Unlikely

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					granodiorites, basalt and andesitic flows, and pyroclastics).			
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 disturbed and fragmented environment, especially as its range is thought to be further south than the sites location.	Low	Unlikely
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 WildNet 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	Unlikely
Eucalyptus curtisii	Plunkett Mallee	-	NT	-	A shrubby mallee or slender small tree endemic to south-eastern Queensland occurring sporadically from Plunkett south of Beenleigh west to Inglewood, Dalby and Barakula State Forest and extending as far north as the Glasshouse Mountains area, and inland as far as Isla Gorge near Theodore. The species is only found growing naturally in a restricted area about 60 km south of Brisbane near Plunkett. It normally grows up to 457 m elevation on low	Habitat for this species is not present on-site due to the highly disturbed environment as a result of historic logging and agricultural activities. There are two (2) records of this species within a 5 km radius of site according to ALA sightings data. However, both of these records are over 30 years old and unlikely to be a good indicator of species presence. The entire site was searched, and this species was	Low	Unlikely

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					ridges with good surface drainage. It also occurs on poorly drained lowland sites.	not observed, thus it is unlikely that this species is present on-site.		
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 in the form of vine forest or vine thicket is not present on-site.	Low	Unlikely
Maundia triglochinoides		-	V	-	Grows in swamps, lagoons, dams, channels, creeks or shallow freshwater 30 - 60 cm deep on heavy clay, low nutrients. Populations expand following flood events and contract to more permanent wetlands in times of low rainfall. Associated with wetland species e.g. *Triglochin procerum* (Water Ribbons).	Oxley Creek adjacent the eastern boundary of the site may provide potential habitat for this species. However vegetation surrounding the creek was heavily disturbed by exotic species *Commelina diffusa* (Hairy Commelina), *Eichhormia crassipes* (Common Water Hycinth) and *Spagneticola trilobata* (Singapore Daisy), which inhibit the growth of native and threatened plants. Furthermore, the vegetation within the balance area is highly modified due to historical clearing and pastoral activities with on-going maintenance. The man-made dams within the referral area were dominated by exotic species, *Persicaria lapathifolia* (Pale Knotweed), *Ludwigia peploides* (Water Primrose), *Typha orientalis* (Typha) and *Nymphaea caerulea* (Blue Water Lily).	Moderate	Low

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						According to Queensland Wildnet, three (3) observations of this species are recorded within 5 km of this site. Biomaps indicates that two (2) of these are from 2014, 3km south of the site in Kayannie St Environmental Habitat. As these recordings are not connected to Oxley Creek it is unlikely the species has spread into the area. Given the lack of sightings within the Oxley Creek area and field surveys confirming the absence of potential habitat within the referral area there is a low likelihood this species would occur within the site.		
Gossia gonoclada	Angle-stemmed Myrtle	E	CR	78866	*Gossia gonoclada* is found in lowland riparian rainforest and notophyll vine forest, along permanent watercourses subject to tidal influence. It usually grows below the peak flood level, on steep slopes and at low elevations of 5-50m. It occurs on moderately well drained clay soils, sandy loams and alluvial soils.	Habitat in the form of riparian rainforest or notophyll vine forest is absent from the site. Although Oxley Creek resides adjacent the eastern boundary of the site this portion of the creek is not subject to tidal influence, of which *Gossia gonoclada* is often linked too. Records of this species are absent from the upper portion of the Oxley Creek catchment adjacent the site, instead being more prominent 6km downstream closer to where the creek enters Brisbane River. For these reasons there is a low likelihood this species	Low	Low

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						would inhabit the vegetation on-site or its surrounds.		
Macadamia integrifolia	Macadamia Bush	V	V	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 nor associated vegetation to support this species occurs on-site.	Low	Unlikely
Macadamia tetraphylla	Rough-shelled Bush Nut	V	V	6581	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 in the form of subtropical rainforest or steep slopes were observed throughout the assessment area.	Low	Unlikely
Notelaea ipsviciensis	Cooneana Olive	CE	E	81858	The Cooneana Olive survives as an understorey plant in degraded, eucalypt dominated dry sclerophyll vegetation 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.	While suitable habitat in the form of modified eucalypt woodland is present on-site, it is unlikely to occur as there is only one known population of this species which is 19km west of the referral area.	Low	Unlikely

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Phaius australis	Lesser Swamp-orchid	E	-	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 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*). *P. australis* is associated with several regional ecosystems, including Of Concern RE 8.2.11, Least Concern RE 12.3.5 and Endangered RE 12.3.20. Under the EPBC Act, RE 12.3.20 is listed as being associated with the endangered threatened ecological community (TEC) Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland.	A small area of *Melaleuca quinquenervia* (Broad-leaved Paperbark) is present within the south-western corner of the site however given the historical modification of the area and use for pastoral activities it is unlikely this small area of fragmented paperbark vegetation could support the Lesser Swamp-orchid. Field surveys within the area noted that the understory is dominated by invasive grass and forb species, which inhibit the growth of natives. Furthermore, rainforest characteristics are absent from the site with no Bangalow Palm (*Archontophoenix cunninghamiana*) or Cabbage Tree Palm (*Livistona australis*) recorded within the area. In addition, none of the regional ecosystems the Lesser Swamp-orchid is associated with area mapped on or adjacent to the site (according to current and pre-clear vegetation mapping).	Low	Low
Rhodamnia rubescens	Scrub Turpentine	CE	CE	15763	Known to occur from coastal districts of NSW north from Batemans Bay to Bundaberg in Queensland. The distribution occasionally	Preferred habitat in the form of rainforest is not present on-site. In addition, there are no records of this species within the locality; the	Low	Unlikely

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					extends inland onto the escarpment up to 600 m ASL in areas with rainfall of 1000-1600 mm. Commonly occurs in all rainforest subforms except cool temperate rainforest. Species occupies a range of volcanically derived and sedimentary soils and is a common pioneer species in Eucalypt forests. Often found in wet sclerophyll associations in rainforest transition zones and Creekside riparian associations. Flowers from late winter through spring, with a peak in October and fruits appear in December in the Sydney region. Habitat is likely to include subtropical rainforests, northern warm temperate rainforests, littoral rainforest, for example.	closest being on the banks of the Brisbane River 11km north of the referral area. Thus, it is unlikely that this species would occur on-site.		
Rhodomyrtus psidioides	Native Guava	CE	CE	19162	Known to occur from coastal districts of NSW north from Gosford to Maryborough in Queensland. Occurrence records are typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges. The species flowers in late spring to early summer, producing fruits in summer. Habitat is likely to include subtropical rainforests, warm temperate rainforests, littoral rainforest, and wet sclerophyll forests.	Preferred habitat in the form of rainforest and wet sclerophyll forest is not present on-site. In addition, the one (1) record on ALA of this species within 5 km of this site was sighted in the 1930s, in an area that is now developed and therefore no longer a viable indicator of species presence. No other reports of this species within the locality are recorded, thus it is unlikely that this species would occur on-site.	Low	Unlikely

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
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, 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.	This species favours lowland rainforest or rainforest margins which are absent from the site and the surrounding environment. Furthermore, no local records exist, therefore indicating it is unlikely the species would occur on-site.	Low	Unlikely
Thesium australe	Austral Toadflax	V	V	15202	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.	The open paddock environment on-site is heavily modified and dominated by invasive grass and forb species which have inhibited the growth of native flora. On-going maintenance on-site and historical pastural activities have limited the potential for threatened species to reside within the area. Although associated species *Themeda triandra* (Kangaroo Grass) was recorded on-site, there are no local records within the Queensland WildNet sightings data therefore it is unlikely that it would occur 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.	There are no records within 5 km radius of the site according to the Queensland WildNet sightings data and no rocky outcrops are present within the site. Field surveys found ground cover within the area to be heavily	Low	Unlikely

Scientific name	Common name	Listing Status*		EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of occurrence (on-site)
		EPBC Act	NC Act					
						modified and areas of leaf litter to be largely absent. Therefore it is unlikely that Collared Delma would occur within the proposed impact area.		
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.	The site is outside species' recorded populations range with no records within the local region. Furthermore, field surveys identified no suitable habitat to support this species occurs on-site.	Low	Unlikely

**Status abbreviations are as follows: CE = Critically Endangered, E = Endangered, V = Vulnerable, NT = Near Threatened, C = Least Concern, SL = Special Least Concern, - = Not Listed.*

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						
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	Unlikely
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	Unlikely
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	Unlikely
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	Unlikely
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	Unlikely
	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.	Oxley Creek adjacent the site is heavily modified, lacking the dense and taller woodlands this species prefers. Historical imagery indicates the majority of the site as having been cleared for pastoral activities leaving no	Low	Unlikely

Scientific name	Common name	EPBC code	Description of preferred habitat	Analysis	Desktop Likelihood of occurrence (on-site)	Field Survey Confirmed Likelihood of Occurrence
				suitable habitat to support this species occurs on-site. In addition no records of the species are recorded on Queensland Wildnet as having occurred within a 5km radius of the site.		
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.	According to Biomaps and ALA this species has been recorded within 5 km of the site, however the majority of these records are within higher value and intact bushland such as Karawatha Forest Park south of the site and Toohey Forest Conservation Park north of the site. Preferred habitat for this species was not observed on-site with historical clearing removing potential habitat, therefore there is a low likelihood that this species would occur, with occurrence limited to opportunistic foraging.	Low	Low
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 for this species occurs on-site.	Low	Unlikely
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 for this species occurs on-site.	Low	Unlikely

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 for this species occurs on-site.	Low	Unlikely
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 for this species occurs on-site.	Low	Unlikely
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 for this species occurs on-site.	Low	Unlikely
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 for this species occurs on-site.	Low	Unlikely

Appendix D

Flora and Fauna Species Lists

Flora species list (Native and Introduced)

Scientific Name	**Common Name**
NATIVE	
Acacia concurrens	Black Wattle
Acacia disparrima	Hickory Wattle
Acacia fimbriata	Fringed Wattle
Acacia leiocalyx	Early Flowering Black Wattle
Allocasuarina littoralis	Black She Oak
Alphitonia excelsa	Soap Tree
Amyema sp.	Mistletoe
Angophora leiocarpa	Smooth Barked Apple
Angophora woodsiana	Smudgee Apple
Aristida purpurea	Threeawn aristida
Breynia oblongifolia	Coffee Bush
Calochlaena dubia	Soft Bracken
Capillipedium parviflorum	Scented-top Grass
Cassytha glabella	Devils Twine
Casuarina cunninghamiana	River She-oak
Cayratia clematidea	Slender Grapevine
Cheilanthes distans	Bristle Cloak Fern
Chrysocephalum apiculatum	Yellow Buttons
Corymbia intermedia	Pink Bloodwood
Corymbia tessellaris	Moreton Bay Ash
Cymbidium canaliculatum	Channelled Boat-lip Orchid
Cymbopogon refractus	Barbed Wire Grass
Cynodon dactylon	Common couch
Cyperus difformis	Dirty Dora
Cyperus polystachyos	Bunchy Sedge
Drosera spatulata	Spoon-leaved Sundew
Eleocharis dulcis	Water Chestnut
Eragrostis brownii	Brown's Lovegrass
Eriocaulon scariosum	Hat Pins
Eucalyptus crebra	Narrow-leaved Ironbark
Eucalyptus moluccana	Gum Topped Box

Scientific Name	**Common Name**
Eucalyptus robusta	Swamp Mahogany
Eucalyptus siderophloia	Grey Ironbark
Eucalyptus tereticornis	Forest Red Gum
Fimbristylis velata	A Fringe Rush
Gahnia aspera	Saw Sedge
Geitonoplesium cymosum	Scrambling Lily
Glochidion ferdinandi	Cheese Tree
Glochidion sumatranum	Large-leaved Cheese Tree
Goodenia rotundifolia	Star Goodenia
Grevillea banksii	Red Silky Oak
Imperata cylindrica	Blady Grass
Juncus usitatus	Common Rush
Leersia hexandra	Swamp Ricegrass
Lepironia articulata	Grey Rush
Leptospermum polygalifolium	Wild May
Lobelia purpurascens	White Root
Lomandra longifolia	Long-leaved Matrush
Lophostemon confertus	Brush Box
Lophostemon suaveolens	Swamp Box
Melaleuca linariifolia	Snow-in-summer
Melaleuca quinquenervia	Broad-leaved Paperbark
Melaleuca saligna	Willow Bottlebrush
Murdannia graminea	Slug Herb
Nymphoides indica	Water Snowflakes
Ottelia ovalifolia	Swamp Lily
Ottochloa gracillima	Graceful Grass
Parsonsia straminea	Monkey Rope
Patersonia glabrata	Native Iris
Persicaria decipiens	Slender Knotweed
Philydrum lanuginosum	Woolly Frogmouth
Pimelea linifolia	Rice Flower
Pseuderanthemum variable	Love Flower
Stephania japonica	Tape Vine

Scientific Name	**Common Name**
Themeda triandra	Kangaroo Grass
Wahlenbergia gracilis	Australian Blue Bell
Wahlenbergia graniticola	Bluebell
Velleia spathulata	Wild Panies
EXOTIC	
Ageratum houstonianum	Blue Billygoat Weed
Ambrosia artemisiifolia	Annual Ragweed
Andropogon virginicus	Whiskey Grass
Asparagus aethiopicus	Climbing Asparagus Fern
Asparagus asparagoides	Bridal Creeper
Asparagus falcatus	Sicklethorn
Bidens pilosa	Cobbler's Pegs
Celtis sinensis	Chinese Celtis
Centella asiatica	Pennywort
Chloris gayana	Rhodes Grass
Cinnamomum camphora	Camphor Laurel
Commelina diffusa	Wandering Jew
Corymbia torelliana	Cadaghi
Crotalaria lanceolata	Lance-leaved Rattlepod
Cyperus rotundus	Nutgrass
Echinochloa colona	Awnless Barnyard
Eichhormia crassipes	Common Water Hyacinth
Gomphocarpus physocarpus	Balloon Cotton Bush
Heliotropium amplexicaule	Blue Heliotrope
Ipomoea cairica	Mile-a-minute
Lantana camara	Lantana
Ludwigia longifloia	Primrose Willow
Ludwigia peploides	Water Primrose
Macroptilium atropurpureum	Siratro
Megathyrsus maximus	Guinea Grass
Melinis repens	Red Natal Grass
Nymphaea caerulea	Blue Water Lily
Oxalis corniculata	Creeping Oxalis

Scientific Name	Common Name
Passiflora suberosa	Corky Passion Vine
Pennisetum villosum	Feathertop Grass
Persicaria lapathifolia	Pale Knotweed
Phyllanthus virgatus	Phyllanthus
Salvinia molesta	Salvinia
Schinus terebinthifolia	Broad-leaved Pepper
Sida cordifolia	Flannel Weed
Sida filiformis	Sida
Solanum chrysotrichum	Giant Devil's Fig
Solanum nigrum	Blackberry Nightshade
Solanum seaforthanium	Brazilian Nightshade
Solanum torvum	Devil's Fig
Spagneticola trilobata	Singapore Daisy
Sporobolus jacquemontii	American Rat's Tail Grass
Typha orientalis	Broad-leaved Cumbungi
Ulmus parvifolia	Chinese Elm
Urochloa decumbens	Signal Grass

Fauna species list (Native and introduced)

Scientific Name	**Common Name**
BIRDS	
Artamus leucorynchus	White-breasted Wood swallow
Aquila audax	Wedge-tail Eagle
Cacatua galerita	Sulphur-crested Cockatoo
Cacatua sanguinea	Little Corella
Corvus orru	Torresian Crow
Coturnix ypsilophora	Brown Quail
Dacelo novaeguineae	Laughing Kookaburra
Dicrurus bracteatus	Spangled Drongo
Eopsaltria australis	Eastern Yellow Robin
Gallinula tenebrosa	Dusky Moorhen
Gerygone olivacea	White Throated Gerygone
Gymnorhina tibicen	Australian Magpie
Lichmera indistincta	Brown Honeyeater
Lonchura castaneothorax	Chestnut-breasted Mannikin
Malurus melanocephalus	Red-backed Fairy Wren
Manorina melanocephala	Noisy Minor
Meliphaga lewinii	Lewin's Honey Eater
Merops ornatus	Rainbow Bee-eater
Myzomela sanguinolenta	Scarlet Honeyeater
Rhipidura leucophrys	Willie Wagtail
Strepera graculina	Pied Currawong
Trichoglossus haematodus moluccanus	Rainbow Lorikeet
Vanellus miles	Masked Lapwing
MAMMALS	
Pteropus alecto	Black Flying-fox
Wallabia bicolor	Swamp Wallaby
REPTILES	
Cryptoblepharus virgatus	Wall Skink
Lampropholis delicata	Grass Skink
Physignathus lesueurii	Eastern Water Dragon
Pseudechis porphyriacus	Red-bellied Black Snake

Scientific Name	**Common Name**
AMPHIBIANS	
Litoria fallax	Eastern Sedgefrog
Litoria nasuta	Striped Rocket Frog
INTRODUCED SPECIES	
Rhinella marina	Cane Toad

Appendix E

SAT survey results

SAT 1 – 04.05.2022

Tree #	Species	DBH	Scats (Y/N)
1	*Eucalyptus tereticornis*	350	N
2	*Melaleuca quinquenervia*	230	N
3	*Melaleuca quinquenervia*	190	N
4	*Melaleuca quinquenervia*	160	N
5	*Melaleuca quinquenervia*	180	N
6	*Melaleuca quinquenervia*	270	N
7	*Corymbia intermedia*	150	N
8	*Melaleuca quinquenervia*	220	N
9	*Lophostemon suaveolens*	170	N
10	*Corymbia intermedia*	340	N
11	*Melaleuca quinquenervia*	280	N
12	*Melaleuca quinquenervia*	220	N
13	*Melaleuca quinquenervia*	200	N
14	*Corymbia intermedia*	190	N
15	*Eucalyptus tereticornis*	380	N
16	*Melaleuca quinquenervia*	190	N
17	*Acacia leiocalyx*	140	N
18	*Lophostemon suaveolens*	240	N
19	*Melaleuca quinquenervia*	240	N
20	*Melaleuca quinquenervia*	220	N
21	*Eucalyptus tereticornis*	560	N
22	*Eucalyptus tereticornis*	280	N
23	*Lophostemon suaveolens*	160	N
24	*Eucalyptus tereticornis*	210	N
25	*Corymbia intermedia*	140	N
26	*Melaleuca quinquenervia*	300	N
27	*Lophostemon suaveolens*	180	N
28	*Lophostemon suaveolens*	190	N
29	*Glochidion ferdinandi*	160	N
30	*Lophostemon suaveolens*	100	N

SAT 2 – 04.05.2022

Tree #	Species	DBH	Scats (Y/N)
1	*Eucalyptus siderophloia*	680	N
2	*Corymbia intermedia*	160	N
3	*Corymbia intermedia*	240	N
4	*Acacia leiocalyx*	150	N
5	*Acacia disparrima*	190	N
6	*Eucalyptus siderophloia*	370	N
7	*Corymbia intermedia*	460	N
8	*Corymbia intermedia*	190	N
9	*Melaleuca saligna*	160	N
10	*Corymbia intermedia*	190	N
11	*Eucalyptus siderophloia*	160	N
12	*Lophostemon suaveolens*	150	N
13	*Corymbia intermedia*	200	N
14	*Corymbia intermedia*	170	N
15	*Corymbia intermedia*	130	N
16	*Lophostemon suaveolens*	130	N
17	*Angophora leiocarpa*	140	N
18	*Eucalyptus siderophloia*	210	N
19	*Eucalyptus siderophloia*	140	N
20	*Eucalyptus siderophloia*	190	N
21	*Eucalyptus tereticornis*	200	N
22	*Eucalyptus tereticornis*	220	N
23	*Corymbia intermedia*	210	N
24	*Eucalyptus siderophloia*	140	N
25	*Corymbia intermedia*	150	N
26	*Eucalyptus siderophloia*	260	N
27	*Eucalyptus siderophloia*	250	N
28	*Eucalyptus siderophloia*	220	N
29	*Eucalyptus siderophloia*	180	N
30	*Lophostemon suaveolens*	170	N

SAT 3 – 04.05.2022

Tree #	Species	DBH	Scats (Y/N)
1	*Eucalyptus tereticornis*	180	N
2	*Eucalyptus siderophloia*	220	N
3	*Eucalyptus siderophloia*	630	N
4	*Corymbia intermedia*	460	N
5	*Eucalyptus siderophloia*	190	N
6	*Eucalyptus siderophloia*	180	N
7	*Eucalyptus siderophloia*	140	N
8	*Eucalyptus siderophloia*	160	N
9	*Eucalyptus tereticornis*	150	N
10	*Eucalyptus siderophloia*	200	N
11	*Eucalyptus siderophloia*	180	N
12	*Eucalyptus siderophloia*	140	N
13	*Angophora leiocarpa*	140	N
14	*Eucalyptus siderophloia*	150	N
15	*Angophora leiocarpa*	130	N
16	*Eucalyptus siderophloia*	140	N
17	*Eucalyptus siderophloia*	100	N
18	*Acacia leiocalyx*	120	N
19	*Eucalyptus moluccana*	420	N
20	*Eucalyptus siderophloia*	150	N
21	*Eucalyptus siderophloia*	130	N
22	*Eucalyptus siderophloia*	140	N
23	*Lophostemon confertus*	270	N
24	*Corymbia intermedia*	100	N
25	*Acacia leiocalyx*	110	N
26	*Eucalyptus tereticornis*	460	N
27	*Eucalyptus siderophloia*	520	N
28	*Alphitonia excelsa*	120	N
29	*Acacia disparrima*	300	N
30	*Lophostemon confertus*	170	N

SAT 4 – 04.05.2022

Tree #	Species	DBH	Scats (Y/N)
1	*Eucalyptus tereticornis*	320	N
2	*Acacia leiocalyx*	160	N
3	*Casuarina cunninghamiana*	240	N
4	*Eucalyptus siderophloia*	180	N
5	*Casuarina cunninghamiana*	210	N
6	*Corymbia intermedia*	230	N
7	*Lophostemon suaveolens*	260	N
8	*Alphitonia excelsa*	200	N
9	*Eucalyptus tereticornis*	200	N
10	*Corymbia torelliana*	230	N
11	*Glochidion ferdinandi*	290	N
12	*Acacia disparrima*	210	N
13	*Acacia fimbriata*	100	N
14	*Acacia fimbriata*	130	N
15	*Glochidion ferdinandi*	260	N
16	*Corymbia intermedia*	210	N
17	*Eucalyptus siderophloia*	480	N
18	*Alphitonia excelsa*	160	N
19	*Corymbia intermedia*	220	N
20	*Eucalyptus siderophloia*	450	N
21	*Eucalyptus siderophloia*	400	N
22	*Acacia disparrima*	300	N
23	*Eucalyptus siderophloia*	360	N
24	*Corymbia intermedia*	230	N
25	*Eucalyptus siderophloia*	190	N
26	*Alphitonia excelsa*	120	N
27	*Alphitonia excelsa*	130	N
28	*Eucalyptus siderophloia*	420	N
29	*Eucalyptus siderophloia*	130	N
30	*Angophora leiocarpa*	220	N

Appendix F

Significant Impact Guideline 1.1 Assessment - Koala

Assessment against the Significant Impact Guidelines 1.1 for the Koala

As of 12 February 2022, the EPBC Act referral guidelines for the vulnerable Koala have been redacted following the elevation of the Koala listing status under the EPBC Act to Endangered. As such, the Federal Significant Impact Guidelines are to be utilised in the interim to determine if a significant impact on Koala may occur as a result of the proposed action. The assessment methodology included site surveys and consideration of Commonwealth, State and Local Government environmental database searches.

Significant Impact Assessment

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

Population of a Species

A 'population of a species' is defined by the Significant Impact Guidelines 1.1 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.*

Habitat Critical to the Survival of the Species

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.*

Koala Significant Impact Assessment

Conservation Status – The Koala is listed as Endangered under the EPBC Act.

Description – Koalas (*Phascolarctos cinereus*) are native Australian tree-dwelling marsupials with predominantly grey coloured fur.

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.

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.

Koalas are highly territorial, and individuals maintain their own home range which may overlap with other individuals. 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.

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.

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 10** below.

Table 10 - EPBC Significant impact criteria for critically endangered and endangered species – Koala

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	Despite the referral area being completely mapped as Category X (non-remnant) vegetation as a result of a PMAV (ref: 2006/003251), Non-juvenile Koala Habitat Trees (NJKHTs) are present across the referral area. The site itself has been historically cleared, with large portions subject to on-going maintenance for pastoral activities having only scattered trees remaining and dominated by weeds at the ground level. The northern and eastern peripheries of the site are vegetated with a treed canopy and are also heavily weed infested. Although this woodland is heavily disturbed by invasive species, areas were observed to be dominated by *Eucalyptus tereticornis* (Forest Red Gum) and *Eucalyptus siderophloia* (Grey Ironbark) canopy species. The majority of this wooded area however contained relatively immature eucalypt species, reminiscent of regrowth with scattered canopy *Corymbia intermedia* (Pink Bloodwood), *Angophora leiocarpa* (Smooth-barked Apple), *Eucalyptus siderophloia* (Grey Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum) noted throughout. The development proposes to retain and rehabilitate the northern and eastern portions of the referral area while the impact area is to be located within highly modified paddock areas in the south-west. Vegetation within the impact area contains scattered mature trees and regrowth juvenile species, a relatively dense and isolated stand of *Melaleuca* is present in the south-west corner. Field assessments throughout the referral area did not detect any evidence of Koala. In addition, despite a number of historical recorded sightings of Koala in the local area, there has been only one (1) recent record (within 10 years) within 4 km of the referral area. This individual was sighted 3.5 km west of the referral area within vegetation adjacent the highly traversed Compton Road. Connectivity to this sighting and the vegetation on-site is highly limited as low and high-density residential developments, roads and industry buildings separate the two. Therefore, it is highly unlikely this individual ort others would traverse into the vegetation located on-site. The vegetation within the referral area retains some connectivity value to the north and east associated with Oxley Creek (refer **Plan 1**), which is to be retained as part of the proposed development and rehabilitated in part to mitigate a compliance matter under previous ownership of the land. The retention of this vegetation allows connectivity into larger areas of intact bushland south of the site via Paradise Road Park and into Glider Forest. However, vegetation in the south and west of the site, where the proposed development is intended, offers extremely limited connectivity value as the fragmented environment and scattered trees adjoin large industrial developments which are devoid of vegetation.	**A significant impact is not likely**

Significant Impact Criteria	Assessment	Impact
	It is considered highly unlikely that the removal of vegetation within the south-west portion of the referral area would affect the viability or size of any Koala populations in the area.	
2. Reduce the area of occupancy of the species	Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Koala within the referral area, suggesting the vegetation on-site is not utilised by Koalas. In addition, recorded sightings of the species in the local area are all relatively dated (over ten years) with only one (1) relatively contemporary record in 2013 within 4 km of the referral area. As discussed above, this record is separated from the site by highly urbanised areas and being at 3.5 kms away is on the very edge of the average home range for Koala. While the proposed action will remove potential Koala habitat, the impact area will occupy a highly modified, predominantly cleared portion of the referral area in the south-west. This area contains only scattered mature species and juvenile regrowth which lacks connectivity value due to large industrial developments to the south and west where vegetation has been completely cleared. Connectivity value within the referral area and broader region will be retained and enhanced through rehabilitation efforts of bushland in the north and eastern extent of the referral area associated with Oxley Creek. The impact area lacks suitable habitat and connectivity value and Koala activity was not detected within the referral area, therefore it is anticipated that the removal of vegetation on-site is not considered to reduce the area of occupancy for Koalas.	**A significant impact is not likely**
3. Fragment an existing population into two or more populations	Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Koala within the referral area, suggesting the vegetation on-site is not utilised by Koalas. In addition, recorded sightings of the species in the local area are all relatively dated (over ten years) with only one (1) relatively contemporary record in 2013 within 4 km of the referral area. While the proposed action will remove potential Koala habitat, the impact area will occupy a highly modified, predominantly cleared portion of the referral area in the south-west consisting of low-value, at best ancillary Koala habitat. This area contains only scattered mature species and juvenile regrowth which lacks connectivity value due to large industrial developments to the south and west where vegetation has been completely cleared. Connectivity value within the referral area and broader region will be retained and enhanced through rehabilitation efforts of bushland in the north and eastern extent of the referral area associated with Oxley Creek.	**A significant impact is not likely**

Significant Impact Criteria	Assessment	Impact
	As a result, the removal of vegetation on-site will not exacerbate existing fragmentation of adjoining Koala habitat. The open woodland space north and east of the site is intended to be rehabilitated with areas identified as lacking coverage to undergo supplementary plantings and denser areas to receive assisted natural rehabilitation via the removal of invasive species and overall maintenance of the region. Thus, the proposed action will retain and enhance existing connectivity value within the referral area and broader region. Further, being developed for industrial purposes it is likely that the development impact area will be securely fenced ensuring fauna, including the Koala if present, are restricted to the corridor area and not exposed to potential threats. Therefore, the project is not considered likely to fragment an existing population of the species.	
4. Adversely affect habitat critical to the survival of a species	Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Koala within the referral area, suggesting the vegetation on-site is not utilised by Koalas. In addition, recorded sightings of the species in the local area are all relatively dated (over ten years) with only one (1) relatively contemporary record in 2013 within 4 km of the referral area. The proposed action results in the removal of tree species known to be used by the Koala such as *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus siderophloia* (Grey Ironbark) and *Corymbia intermedia* (Pink Bloodwood). As a collective the habitat is highly disturbed, fragmented and retains no functioning connectivity. While the site does contain habitat potential for Koala, the impact area is located within a highly modified environment in the south-west resulting in the removal of 5.04 ha of vegetation identified as 'Fragment Ancillary Koala Habitat' and 6.71 ha of 'Fragment Paddock'. 10.17 ha of vegetation within the referral area including mostly higher quality Koala habitat is to be retained and rehabilitated in the north and east with only one edge at 0.26 ha to be impacted (refer **Plan 6**). Notably, the north-eastern corner of the impact area will be compensatory cut for flood risk management so will contribute to the riparian corridor and be rehabilitated to augment ongoing connectivity value through the north-east of the referral site. It should be noted that areas of higher quality habitat are relatively disturbed by invasive species, with field surveys finding the vegetation to contain relatively immature eucalypt species, reminiscent of regrowth with scattered large canopy *Corymbia intermedia* (Pink Bloodwood), *Eucalyptus siderophloia* (Grey Ironbark), *Eucalyptus tereticornis* (Forest Red Gum) and *Angophora leiocarpa* (Smooth-barked Apple). However, the retention and rehabilitation of these areas will lead to great habitat quality and connectivity in the future relative to the impact area.	**A significant impact is not likely**

Significant Impact Criteria		Assessment	Impact
		In the absence of a current definition, the overall site does contain habitat that may be classified as critical to the survival of the species, however, impacts are considered relatively minor due to the highly modified and fragmented state of the impact area and the retention and rehabilitation and quality improvement of the highest quality vegetation in the north and east of the site. Therefore, it is anticipated that the proposed development will not have any adverse effect on habitat critical to the survival of the species.	
5.	Disrupt the breeding cycle of a population	Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Koala within the referral area, suggesting the vegetation on-site is not utilised by Koalas In addition, recorded sightings of the species in the local area these are all relatively dated (over ten years) with only one (1) relatively contemporary record in 2013 within 4 km of the referral area. Further, the proposal will retain and rehabilitate connectivity areas along the north and east of the referral site. As a result, it is not considered that the proposed action would disrupt the breeding cycle of a population of Koala as there is a lack of indication of breeding population on-site. And existing fragmentation will be improved.	**A significant impact is not likely**
6.	Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action will impact a portion of the site containing Koala habitat trees. No evidence of Koala in the form of direct sightings or indirectly through scratch marks or scats was detected on-site during targeted surveys nor incidental surveys. As a local Koala population does not utilise the site, it is not considered that the proposed action will impact the habitat on-site to the extent that the species is likely to decline. Additionally, the retention and enhancement of bushland in the north and east of the site will ensure that current and future connectivity through the Oxley Creek riparian corridor is not compromised.	**A significant impact is not likely**
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	The proposed development will add marginally to a surrounding environment known to support a number of major threats to the Koala species including roads and vehicle traffic. A review of Koala hospital records shows that there have historically been 20 recorded incidents involving Koala (i.e deceased, injured, sick or other), refer **Plan 5**, within 5 km of the referral area. The project will not introduce these threats as they already occur within proximity of the referral area and broader landscape. In addition, invasive flora species that may impact the quality of suitable Koala habitat are currently present within the referral area in abundance. The development proposes to rehabilitate the northern and eastern portions of the site with assisted natural rehabilitation, supplementary plantings and removal of invasive species proposed, enhancing the suitability of habitat in this area. Being for industrial development it is likely that the impact area will be securely fenced to ensure a distinct separation between potential threats and the retained rehabilitation area.	**A significant impact is not likely**

Significant Impact Criteria	Assessment	Impact
	The proposed development will not result in the introduction or increase of invasive species that are harmful to the Koala or Koala habitat.	
8. Introduce disease that may cause the species to decline, or	Diseases including chlamydial disease and Koala retrovirus (KoRV) are prevalent among Koala populations in South East Queensland. It is unlikely that the proposed action will introduce or increase the prevalence of disease in Koalas particularly as the action is not considered to impact a local population.	**A significant impact is not likely**
9. Interfere substantially with the recovery of the species.	Detailed studies utilising both direct and indirect survey methods did not detect any evidence of Koala within the referral area, suggesting the vegetation on-site is not utilised by Koalas. In addition, recorded sightings of the species in the local area are all relatively dated (over ten years) with only one (1) elatively contemporary record in 2013 within 4 km of the referral area. The Action is unlikely to interfere substantially with the recovery of the Koala. The removal of low quality, fragmented vegetation in the south-west will only marginally reduce potential available habitat (refer **Plan 6**). In addition, where higher quality habitat and connectivity availability is present, north and east, these areas will be retained and rehabilitated. Therefore, in the low likelihood that a transient individual should enter the site via the Oxley Creek riparian corridor, the vegetation being retained and rehabilitated will facilitate continued safe movement through the environment to areas of larger intact bushland north (Toohey Forest Conservation Park) and south (Glider Forest and Karawatha Forest Park) of the referral area. The vegetation within the impact area is identified as lower quality potential habitat due to the dominance of regrowth vegetation, high level of invasive species and fragmentation and lack of vegetation connectivity reducing the overall suitability of habitat. Refer below for an assessment against the EPBC Act Recovery Plan for the Koala.	**A significant impact is not likely**

The EPBC Act National Recovery Plan for the Koala was published in March 2022. This recovery plan for the listed Koala replaces the National Koala Conservation and Management Strategy (2009-2014) (NRM Ministerial Council 2009). It has been developed with relevant State and Territory Governments to provide an overarching national conservation framework for the listed Koala that aligns with local, state and territory government plans, programs and strategies. However, it does not replace Local, State and Territory Government plans, programs and strategies. It is the first recovery plan for the nationally listed Koala.

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

Three (3) key objectives of the Draft National Recovery Plan are provided below with responses relevant to the proposed action:

1. **The area of occupancy and estimated size of populations that are declining, suspected to be declining, or predicted to decline are instead stabilised and then increased. The area of occupancy and estimated size of populations that are suspected and predicted to be stable are maintained or increased.**

The referral area comprises of entirely no-remnant and highly distributed vegetation. Historical land uses including broadscale clearing have degraded paddock portions of the site and on-site. No Koalas were identified during survey efforts, and no evidence of use was recorded within the referral area.

The proposed action will reduce the potential area of occupancy within this locality through the loss of approximately 12 ha of potential habitat that is already highly fragmented ancillary treed paddock and open paddocks.. However, nearly half of the referral area will be retained and rehabilitated including those areas identified as having greater environmental values. Approximately 10 ha of vegetation will be retained and rehabilitated as habitat and biodiversity corridor, ensuring this vegetation will be available as stepping stones or immediate refuge for wildlife.

The proposed action will not reduce the size of the population. No evidence of Koala activity was recorded, and higher value habitat areas will be retained and rehabilitated for ongoing connectivity value. The proposed action is an extension of the existing industrial uses in the area, and will likely require secure fencing that can facilitate delineation between potential threats and ongoing habitat uses around the impact area and along the Oxley Creek corridor.

Upon completion, the proposed action will improve the potential area of occupancy for the Koala within a well connected and resilient habitat area bordering the impact and the Oxley Creek riparian area.

2. **Metapopulation processes are maintained of improved**

No evidence of Koala activity was recorded on-site, and there are limited contemporary records in the local area.

The referral area is surrounded by industrial development to the south and west, with habitat absent and threats present. To ensure no native fauna are fragmented by the referral proposed action, the retention of and rehabilitation of vegetation for a biodiversity corridor along Oxley Creek is proposed. The development of the referral area will ensure the retention of habitat and biodiversity corridors to reduce threats and maintain genetic diversity within the local area.

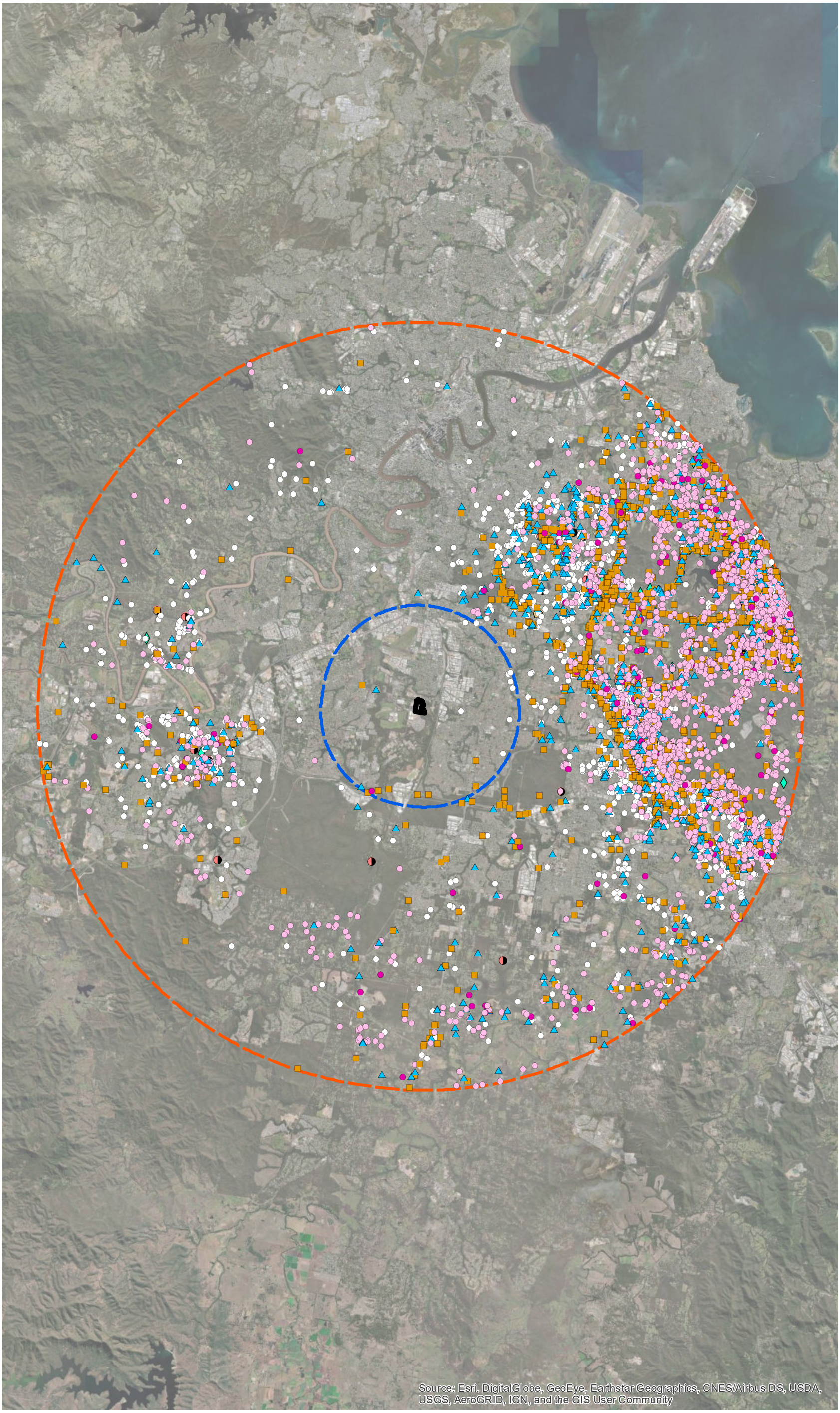
3. Partners, communities and individuals have a greater role and capability in listed Koala monitoring, conservation and management

No evidence of Koala activity was recorded on-site, and there are limited contemporary records in the local area.

Low vehicle speeds and slow points are inherent in industrial development, minimising the risk of vehicle strike. Further, it is likely that security fencing will provide a clear distinction between retained habitat and the development zone to help minimise threats should Koala utilise the area.

Although the proposed action will involve the removal of potential Koala habitat, the potential for a significant impact is mitigated by focusing development to the highly fragmented and disturbed portions of the site, and retaining and rehabilitating the northern and eastern portions for ongoing habitat and connectivity value.

5. Koala Hospital Records



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

- Site DCDB
- Site 20km Buffer
- Site 5km Buffer

Qld Koala hospital records (all)

- Deceased - 1677
- Injured - 1103
- Sick and/or wasted - 3053
- Sick & Injured - 197
- Orphaned - 48
- Fall & orphaned - 1
- Vehicle hit - 33
- Vehicle hit & orphaned - 1
- Other incident type/category not recorded - 2931

Issue	Date	Description	Drawn	Checked
A	27/05/2022	Preliminary	LS	LB

0 2,300 4,600 6,900 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:200,000 @ A3

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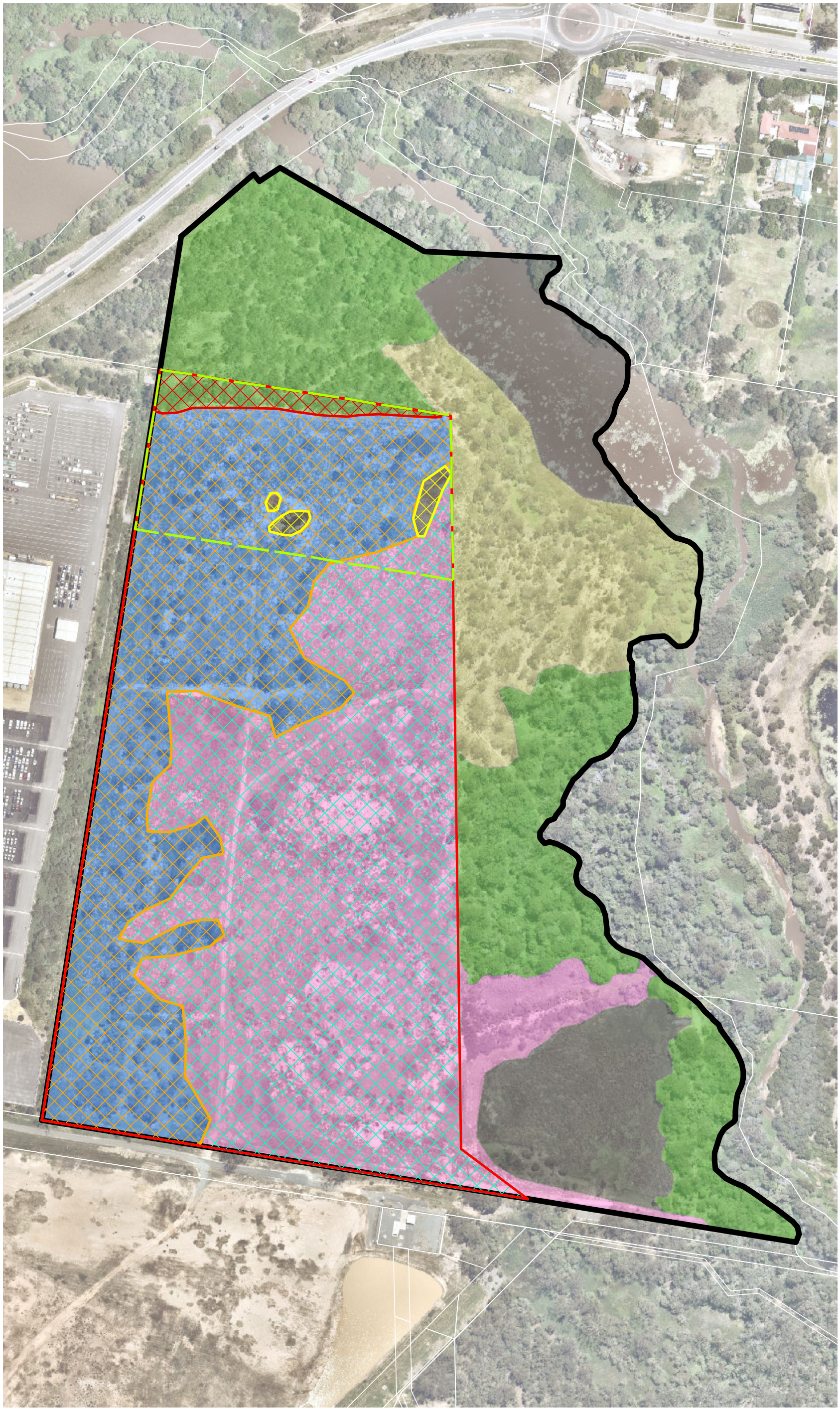
Stockland

108 Burnman Road, Willawong

Address / RPD: 1RP188299

27/05/2022 | 9573 E 05 Koala Hospital A

6. Koala Habitat Impact



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Legend

- Qld DCDB
- Site DCDB - 22.27ha
- Development Footprint -12.10 ha
- Easement 2 – Compensatory Earthworks Rehabilitation Area

Vegetation Community

- 1 - Higher Quality Koala Habitat
- 2 - Disturbed Koala Habitat
- 3 - Fragmented Ancillary Koala Habitat
- 4 - Fragmented Paddock
- 5 - Dams/Waterbodies

Vegetation Community Impacts

- Impacted Higher Quality Koala Habitat - 0.26 ha
- Impacted Fragmented Ancillary Koala Habitat - 5.04 ha
- Impacted Dams/Waterbodies - 0.09 ha
- Impacted Fragmented Paddock 6.71ha

Issue	Date	Description	Drawn	Checked
A	16/06/2022	Preliminary	LS	LB

0 20 40 60 m

Transverse Mercator | GDA 1994 | Zone 56 | 1:2,500 @ A3

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