ENVIRONMENTAL

DETAILED ECOLOGICAL ASSESSMENT

12, 18 & 26 Cloverdale Road, Doolandella 4077

Client: Nexus Urban Consulting
Reference: S521210DEA001v1.0
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Version	Description	Date	Author	Reviewer	Approver
1.0	Draft	4 April 2022	RG (Ecologist)	CH (Ecologist)	RS (Director)

Abbreviations

BCC	Brisbane City Council
BONN	*Convention on the Conservation of Migratory Species of Wild Animals 1991* (or the *BONN Convention*)
CAMBA	*China/Australia Migratory Bird Agreement 1988*
CE	Critically Endangered
Cwlth	Commonwealth
DBH	Diameter at Breast Height
DES	Department of Environment and Science (Qld)
DNRME	Department of Natural Resources, Mines and Energy (Qld)
DAWE	Department of the Agriculture, Water and Environment (Cwlth)
DSDMIP	Department of State Development, Manufacturing, Infrastructure and Planning (Qld)
E	Endangered
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EVNT	Endangered, Vulnerable and Near Threatened
JAMBA	*Japan/Australia Migratory Bird Agreement 1981*
KHA	Koala Habitat Area
km	Kilometre
M	Migratory
m	Meter
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
MLES	Matters of Local Environmental Significance
NC ACT	*Nature Conservation Act 1992* (Qld)
NT	Near Threatened
RE	Regional Ecosystem
PR	*Planning Regulation 2017*
ROKAMBA	*Republic of Korea Migratory Bird Agreement 2007*
QH	Queensland Herbarium
QLD	Queensland
SARA	State Assessment and Referral Agency (Qld)
SPP	State Planning Policy
V	Vulnerable
VM ACT	*Vegetation Management Act 1999* (Qld)

1.0 INTRODUCTION

S5 Environmental was commissioned by Nexus Urban Consulting on behalf of their clients, Qld International Investments to undertake a Detailed Ecological Assessment to support a change in a development application for a 1 into 3 residential development to a 3 into 42 residential subdivision at 26 Cloverdale Road, Doolandella, refer to Table 1.

This report investigates the ecological values, features and functionality of the site in the context of the local and regional area and applicable ecological constraints. Further, this report investigates the presence and/or absence of *Nature Conservation Act 1992* (NC Act) and *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed species and matters, and ecological corridor connectivity across the site and regional surrounds.

Table 1 Site Description

Street Address	12, 18 & 26 Cloverdale Rd, Doolandella 4077	Lot on Plan	Lot 101 on RP90234 Lot 102 on RP90234 Lot 103 on RP90234
LGA	Brisbane City Council (BCC)	Area	23,143 m^2 22,764 m^2 17,452 m^2
Zone	Emerging Community	Tenure	Freehold
Neighbourhood Plan	Doolandella Neighbourhood Plan	Coordinates	-27.6211, 152.9837
Current State	Lot 101, 102 and 103 on RP90234, herein referred to as the 'subject site' is currently zoned as an Emerging Community Zone under the BCC (refer Figure 1). The subject site currently contains several dwellings and sheds located at the front of each property facing onto Cloverdale Road. Lot 101 furthermore contains a shipping container and derelict pool south of the dwelling, and pond on the shared boundary with Lot 102. South of the dwellings, the subject site opens into paddocks which extend south into the site. The paddocks extend to a creek running north-west to south-east through the centre of the site. Lot 102 contains a driveway which continues south through to the end of the paddocks, whilst Lot 103 contains what presumably was once cattle mustering facilities within its paddock. Dense vegetation continues south through the remainder of the site following on from the creek. A pocket of rehabilitation work has recently been undertaken immediately south of the driveways end, continuing approximately 50 meters into the dense vegetation (refer Figure 2).		
Proposal	A 3 into 40 lot subdivision is proposed over the subject sites. The additional lots will be situated within the northern half of the site and will achieve access via a New Road proposed to connect to Cloverdale Road. A stormwater channel (and culvert crossing at the entrance road) are proposed along the northern boundary through lots 1 to 3, along the western boundary through Lots 35 to 40, then south-east through Lots 29		

to 34 to a bioretention basin, which borders the eastern boundary. A bushfire covenant is also proposed along the western most extent of Lots 35 to 40 and southern extent of Lots 25 to 34. The balance of the site is to be dedicated as an Environmental Protection Zone (EPZ). Refer to Figure 3, below.

Figure 1 Site Aerial

Source: Nearmap, Date: 26/08/2021

Figure 2 Council Enforced Restoration Area within the subject site

Figure 3 Extract of Proposed Development

2.0 RELEVANT LEGISLATION

A review was conducted on the regulatory framework applicable to the project. The review confirmed that all activities within the site must comply with the relevant provisions of Commonwealth, State and Local Legislation, Regulations and Guidelines shown in Table 2.

Table 2 Ecologically Relevant Legislation Applicable to the Proposed Development

Legislation/Policy	Matters	Relevance to the proposed development
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	Matters of National Environmental Significance (MNES)	Applicable
Planning Regulation 2017 (Planning Regulation)	Koala habitat	Applicable
	Native (regulated) vegetation	Exempt clearing work
Nature Conservation Act 1992 (NC Act)	Breeding places	Applicable
	Protected animals	
	Protected plants	
Biosecurity Act 2014 (Biosecurity Act)	Prohibited and restricted matters	Applicable
State Planning Policy (SPP)	Biodiversity	Integrated by BCC
	Natural hazards (bushfire)	Applicable
Brisbane City Council Planning Scheme (the planning scheme)	Biodiversity Areas	Applicable
	Bushfire	
	Waterway Corridors	
Natural Assets Local Law (NALL) 2003	SUV, SNV, WWV	Applicable

2.1 Federal Legislative Overview

2.1.1 *Environment Protection and Biodiversity Conservation Act 1999*

The EPBC Act provides a legislative framework to protect and manage nationally and internationally significant matters. The EBPC Act defines these as Matters of National Environmental Significance (MNES).

Nationally significant matters protected under the EPBC Act include national heritage properties, the Great Barrier Reef Marine Park, Commonwealth Marine Areas, Threatened Ecological Communities (TECs), and nationally threatened flora and fauna species.

Internationally significant matters protected under the EPBC Act include world heritage properties, wetlands of international importance, and migratory species. Wetlands of international importance are identified in the *Ramsar Convention on Wetlands* and migratory species listed in the following agreements:

- *China-Australia Migratory Bird Agreement* (CAMBA)*;*
- *Japan-Australia Migratory Bird Agreement* (JAMBA);
- *Republic of Korea-Australia Migratory Bird Agreement* (ROKAMBA);
- *The Convention on the Conservation of Migratory Species of Wild Animals* (CMS or the Bonn Convention); and
- *Agreement on the Conservation of Albatrosses and Petrels* (ACAP).

Under the EPBC Act, a 'self-assessment' is required to ascertain whether an action requires a referral to the Department of the Agriculture, Water and Environment (DAWE) for a significant impact to a MNES. The EPBC Act Policy Statement 1.1, the 'Significant Impact Guidelines' lists assessment criteria for each MNES to assist in determining whether an action is likely to have a significant impact on a MNES.

The Queensland Government provides a framework of legislation to ensure the protection of Queensland's environment, land, water and natural resources. The sections below discuss legislation relevant to ecological constraints for the proposed development.

2.2 State Legislative Overview

2.2.1 *Planning Regulation 2017*

2.2.1.1 Koala Habitat

In February 2020, the State Government implemented new Koala Habitat Mapping which maps the following areas: Koala Priority Areas (KPA), Core Koala Habitat Areas (KHA), Locally Refined Koala Habitat Areas (LRKHA), Koala Habitat Restoration Areas (KHRA) and Identified Koala Broad-Hectare Area (IKBHA). Required assessments in relation to this legislation are summarised below.

Unless the proposed development is listed as exempted development in Schedule 24 of the Planning Regulation, the following applies. When the proposed development site is:

- Inside a KPA and contains Koala Habitat (KHA and/or LRKHA):
  - and interference with Koala Habitat is proposed, the development is prohibited;
  - and interference with Koala Habitat is not proposed, the assessment benchmarks under Schedule 11, Part 2, Section 4 of the Planning Regulation apply;
- Inside a KPA and no Koala Habitat on the premises, no assessment under the Planning Regulation 2017 in relation to Koala Habitat is required;
- Outside a KPA and contains Koala Habitat (KHA and/or LRKHA):
  - and interference with Koala Habitat is proposed, referral to SARA and assessment against SDAP Code 25 is required;
  - and interference with Koala Habitat is not proposed, no assessment under the Planning Regulation 2017 in relation to Koala Habitat is required;
- Inside an IKBHA and the proposed development is assessable development, the assessment benchmarks under Schedule 11, Part 3, Section 6 apply.

2.2.1.2 Native (Regulated) Vegetation

The *Vegetation Management Act 1999* (VM Act) and the *Vegetation Management Framework Amendment Act 2013* provides a legislative framework that aims to regulate the clearing of vegetation in a way that protects remnant vegetation (identified on a regulated vegetation map) and vegetation in declared areas, ensures clearing does not cause land degradation, prevents the loss of biodiversity, maintains ecological processes, manages the environmental effects of clearing, reduces greenhouse gas emissions and allows for sustainable land use. Provided an accepted development vegetation clearing code applies to the proposed vegetation clearing and the clearing complies with that code, the works are accepted development under the Planning Regulation.

Regulated vegetation maps regulated vegetation map can be generated from the Department of Resources website assist in determining the type of approval required for vegetation clearing that is not exempted or accepted development by categorising vegetation under five categories, namely:

- Category A (Vegetation offsets/compliance notices/VDecs);
- Category B (Remnant vegetation);
- Category C (High-value regrowth);
- Category R (Reef regrowth watercourse vegetation); and
- Category X (Exempt clearing work on Freehold, Indigenous and Leasehold land).

Remnant vegetation and high value regrowth are assessed using the Regional Ecosystem (RE) framework and REs are described in the Regional Ecosystem Description Database (REDD). REs can also be representative of TECs and this framework can assist in determining the presence of TECs.

The VM Act also protects areas known as essential habitat. Essential habitat is habitat in which NC Act listed fauna species are known to occur and is identified on a Vegetation Management Supporting Map shown on a Vegetation Management Report.

Any clearing of native vegetation approved for the proposed development would constitute Exempt Clearing Work under Schedule 21, Part 1, Section 1(1) and as such, an operational works permit from the State is not required. However, this report discusses and provides comment on regulated vegetation as mapped by the State.

2.2.2 *Nature Conservation Act 1992*

The *Nature Conservation Act 1992 (*NC Act) is the legislative foundation for the creation and management of protected areas in Queensland, namely national parks, conservation parks, resources reserves, nature refuges, coordinated conservation areas, wilderness areas, world heritage management areas and international agreement areas. Further, the NC Act also ensures that native fauna and native flora are protected outside of protected areas.

2.2.2.1 Breeding Places

All breeding places for native fauna are protected under the NC Act. Where interference with breeding places for protected fauna are/is proposed, DES require a Species Management Programme (SMP) to be submitted and approved to manage potential impacts to protected fauna prior to works being undertaken. There are two types of SMPs; namely high risk and low risk SMPs.

A high risk SMP is required if tampering with a breeding place is proposed for fauna that are:

- prescribed as extinct in the wild, endangered, vulnerable, near threatened, or special least concern fauna under the Nature Conservation (Wildlife) Regulation 2006 (NC Reg), and/or
- prescribed as least concern fauna under the NC Reg and are colonial breeders.

A low risk SMP is required if tampering with a breeding place is proposed for all other native fauna prescribed as least concern under the NC Reg.

Breeding places may be identified during pre-clearance surveys and/or during clearing activities. Regardless of the timing of breeding place detection/identification, the above requirements apply.

It should be noted that it is also an industry standard for clearing to be undertaken under the supervision of, and after an initial site assessment, by a fauna spotter.

2.2.2.2 Protected Animals

The *Nature Conservation (Animals) Regulation 2020* is subordinate legislation under the NC Act that prescribes the protection status of wildlife in Queensland. Protected animals are any fauna listed as Endangered, Vulnerable, Near Threatened, Special Least Concern, and Least Concern species.

2.2.2.3 Protected Plants

The *Nature Conservation (Plants) Regulation 2020* regulates activities that propose to interfere with protected plants in Queensland. The Department of Environment and Science (DES) has incorporated a risk-based approach to requirements for clearing permits for the removal of protected plants. A flora survey trigger map identifies areas of high risk where endangered, vulnerable or near threatened native plants are present or are likely to be present. Vegetation clearing proposed within a mapped high risk area requires a flora survey to be undertaken by a Suitably Qualified Person in accordance with the flora survey guidelines. If no threatened or near threatened plants listed under the NC Plants Regulation are identified during the flora survey, a clearing permit is not required following submission of the flora survey report and exempt clearing notification to the Department of Environment and Science. However, if threatened and near threatened plants are identified during the flora survey and no exemptions apply to the proposed works, a protected plant clearing permit is required. It is important to note that if protected plant/s are identified during clearing works, works must cease and advice sought regarding obtaining a protected plant clearing permit immediately.

2.2.3 *Biosecurity Act 2014*

The *Biosecurity Act 2014* is intended to control the spread of pest species, both plant and animal. There is a General Biosecurity Obligation (GBO) under the Biosecurity Act to ensure works do not spread a pest, disease or contaminant issue and to:

- take all reasonable and practical steps to prevent or minimise each biosecurity risk;
- minimise the likelihood of the risk causing a biosecurity event and limit the consequences of such an event; and
- prevent or minimise the adverse effects the risk could have and refrain from doing anything that might make harmful effects worse.

Under the Biosecurity Act, pests are declared as follows:

- Prohibited Matter - a disease, exotic fish, insect pest, pest animal or a weed that is not found in Queensland. If it was to enter Queensland it would seriously impact our health, way of life, the economy, and the environment. If you find prohibited matter you must report it to Biosecurity Queensland within 24 hours; and
- Restricted Matter - can be an animal disease, noxious fish, insects, pest animal or weed that is found in Queensland. Specific actions are required to be taken that limit the impact of this matter by reducing, controlling or containing it.

Should any Prohibited or Restricted weeds, or pests, be identified on site, they must be addressed in accordance with the above requirements of the *Biosecurity Act*. Invasive species recorded as part of this Detailed Ecological Assessment are outlined in Appendix D and E and Section 5.4.

In addition, the Department of Agriculture and Fisheries' Fire Ant Biosecurity Map outlines suburbs and localities which are in Biosecurity Zones for Red Imported Fire Ants.

It is noted that some animals, such as cane toads and Indian mynas are non-declared pest species as they are already widespread and/or there are no effective control measures available. While there is no legal requirement for control of these pests, everyone has a General Biosecurity Obligation (GBO) to take reasonable and practical steps to minimise the risks associated with invasive pests under their control.

2.2.4 State Planning Policy

The SPP ensures the State's interests in planning are protected through Local Government Planning Schemes. The SPP is used by Local Governments in cases where State Interests have not been fully integrated into local planning schemes. S5 Environmental understands that the SPP ecologically related State Interests have been fully incorporated into the BCC City Plan 2014 (V22) and as such, do not require assessment for the proposed development. The SPP Natural Hazards Risk and Resilience (Bushfire Prone Areas) has not been fully incorporated into the BCC City Plan 2014 (V22) and as such, requires assessment for the proposed development.

2.3 Local Legislative Overview

2.3.1 Brisbane City Council Planning Scheme

As the proposed development is impact assessable, S5 Environmental understands that assessment against the planning scheme is required.

Under the BCC Planning Scheme, environmentally relevant outcomes relevant to the proposed development include:

- Conservation, consolidation, connection and restoration of the network of lands with in-situ values or areas of strategic biodiversity value within Brisbane.
- Protection and enhancement of waterways and foreshores with significant biodiversity values.

- Protection, enhancement and restoration of koala habitat and the facilitation of safe koala movement to assist in the long-term retention of a viable koala population within South East Queensland.
- Protection and enhancement of wetlands with significant biodiversity values and their hydrological value and water-cleaning functions.
- Avoidance of impacts to biodiversity values, ecological features and ecological processes through the placement of development within a development footprint plan.
- All reasonable on-site measures to avoid and mitigate impacts on biodiversity values from the development have been, or will be, undertaken.
- Provision for environmental offsets that achieve an equivalent environmental outcome, where development will or is likely to have a significant residual impact on matters of local environmental significance or matters of State environmental significance.

Ecologically relevant overlays applicable to the proposed development include the Biodiversity Areas Overlay (see Appendix B), Waterway Corridors Overlay and the Bushfire Overlay. S5 Environmental understand that a separate Bushfire Hazard Assessment and Management Plan has been prepared to address bushfire risk to the proposed lots.

2.3.2 Natural Assets Local Law 2003 (NALL)

Natural Assets Local Law 2003 (NALL) defines four categories of protected vegetation. These categories identify the type of vegetation protected and the location of the vegetation:

- Council Vegetation;
- Waterway and Wetland Vegetation;
- Significant Native Vegetation; and
- Significant Urban Vegetation.

3.0 METHODOLOGY

The intent of this report is to provide an informed assessment of the ecological values that are present and/or likely to be present on the site. This report also provides an assessment of the site's habitat and biodiversity values and ecological functionality. In the preparation of this assessment, the following steps were undertaken:

1. Legislation and planning review;
2. Desktop assessment;
3. Field survey;
4. Impact assessment and development analysis; and
5. Conclusions and recommendations.

3.1 Desktop Assessment

Desktop searches were reviewed prior to the field assessment to inform a targeted search for threatened species and ecological communities that could potentially occur on the site. Desktop searches covered the following databases and mapping sources:

- Databases (Search of 1 km radius; Appendix A):
  - Department of the Agriculture, Water and Environment (2021), EPBC Act Protected Matters Search Tool;
  - Queensland Government (2021), Wildnet Online Extract, *Nature Conservation Act 1992*;
- State Mapping (Appendix A):
  - Queensland Government (2021a), Fire ant biosecurity zone mapping – Version 1;
  - Queensland Government (2021b), Request a vegetation map or property report;
  - Department of State Development, Manufacturing, Infrastructure and Planning (2021), Online mapping system which incorporates the State Planning Policy (SPP) Interactive Mapping System (IMS), and the Development Assessment Mapping System (DAMS); and,
- Local Government Area Mapping (Appendix B):
  - Brisbane City Council (2020) Planning Scheme Online Maps.

The likelihood of each EPBC Act and NC Act listed species occurring on site was assessed using the results of the desktop assessment and these species were targeted in fieldwork.

In addition, aerial photography was utilised to discern potential wildlife movement corridors and regional ecological function of the locality. The online resource 'Atlas of Living Australia' (ALA, 2021) was also utilised to gather information on potential flora and fauna at the site.

3.2 Field Assessment

A detailed site inspection of the development site was conducted by S5 Environmental Ecologists on the 3rd of November 2021. Weather was cool and humid, with persistent cloud cover, intermittent showers and a minimum temperature of 16.3◦C and a maximum temperature of 25.1 ◦C, as recorded at Archerfield (Archerfield, Station No. 140211). Rainfall from the week prior to the field survey totalled 48.4mm as recorded at Archerfield (Archerfield, Station No. 140211).

For the ecological assessment, the 'random meander' technique (Cropper, 1993) was used to traverse the site. A measured walkover of the site was achieved with focus on the area within and adjacent to the proposed development footprint. Flora and fauna species were recorded as they were encountered. Vegetation communities were inspected to assess their structure, dominance, associations and function. The structure, health, and integrity of the ecosystems within the site were also assessed and documented.

Areas, or niches, displaying habitat value were closely examined. This included habitat trees and areas of woody debris that may shelter reptiles. Signs of faunal activity, including tree scratches, nests, dreys, scats, tracks, dens and diggings were also searched for and recorded. These traces were interpreted using Triggs (2008). The ecological intactness of land neighbouring the site was broadly investigated as part of the assessment.

Site habitats were assessed to determine their value for native fauna species, including significant and threatened species. Particular attention was given to habitat features including:

- The presence of hollows, fissures and tubes in mature trees suitable as nesting/roosting sites, as well as arboreal and ground-based nests, dreys or burrows;
- The presence of significant habitat trees;
- The presence of arboreal fauna, scratch markings, orts and scats;
- The presence of characteristic feeding signs, for example, diggings (terrestrial mammals), and sap feeding scars on eucalypts (Gliders);
- The presence/abundance of dense vegetation, logs, leaf litter and fallen timber; (small bush birds and reptiles);
- Floristic diversity, including diversity and abundance of fruiting and flowering species; and
- Vegetation connectivity.

A nocturnal fauna assessment has not been performed as part of this assessment.

3.2.1 Survey Limitations

It should be noted that the survey undertaken as part of this Detailed Ecological Assessment only represents a 'snapshot' in time and therefore, may not provide a true indication of vegetation species presence within the subject site. The ability to accurately identify plants to species level can be significantly affected by numerous factors including the timing of a survey (the season), prevailing climatic conditions and the presence of reproductive material (flowers, fruit and seed capsules).

Whilst every effort has been made to detect and accurately identify these species, this survey should not be regarded as conclusive evidence that certain species including listed and protected plants do not occur within the subject site and surrounds.

3.3 Likelihood of Occurrence and Impact Assessment

Results obtained from the desktop and field assessment inform the assessment of the likelihood that the proposed development will have a significant (residual) impact on any MNES, MSES or MLES. Species records, state and local mapping and habitat on site are considered to determine the likelihood of MNES, MSES and MLES occurring within the subject site. Table 3 outlines the definitions of each described likelihood of occurrence. Impacts to any matters (national, state and/or local) that are considered to be likely or have been confirmed on site are assessed in the context of the proposed works and inform recommendations.

Table 3 Likelihood of Occurrence Definitions

Likelihood	Definition
Confirmed	• Identified by S5 Environmental Ecologist/Environmental Planner during site inspection.
Likely	• Suitable habitat present; and • Occurrence records in vicinity since 2000 (WO, ALA).
Possible	• Suitable/marginal habitat present and no occurrence records since 2000; or • Occurrence records in vicinity since 2000 and no suitable/marginal habitat present.
Unlikely	• Unsuitable habitat on site and no sightings since 2000.

4.0 DESKTOP ASSESSMENT RESULTS

Results of the desktop assessment are provided in **Appendix A** and summarised in the sections below.

4.1 Wetlands of International Significance

The site is located within 20-30km of a Ramsar wetland, namely Moreton Bay.

4.2 Vegetation Communities

4.2.1 Threatened Ecological Communities

The PMST report indicated that five threatened ecological Communities (TECs) may occur within the area (refer to **Table 4**).

Table 4 Summary of EPBC ACT Threatened Ecological Communities identified as possibly occurring on site

Threatened Ecological Community	Related REs	EPBC Act Status
Coastal swamp oak (*Casuarina glauca*) forest of NSW and south-east QLD	12.1.1 and 12.3.20	Endangered
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	12.2.7, 12.3.4/12.3.4a, 12.3.5, 12.3.6 and 12.3.20	Endangered
Lowland rainforest of subtropical Australia	12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.11.1, 12.11.10, 12.12.1 and 12.12.16	Critically endangered
Poplar Box Grassy Woodland on Alluvial Plains	12.3.10	Endangered
White Box - Yellow Box - Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands	12.8.16	Critically endangered

4.2.2 Native (Regulated) Vegetation

Current regulated vegetation mapping indicates that the site supports Category B remnant vegetation within the southern half of the site, refer to **Figure 4**. A small pocket of Category C High-value regrowth vegetation is located within the north-western corner of site. The remainder of the site contains non-remnant vegetation mapped as Category X. See **Table 5**.

Table 5 Summary of Mapped Regulated Vegetation Present within the site

RE	VM ACT Status	Category	Area (ha)	Description in REDD
12.3.7	Least Concern	B	1.22	*Eucalyptus tereticornis*, *Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca spp.* fringing woodland.

12.5.3a	Endangered	B / C	1.169	*Corymbia intermedia*, *Eucalyptus seeana* +/- *E. racemosa*, *Angophora leiocarpa* open-woodland on remnant tertiary surfaces occurring mainly to the south of Brisbane.
Non-remnant	N/A	X	2.92	N/A

Figure 4 Regulated Vegetation Mapping

Source: Regulated Regional Ecosystem Mapping - Qld Spatial; Aerial Imagery - Queensland Globe (dated November 2021).

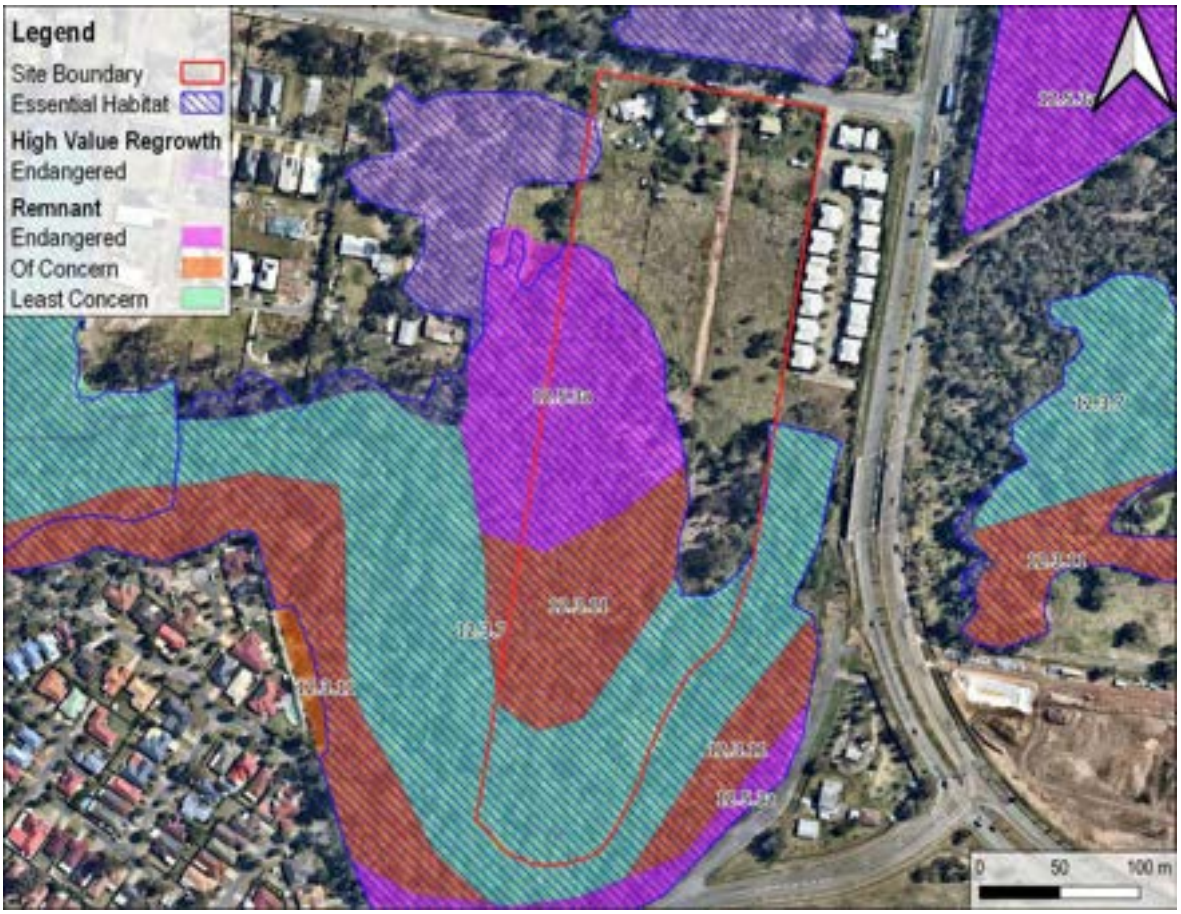

Figure 5 Vegetation Management Supporting Map

Source: Regulated Regional Ecosystem Mapping - Qld Spatial; Aerial Imagery - Queensland Globe (dated November 2021).

4.2.3 Essential Habitat

The site is predominantly mapped as both Category B (Remnant Vegetation) and Category X vegetation (see Figure 4). A pocket of Category C (High-Value Regrowth) is located within the north-western corner of the site. Essential Habitat for the koala (*Phascolarctos cinereus*) is further mapped over the aforementioned Category B and C vegetation (see Figure 5 and Appendix B).

4.2.4 Koala Habitat (Planning Regulation)

State koala habitat mapping shows the site:

- is outside a Koala Priority Area;
- is outside an Identified Koala Broad-Hectare Area; and
- contains Koala Habitat mapping, specifically core koala habitat areas.

The area mapped as Category C Regrowth Vegetation (see Figure 4) is also mapped as Core K Habitat Area (see Figure 6 and Appendix B).

Figure 6 Koala Habitat Mapping (State)

Source: Koala Habitat Mapping - Qld Spatial; Aerial Imagery - Queensland Globe (dated November 2021).

4.2.5 Biodiversity Areas Overlay

Under the Brisbane City Council's Biodiversity Areas Overlay, the vegetation which encompasses approximately the southern two-thirds of the site is mapped as High Ecological Significance (HES) vegetation. Additionally, two pockets of vegetation mapped as High Ecological Significance Strategic (HESS) are located near the middle and the north-western corner of the property. Finally, the entire property is mapped by Council as Koala Habitat Area. See Figure 7.

Figure 7 Environmental Areas Overlay mapping

Source: Environmental Areas Overlay *Brisbane City Plan 2014* - Qld Spatial; Aerial Imagery - Queensland Globe (dated November 2021).

4.2.6 Waterway Corridors Overlay

Under *Brisbane City Plan 2014*, two waterways are mapped passing through the site (refer Figure 8). The first, a local waterway, flows from the north-west corner through the centre of the site to the south-east, into Blunder Creek, a citywide waterway corridor, which flows along the southern boundary and the south-eastern corner of the site. The development appears to overlap with the mapped local waterway and will need to comply with Section A and C of the Waterway Corridors Overlay code within the *Brisbane City Plan 2014*.

Figure 8 Waterway Corridors Overlay Mapping

Source: Waterway Corridors Overlay *Brisbane City Plan 2014* - Qld Spatial; Aerial Imagery - Queensland Globe (dated November 2021).

4.2.7 Natural Assets Local Law (NALL)

A search of Council's NALL Mapping search portal determined that the subject site was mapped to contain Significant Native Vegetation, Significant Urban Vegetation and Waterway and Wetland Vegetation. Refer Figure 9 and Table 6 below. A NALL permit will be required prior to commencement of clearing works.

Table 6 Summary of NALL Mapping

Category	Brief Description	Assessment
Significant Native Vegetation (SNV)	All native vegetation in areas mapped as Significant Native Vegetation is protected under the NALL. Significant native vegetation includes native vegetation, from small ground covers and native grasses to large trees.	• SNV and SUV mapped over entire site • WWCV mapped through the center of the site, and along the southern boundary • NALL permit will be required
Significant Urban Vegetation (SUV)	This category protects vegetation, both native and exotic, on private property that is generally mature and/or prominent in the landscape, or has specific historical or cultural value in Brisbane. Vegetation protected under this category may also preserve biodiversity values and natural landforms. Significant urban vegetation can be located over an entire property or be an individual tree or small group of trees.	

	Some trees within this protection category are specifically identified as significant landscape trees under the NALL and have different permit requirements	
Waterway and Wetland Vegetation (WWV)	Waterway and Wetland Vegetation within Brisbane do not always contain permanent water, they can be natural or man-made and may have environments that range from freshwater to salt water. They primarily act to store, capture and convey water throughout the city, and also provide important linkages between habitat areas for native wildlife, stabilize banks and minimize erosion and help maintain water quality.	

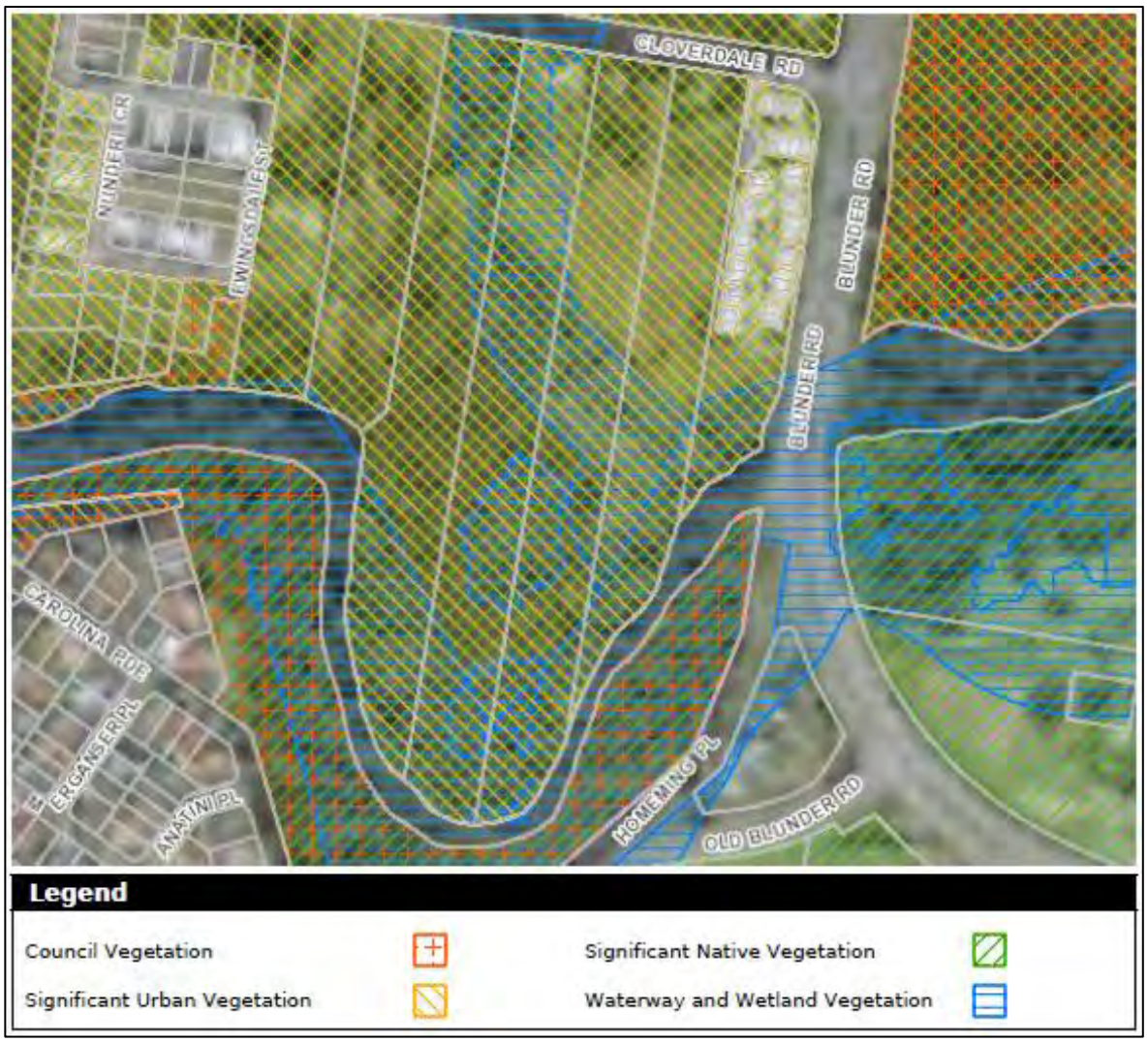

Figure 9 NALL Mapping

Source: Natural Assets Local Law (dated January 2022).

4.3 EPBC and NC Act Listed Species

Results from the PMST and Wildnet Online database searches are provided in Appendix A and summarised below.

4.3.1 Flora

The PMST returned 13 flora species protected under the EPBC Act with the potential to occur within the site, with six of those species and/or their habitat known or likely to occur within the area (see Figure 7). The Wildnet Online database search did not identify any NC Act listed flora species records within 1km of the site.

In addition, the site is not within a mapped High-Risk Area for protected plants listed under the NC Act. Therefore, a Protected Plants Flora Survey is not automatically required in accordance with the State's Flora Survey Guidelines prior to clearing works. If a listed flora species is identified during the clearing, work must cease until a Protected Plants clearing permit is obtained.

Table 7 Flora Species Likely to Occur as Identified in the PMST Database Search

Scientific Name	Common Name	EPBC Act Status	NC Act Status
Arthraxon hispidus	Hairy-joint Grass	V	V
Bosistoa transversa	Three-leaved bosistoa	V	-
Dichanthium setosum	Bluegrass	V	-
Macadamia integrifolia	Macadamia nut	V	V
Macadamia ternifolia	Small-fruited Queensland nut	V	V
Phaius australis	Lesser swamp-orchid	E	E

V = Vulnerable and E = Endangered

4.3.2 Fauna

The PMST identified 44 EPBC Act listed threatened fauna species and 12 EPBC Act listed migratory species as potentially occurring within the site, of which 26 are either known or likely to occur within the site. Within 1 km of the site since 1980, the Wildnet database search returned the following listed species records:

- Two mammal species (the koala and grey-headed flying fox)

Refer to Table 8 for results.

Table 8 Fauna Species Known and Likely to Occur as Identified in PMST and Wildnet Online Database Searches

Scientific Name	Common Name	EPBC Act Status	NC Act Status
BIRDS			
Anthochaera phrygia	Regent honeyeater	CE	CR
Erythrotriorchis radiatus	Red goshawk	V	E
Falco hypoleucos	Grey falcon	V	V
Hirundapus caudacutus	White-throated needletail	V, M, Ma	SL
Lathamus discolor	Swift parrot	CE, Ma	E
Rostratula australis	Australian painted snipe	E	E
Turnxi melanogaster	Black-breasted button-quail	V	V
MAMMALS			
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed quoll	E	-
Petauroides Volans	Greater glider	V	V
Phascolarctos cinereus (SEQ bioregion)	Koala	E	V
Pteropus poliocephalus	Grey-headed flying-fox	V	-
REPTILES			
Delma torquate	Adorned delma	V	V

NT = Near Threatened, V = Vulnerable, E = Endangered, CE/CR = Critically Endangered, M = Migratory, Ma = Marine, SL = Special Least Concern

4.4 Pest Species

Brisbane City Council have identified a number of flora and fauna species as pest species to be prioritised for management within the Brisbane LGA. These species have been evaluated and classified according to their social, economic or environmental impact to the Brisbane LGA, as well as the feasibility of their successful management. Six risk categories have been identified, see below.

Extreme	Extremely serious social, economic and ecological impacts. Requires significant investment to manage but the cost of not responding is likely to be catastrophic.
Significant	Serious social, economic and/or ecological impacts expected. Once established, these species are extremely difficult to eradicate. Early detection and eradication is a priority.
High	Likely to be well established in the Brisbane LGA. These species have significant impacts and are priorities for immediatemanagement.
Moderate	Where left unmanaged, these species can present significant impacts. May at times be a priority for management at a local or city wide level.
Low	Species that may be established, naturalised or that are not causing severe impacts across the Brisbane LGA. They include species that may be significant at local or property scales for management. Might be priorities for reduction where possible.
Very Low	Impacts are likely to be significant in some places but not equally across the Brisbane LGA. Where detected, these species are priorities for containment, surveillance and long-term management.

BCC Pest Species Risk Categories

Source: Brisbane City Council *Biosecurity Plan for the Brisbane Local Government Area*, 2018

4.4.1 Flora

Seven exotic flora species were identified by the Wildnet database search as being present within 1km of the site since 1980, refer to Appendix A. BCC identifies 57 weed species listed under the Biosecurity Act as known to the LGA and provides a risk classification (Table 9).

Table 9 Pest Flora Species Known in the BCC Area

BCC Risk Category	Common Name	Species Name
Significant	Alligator weed	*Altemanthera philoxeroides*
	Cabomba	Cabomba caroliniana
	Horsetails	*Equisetum spp.*
High	Broad-leaved pepper tree	*Schinus terebinthifolius*
	Cat's claw creeper	*Dolichandra unguis-cati*
	Hymenachne	*Hymenachne amplexicaulis*
	Kudzu	*Pueraria lobate*
	Parthenium	*Parthenium hysterophorus*
	Rat's tail grass/giant rat's tail grass	*Sporobulus pyramidalis and S.natalensis*
	Salvinia	*Salvinia molesta*
	Senegal tea	*Gymnocoronis spilanthoides*
	Water hyacinth	*Eichhornia crassipes*
	Water lettuce	*Pistia stratiotes*
	Water mimosa	*Neptunia oleracea (and N. plena)*
Moderate	Asparagus ferns	*Asparagus aethiopicus 'Sprengeri' A. africanus*
	Balloon vine	Cardiospermum grandiflorum
	Bridal creeper	*Asparagus asparagoides*
	Broadleaf privet	*Ligustrum lucidum*
	Giant Parramatta grass/rat's tail grasses/Parramatta grass	*Sporobolus fertilis, S. africanus, S. jacquemontii*

	Groundsel bush	*Baccharis halimifolia*
	Hygrophila/glush weed	*Hygrophila costata*
	Kahili ginger	*Hedychium gardnerianum*
	Madeira vine	*Anredera cordifolia*
	Willows	*Salix spp. other than S.babylonica, S. x calodendron, S. xreichardtii and S. chilensis; syn. S. humboldtiana*
Low	Annual ragweed	*Ambrosia artemisiifolia*
	Bitou bush	*Chrysanthemoides monilifera subsp. rotundata*
	Boneseed	*Chrysanthemoides monilifera ssp. monilifera*
	Camphor laurel	*Cinnamomum camphora*
	Chinese celtis	*Celtis sinensis*
	Dutchman's pipe	*Aristolochia elegans*
	Fireweed	*Senecio madagascariensis*
	Honey locust	*Gleditsia triacanthos including cultivars and varieties*
	Mexican feather grass	*Nassella tenuissima*
	Rubber vine	*Cryptostegia grandiflora*
	Tropical soda apple	*Solanum viarum*
	Yellow ginger	*Hedychium flavescens*
Very Low	African fountain grass	*Pennisetum setaceum (Cenchrus setaceus)*
	African tulip tree	*Spathodea campanulata*
	Athel pine	*Tamarix aphylla*
	Belly-ache bush/cotton leaf/physic nut	*Jatropha gossypiifolia*
	Bitterweed	*Helenium amarum*
	Blackberry	*Rubus anglocandicans, Rubus fruticosus agg*
	Chilean needle grass	*Nasella neesiana*
	Elephant ear vine	*Philodendron spp. Argyreia nervosa*
	Harrisia cactus	*Harrisia martinii*
	Lantana (all species)	*Lantana spp.*
	Mexican bean tree	*Cecropia. palmata* and *C. peltata*
	Miconia	*Miconia calvescens, M. racemosa and M. nervosa*
	Mother of millions hybrid	*Bryophyllum × houghtonii*
	Pond apple	*Annona glabra*
	Prickly pear/ tiger pear/ drooping tree pear/westwood pear/velvety tree pear	*Opuntia spp. (O. elata and O. microdasys – cat.2,3,4,5)*
	Sagittaria	*Sagittaria platyphylla*
	Singapore daisy	*Sphagneticola trilobata*

	Small-leaved privet/ Chinese privet	*Ligustrum sinense*
	Telegraph weed	*Heterotheca grandiflora*
	Yellow bells	*Tecoma stans*
	Yellow oleander/Captain Cook tree	*Cascabela thevetia syn. Thevetia peruviana*

4.4.2 Fauna

Ten exotic flora species were identified by the Wildnet database search as being present within 1km of the site since 1980, refer to Appendix A. Twelve pest animals classified as prohibited and restricted matters under the Biosecurity Act known in the Brisbane region are shown in Table 10, along with the relevant category under the Biosecurity Plan for the Brisbane LGA. In addition to this list, all matters managed by the Queensland Government (listed as Category 1 in the Act) pose extreme risks to the Brisbane LGA. This includes species such as the red imported fire ant (*Solenopsis invicta*) and the West Indian drywood termite (*Cryptotermes brevis*).

Table 10 Pest Animals Known to the BCC Area

BCC Risk Category	Common Name	Species Name
High	Dog – other than domestic	*Canis familiaris*, *Canus lupus*
	Fallow deer (feral)	Dama dama
	Cat – other than domestic	*Felis catus* and *Prionailurus bengalensis x Felis catus*
	European red fox	Vulpes vulpes
	Pig (feral)	*Sus scrofa*
	Red deer (feral)	*Cervus elaphus*
	Rusa deer (feral)	*Cervus timorensis*
Moderate	Red-eared slider turtle	*Trachemys scripta elegans*
	European rabbit (domestic and wild)	*Oryctolagus cuniculus*
Low	Goat (feral)	*Capra hircus*
	Sambar deer	*Rusa unicolor, syn. Cervus unicolor*
Very Low	Yellow crazy ant (tramp ant)	*Anoplolepis gracilipes*

Upon review of the fire ant biosecurity map, the locality of Doolandella is inside fire ant biosecurity zone 2 (refer to Appendix A). Therefore, there are restrictions to fire ant carrier movements (*National Red Imported Fire Ant Eradication Program 2016*) including the moving of soil, mulch, manure, baled hay, straw, potted plants, turf and compost. A Biosecurity Instrument Permit from the Department of Agriculture and Fisheries will be required if soil or other matter is moved outside of zone 2.

5.0 FIELD SURVEY RESULTS

5.1 Vegetation Communities

The field assessment identified five Vegetation Communities (VC) within the site; referred to as Vegetation Community 1 (VC1), Vegetation Community 2 (VC2), Vegetation Community 3 (VC3), Vegetation Community 4 (VC4) and Vegetation Community 5 (VC5) in this report.

Each vegetation community identified on site has been described in Table 11 below, with the extent of each of these VC's spatially represented in Figure 10 and representative photos shown in Plates 1 to 14.

Within the field survey three REs were verified as remnant vegetation, consistent with RE 12.5.3 (VC3), 12.3.7 (VC4) and 12.3.11 (VC5). No listed TEC's under the EPBC Act were identified.

Table 11 Vegetation Communities within the Site

VC	Description	TEC	RE
VC1	Highly disturbed area of vegetation primarily consisting of planted gardens, which were dominated by palms and fruit trees, with a mown grass understorey and infestations of weedy species. Landscape features, such as a pond surrounded by palms and thick understorey, were located within this VC between dwellings.	None	None
VC2	Highly disturbed area consisting of unkept paddocks which contained numerous weed species and was dominated by signal grass (*Urochloa decumbens*) and Guinea grass (*Megathyrsus maximus*).	None	None
VC3	Remnant vegetation was largely consistent with the mapped RE 12.5.3a 'Mixed woodland to open forest usually containing *Corymbia intermedia, Eucalyptus racemosa subsp. racemosa* and at least a presence of *Eucalyptus seeana.'* The community appeared to predominately contain scribbly gum (*Eucalyptus racemosa*), grey ironbark (*Eucalyptus siderophloia*), narrow-leaved red gum (*Eucalyptus seeana*) and pink bloodwood (*Corymbia intermedia*) in the canopy. Broad-leaved paperbark (*Melaleuca quinquenervia*) was prominent in the midstorey, whilst lantana (*Lantana camara*) sporadically dominated the shrub layer as well as soap box (*Alphitonia excelsa*). A creek passed through VC3, the bank of which was dominated by a weedy understorey of Singapore daisy (*Sphagneticola trilobata*), Brazilian nightshade (*Solanum seaforthianum*), climbing asparagus fern (*Asparagus africanus*) and basket plant (*Callisia fragrans*) amongst others. Within the eastern bounds of this community, many of the dominant canopy trees were dead. Early-stage rehabilitation efforts planted to	None	12.5.3

	reflect the regional ecosystem 12.5.3a were present through the northern extent of VC3.		
VC4	Remnant vegetation observed was largely consistent with the mapped RE 12.3.11 '*Eucalyptus tereticornis +/- Eucalyptus siderophloia, Corymbia intermedia* open forest on alluvial plains usually near coast.*'* The community was dominated by forest red gum (*Eucalyptus tereticornis*) and pink bloodwood in the canopy, with broad-leaved paperbark and black sheoak dominating the midstorey. As mentioned within VC3, several large canopy trees were dead and notable rehabilitation planting was evident on the eastern extent of VC4. The understorey appeared to have a lower weed presence then that of VC3 and was dominated by wiry panic (*Entolasia stricta)*, blady grass (*Imperata cylindrica)* and *Lomandra* spp.	None	12.3.11
VC5	Remnant vegetation observed was largely consistent with the mapped RE 12.3.7 '*Eucalyptus tereticornis, Casuarina cunninghamiana subsp. cunninghamiana +/- Melaleuca spp.* fringing woodland.' Within VC5 the canopy was made up of narrow-leaved red gum and forest red gum and grey ironbark. The midstorey was dominated by pink bloodwoods and casuarinas whilst the shrub layer was again dominated by lantana infestations which became increasingly dense moving towards Blunder Creek. Dead canopy trees and restoration efforts were present in the northern extent of VC5. The vegetation of this area was significantly more open than the remainder of VC3, 4 and 5 (refer to Plate 8 below). Mandated rehabilitation seeking to reflect RE 12.3.11 and 12.3.7 is located within the northern extent of VC5.	None	12.3.7

Figure 10 Vegetation Communities

Plate 1 Dwelling, mown understory, landscape trees and vegetation encroaching from the neighbouring property within the north-west corner of VC1.

Plate 2 Small artificial pond located between dwellings and surrounded by palms located between Lot 101 and 102.

Plate 3 Unkept paddocks within VC2 dominated by signal grass. A tree log is present in the foreground.

Plate 4 Invasive tall flat sedge species within VC2.

Plate 5 View of VC3 with heavy infestation of lantana.

Plate 6 Creek passing through VC3 with an understorey dominated by guinea grass, Singapore daisy and creeping inch plant (*Callisia repens)*.

Plate 7 View of VC4 dominated by broad-leaved paperbarks, pink bloodwood and sheoaks. A fallen tree within the foreground provides habitat features for local terrestrial fauna.

Plate 8 Restoration efforts within the eastern reaches of VC4, and the northern reaches of VC5 reflecting RE 12.3.11 and 12.3.7. Dead canopy trees are visible in the background.

Plate 9 View of scribbly gums and narrow-leaved ironbark in VC5, background, and lantana infestation, foreground.

Plate 10 An active Kookaburra hollow sighted within VC5.

Plate 11 Evidence of fauna scratches.

Plate 12 A stag tree with large hollows located in the northern reaches of VC5.

PIate 13 Diggings found within VC4.

PIate 14 View of a large forest red gum, located along the boundary of VC 4 and 5.

5.2 EPBC and NC Act Listed Species

5.2.1 Flora

No EPBC Act nor NC Act listed flora species were identified during the field survey.

A list of flora species identified during the field survey is provided in Appendix D.

5.2.2 Fauna

No EPBC Act nor NC Act listed fauna species were identified during the field survey.

A list of fauna species identified during the field survey is provided in Appendix E.

5.3 Pest Species

5.3.1 Flora

A total of 56 exotic plant species were recorded during the site inspection, of which 11 are recognised by the State as Category 3 restricted invasive plants under the Biosecurity Act and must not be sold, given away or released into the environment. A list of pest flora species identified during the field survey is provided in Appendix D.

5.3.2 Fauna

No prohibited or restricted fauna species or evidence of such fauna species were recorded on site during the field survey. One cane toad (*Rhinella marina*) was observed on site. The cane toad is not a prohibited or restricted invasive animal under the Biosecurity Act 2014, however everyone has a general biosecurity obligation (GBO) to take reasonable and practical steps to minimise the risks associated with invasive animals under their control.

5.4 Waterway

During the site inspection it was noted that the local waterway corridor did not reflect BCC mapping. The waterway flowed through the neighbouring property, parallel with the western boundary, before flowing south-east through the subject site in line with the northern edge of the bushland on site (northern boundary of VC3). BCC mapping indicates the waterway then flows south and connects to Blunder Creek, however the waterway appeared to dissipate and was no longer discernible south of proposed Lot 28.

The proposed development encroaches into the 30 metre buffer of the waterway west of the subject site, however this area predominately lacks trees or shrubs with the exception of few exotic tree species. The proposed development does not intrude into vegetated areas immediately surrounding the local waterway, refer to the vegetation retention plan (S521210_VRP_001(A), with the exception of a cadaghi, which is a BCC listed weed species.

6.0 ECOLOGICAL FUNCTION

Vegetation and ecological features within a site may offer local foraging resources to various fauna within the immediate vicinity of a site, whilst offering movement and regional foraging resources to more mobile and potentially migratory species. As such, when determining the ecological integrity and functionality of a site, it is prudent to analyse the site on a local, sub-regional and regional scale. The following sections discuss the site's role in the ecology of the broader landscape.

6.1 Biodiversity Corridors and Connectivity

Large patches of contiguous vegetation exist within the site, and to the east and west. Blunder Creek, a mapped citywide waterway corridor, runs through the south of the site which contains dense adjacent vegetation, providing connectivity for fauna movement between the east and west. Connectivity within the region between large pockets of vegetation is disrupted by linear infrastructure. Despite this, the area is well connected on a local level, allowing fauna to move quite freely through the landscape. Vegetation to the east of the site would likely encourage fauna into the locality. The site plays a major role in fauna movement through the broader landscape, however, it is not mapped within a Statewide Riparian or Terrestrial Biodiversity Corridor, or Regional Biodiversity Corridor (see Figure 11).

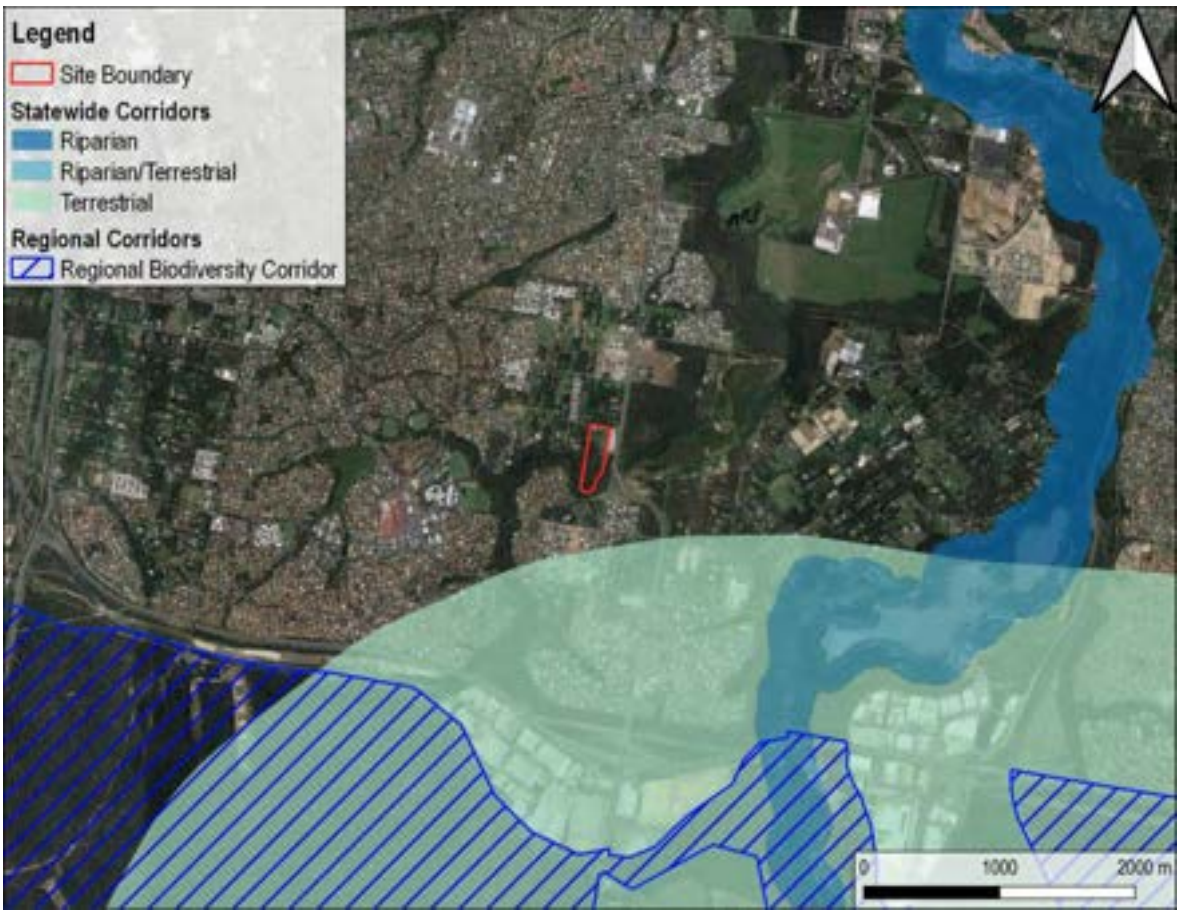

Figure 11 Regional Connectivity in relation to the Subject Site

Source: Statewide and Regional Biodiversity Corridors Mapping - Qld Spatial; Aerial Imagery - Queensland Globe (dated November 2021).

6.2 Summary of Local Site Habitat Values

In general, the subject site has a relatively moderate to high habitat value for native flora and fauna resulting from the presence of MSES remnant vegetation and creeks within the southern half of the site (VC3, VC4, and VC5). Within VC3, VC4 and VC5, arboreal habitat value is high due to the presence of hollow-bearing trees (Plate 12 and 14) whilst the widespread presence of ground layer strata provides exceptional habitat for terrestrial fauna (Plate 7). The remnant vegetation to the south of the site and much of the associated habitat values, are to be retained throughout development.

The proposed development encompasses the highly modified northern half of the site (VC1 and VC2). This consists of a combination of exotic landscape trees and a mown understorey surrounding the dwellings along the northern boundary of the site (VC1) and unmaintained paddocks which are dominated by exotic grasses (VC2). VC2 likely provides habitat to small mammals, reptiles and a range of common grassland bird species.

7.0 LIKELIHOOD OF OCCURENCE ASSESSMENT

The likelihood of EPBC Act and NC Act listed species within the site and in proximity to the site has been discussed below.

7.1 EPBC and NC Act Listed Species

7.1.1 Flora

Table 12 summarises listed flora species and their likely occurrence within the development area and in proximity to the development area, in the context of the site location and habitat available and ground-truthing. No listed flora species were identified as confirmed or considered likely to occur within the development area.

7.1.2 Fauna

Table 13 summarises listed fauna species and their likely occurrence on the site and in proximity to the site, in the context of the site location and habitat available and ground-truthing. One listed fauna species, the grey-headed flying fox, was considered likely to occur intermittently within the development area for foraging purposes.

Five listed fauna species is like considered likely to occur in proximity to the development area, including:

- Black-faced monarch;
- Koala;
- Rufous fantail;
- Spectacled monarch; and
- White-throated needletail.

All of these five fauna species had records within 1km of the site. While habitat within the development area was marginal, more suitable habitat exists in proximity. As such, their likelihood of occurrence in proximity to the development area is considered to be likely. All other fauna species identified in the desktop assessment were considered to be either unlikely or possibly occurring within the development area and in proximity to the development area.

Table 12 Likelihood of Occurrence for Listed Flora Species within the Site

Scientific Name	Common Name	EPBC Act Status	NC Act Status	Typical Habitat	Likelihood of Occurrence within Development Area	Likelihood of Occurrence in Proximity to Development Area
Anthraxon hispadus	Hairy-joint grass	V	V	Found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps.	Possible	Possible
Bosistoa transversa	Three-leaved bosistoa	V	-	Grows in wet sclerophyll forest, dry sclerophyll forest and rain forest up to 300m above sea level (BRI, n.d.; DoEE 2019).	Possible	Possible
Corchorus cunninghamii	Native jute	E	-	The Native Jute is found in a mosaic of wet sclerophyll and subtropical rainforest as well as grassy open forest. This species is generally located at low to mid elevations (110–430 m). In general, the soils are shallow, stony and well drained and common canopy species occurring alongside this species include Grey Gum (Eucalyptus propinqua), Brush Box (Lophostemon confertus) and Grey Ironbark (Eucalyptus siderophloia)	Possible	Possible
Cupaniopsis shirleyana	Wedge-leaf tuckeroo	V	-	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. (Thomas & McDonald 1989). Sites where the species has been found are mostly simple microphyll closed forests to tall, closed forest, often with Hoop Pine (Araucaria cunninghamii) emergents. There are a few sites which support a more moist rainforest ecosystem known as 'simple notophyll vineforest'.	Possible	Possible
Dichanthium setosum	Bluegrass	V	-	Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. Bluegrass occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland.	Possible	Possible
Fontainea venosa	Southern blushwood	V	V	Fontainea venosa 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.	Unlikely	Unlikely

Scientific Name	Common Name	EPBC Act Status	NC Act Status	Typical Habitat	Likelihood of Occurrence within Development Area	Likelihood of Occurrence in Proximity to Development Area
Macadamia integrifolia	Macadamia nut	V	V	Often grows in remnant rainforest, including complex mixed notophyll forest and extremely tall, closed forest, and prefers partially open areas such as rainforest edges (Barry & Thomas 1994; Ryan 2006; Gross 1995; Stanley & Ross 1986; DoEE 2019).	Unlikely	Unlikely
Macadamia tetraphylla	Rough-shelled bush nut	V	V	Rough-shelled Bush Nut is a rare species that generally occurs in subtropical rainforest and complex notophyll vine forest, at the margins of these forests and in mixed sclerophyll forest.	Unlikely	Unlikely
Phaius australis	Lesser swamp-orchid	E	E	The Lesser Swamp-orchid is associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest. Typically it is restricted to swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp Mahogany/Swamp Box (*Lophostemon suaveolens*)), swampy rainforest (often with sclerophyll emergents), or fringing open forest (Benwell 1994b; Bishop 1996; Harden 1993; DoEE 2019).	Possible	Possible
Rhodamnia rubescens	Scrub turpentine	CE	CR	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Possible	Possible
Rhodomyrtus psidiodes	Native guava	CE	E	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	Possible	Possible
Samadera bidwilli	Quassia	V	V	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.	Possible	Possible
Thesium australe	Austral toadflax	V	-	A widespread but rare herb that grows in shrubland, grassland or woodland, often on damp sites, in southern Qld and coastal NSW	Possible	Possible

NT = Near Threatened, V = Vulnerable, E = Endangered, CE/CR = Critically Endangered, SL = Special Least Concern

Table 13 Likelihood of Occurrence for Listed Fauna Species within the Site

Scientific Name	Common Name	EPBC Act Status	NC Act Status	Typical Habitat	Likelihood of Occurrence within Development Area	Likelihood of Occurrence in Proximity to Development Area
BIRDS						
Anthochaeara Phrygia	Regent honeyeater	CE	E	Mostly inhabits inland slopes of the Great Dividing Range. In QLD, breeding occurs regularly west of Warwick. Found in dry eucalypt woodland and open forest, rural and urban areas with mature eucalypts.	Possible	Possible
Botaurus poiciloptilus	Australasian bittern	E	E	The Australasian Bittern favours permanent or seasonal freshwater wetlands with tall, dense vegetation (Marchant and Higgins, 1990; DoEE 2019).	Unlikely	Possible
Calidris ferruginea	Curlew sandpiper	CE	CR	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 (Higgins & Davies, 1996; DoEE 2019)	Possible	Possible
Cyclopsitta diopthalma coxeni	Coxen's fig-parrot	E	E	Lowland subtropical rainforests.	Unlikely	Possible
Erythrotriorchis radiatus	Red goshawk	V	E	A rare bird of prey that prefers forest and woodlands with a mosaic of vegetation types, including, eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins, all within close proximity to permanent water (Aumann & Baker-Gabb 1991; Debus & Czechura 1988b; DoEE 2019).	Possible	Possible
Falco hypoleucos	Grey falcon	V	V	The grey falcon is 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. It has a sparse distribution and is absent from Cape York Peninsula, south of the Great Dividing Range in Queensland and New South Wales, south of the Great Dividing Range in Victoria, and south of 26oS in Western Australia (Barrett et al. 2003).	Possible	Possible

Scientific Name	Common Name	EPBC Act Status	NC Act Status	Typical Habitat	Likelihood of Occurrence within Development Area	Likelihood of Occurrence in Proximity to Development Area
Geophaps scripta scripta	Squatter pigeon	V	V	The squatter pigeon prefers open woodland dominated by Eucalyptus, Corymbia, Acacia or Callitris species within close proximity to water. It is typically found in the interior of eastern Australia west of the Divide from north-east New South Wales to Cape York.	Possible	Possible
Grantiella picta	Painted honeyeater	V	V	The painted honeyeater lives in dry, open forests and woodlands (box, ironbark, yellow gum, melaleuca, casuarina, callitris, acacia). The species usually occurs in areas with flowering and fruiting mistletoe and flowering eucalypts.	Possible	Possible
Hirundapus caudacutus	White-throated needletail	V, M ,Ma	SL	Almost exclusively aerial but known to roost among dense foliage of forest and woodland area. Common migrant Oct-Apr, mainly in eastern Australia and Tasmania.	Possible	Likely
Lathamus discolor	Swift parrot	CE, Ma	E	Breeding in Tasmania from Sep-Feb; winter nomadic visitor to sclerophyll forests and woodlands in south-east Queensland to South Australia.	Possible	Possible
Numenius madagascariensis	Eastern curlew	CE, M	E	The Eastern Curlew is the largest shorebird in Australia, it generally occupies sheltered coasts, in particular coastal lakes, inlets, bays and estuaries with large intertidal mudflats or sandflats where it feeds on crabs and molluscs (Marchant & Higgins, 1993; DoEE 2019).	Unlikely	Unlikely
Rostratula australis	Australian painted snipe	E	E	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains (Marchant & Higgins 1993; DoEE 2019).	Unlikely	Possible
Turnix melanogaster	Black-breasted button-quail	V	V	Restricted to rainforests and forests, mostly in areas with 770-1200 mm rainfall per annum. They prefer drier low closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, Araucarian microphyll vine forest and Araucarian notophyll vine forest. They may also be found in low, dense acacia thickets and, in littoral area, in vegetation behind sand dunes.	Possible	Possible
MAMMALS						

Scientific Name	Common Name	EPBC Act Status	NC Act Status	Typical Habitat	Likelihood of Occurrence within Development Area	Likelihood of Occurrence in Proximity to Development Area
Chalinolobus dwyeri	Large-eared pied bat	CE	-	The Large-eared Pied Bat commonly occupies sandstone cliffs and fertile woodland valley habitat areas that are in close proximity to each other. Rainforest and moist eucalypt forests at high elevation are also important habitat.	Unlikely	Unlikely
Dasyurus hallucatus	Northern quoll	E	-	The Northern Quoll occupies a diversity of habitats across its range which includes rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert. Habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal.	Possible	Possible
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed quoll	E	-	While the spotted-tail quoll is likely extinct around Brisbane, it can occupy a range of habitats, with preference for mature wet forest with minimal disturbance. eucalypt forest and rainforest. Probably extinct around Brisbane area (Belcher 2000b; Green & Scarborough 1990; Watt 1993; DoEE 2019).	Possible	Possible
Petauroides volans	Greater glider	V	V	Largely restricted to eucalypt forests and woodlands, with a preference for forests with a diversity of eucalypt species. This species shelters in large tree hollows during the day.	Possible	Possible
Phascolarctos cinereus (SE Mainland Population)	Koala	E	V	Eucalypt forests in eastern QLD, NSW and VIC.	Possible	Likely
Pteropus poliocephalus	Grey-headed flying-fox	V	-	Camps located near water around coastal eastern Australia.	Likely	Likely

Scientific Name	Common Name	EPBC Act Status	NC Act Status	Typical Habitat	Likelihood of Occurrence within Development Area	Likelihood of Occurrence in Proximity to Development Area
Potorous tridactylus tridactylus	Long-nosed potoroo	V	V	Scattered populations extend from south-east Queensland to northern New South Wales. Occurs in a range of vegetation types from subtropical and warm temperate rainforest through to tall open forest with dense understorey to dense coastal heaths. It requires thick groundcover for protection and nesting material along with an abundant supply of fungi for food.	Possible	Possible
INSECTS						
Argynnis hypebius inconstans	Australian fritillary	CE	E	Found in scattered locations across south-eastern Qld and north-eastern NSW and known from Gympie and Port Macquarie areas. Restricted to areas where its larval food plant, Viola betonicifolia occurs and usually occurs around river estuaries or open swampy coastal regions.	Possible	Possible
REPTILES						
Delma torquata	Adorned delma	V	-	Inhabits eucalypt dominated woodland and open forest where it is associated with suitable micro-habitats (exposed rocky outcrops and deep leaf litter). The presence of rocks, logs, bark and other coarse woody debris, and mats of leaf litter (typically 30–100 mm thick) appears to be an essential characteristic of the Collared Delma microhabitat and is always present where the species occurs (Brigalow Belt Reptiles Workshop 2010; Davidson 1993; DoEE 2019).	Possible	Possible
Furina Dunmalli	Dunmall's snake	V	-	Little is known about Dunmall's Snake's ecological requirements. It has been found sheltering under fallen timber and ground litter, and is thought to use cracks in alluvial clay soils. It has been found in forests and woodlands on alluvial clay dominated by brigalow, native Cypress, or Bull-oak (Allocasuarina leughmannii). It has also been found in Spotted Gum, Ironbark and White Cypress Pine open forest and woodland on sandstone derived soils.	Possible	Possible
MIGRATORY MARINE BRIDS						

Scientific Name	Common Name	EPBC Act Status	NC Act Status	Typical Habitat	Likelihood of Occurrence within Development Area	Likelihood of Occurrence in Proximity to Development Area
Apus pacificus	Fork-tailed swift	M, Ma	SL	Found commonly over inland plains but, as well as over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh.	Possible	Possible
MIGRATORY TERRESTRIAL SPECIES						
Cuculus optatus	Oriental cuckoo	M	SL	The oriental cuckoo usually follow the East coast and the Great Dividing Range as far southward as about the NSW/QLD border. Occasionally, they are found on a narrow coastal fringe in NSW, as far South as Sydney. In Australia Oriental Cuckoos are found mostly in forest and woodland, but they can also be present in parks.	Possible	Possible
Monarcha melanopsis	Black-faced monarch	M	SL	Rainforest, sclerophyll forest and woodland in dense gullies in eastern, coastal Australia.	Possible	Likely
Monarcha trivirgatus	Spectacled monarch	M	SL	Habitat preference for thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves.	Possible	Likely
Motacilla flava	Yellow wagtail	M	SL	The yellow wagtail favours wet meadows, marshland, grassy and muddy lakeshores. Occurs in fields and often near livestock during migration	Possible	Possible
Myiagra cyanoleuca	Satin flycatcher	M	SL	Uncommon migrant along eastern Australia. Found in thick gullies.	Unlikely	Possible
Rhipidura rufifrons	Rufous fantail	M	SL	Common migrant or resident in rainforest and forests along eastern portion of Australia.	Possible	Likely
MIGRATORY WETLANDS SPECIES						
Actitis hypoleucos	Common sandpiper	M	SL	The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The common sandpiper has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties.	Unlikely	Unlikely

Scientific Name	Common Name	EPBC Act Status	NC Act Status	Typical Habitat	Likelihood of Occurrence within Development Area	Likelihood of Occurrence in Proximity to Development Area
Calidris acuminata	Sharp-tailed sandpiper	M	SL	Muddy edges of fresh or saltwater wetlands throughout Australia.	Unlikely	Unlikely
Calidris melanotos	Pectoral sandpiper	M	SL	In Australasia, 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. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The species has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands	Unlikely	Unlikely
Gallinago hardwickii	Latham's snipe	M	SL	Common migrant from Japan and Kuril to eastern and Tasmanian swamps and wet grasslands.	Possible	Possible
Pandion haliaetus	Osprey	M	SL	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, particularly in northern Australia.	Unlikely	Unlikely
Tringa nebularia	Common greenshank	M	SL	The Common Greenshank does not breed in Australia, however, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia.	Unlikely	Unlikely

NT = Near Threatened, V = Vulnerable, E = Endangered, CE/CR = Critically Endangered, M = Migratory, Ma = Marine, SL = Special Least Concern.

8.0 POTENTIAL IMPACTS, RECOMMENDATIONS AND MITIGATION MEASURES

8.1 Impacts and Mitigation Measures for EPBC and NC Act Species

Direct potential impacts are not considered likely for the black-faced monarch, rufous fantail and spectacled monarch, as they commonly inhabit rainforest gullies and woodland areas. Within the subject site, vegetation which matches this description is located outside the proposed development area. Similarly, for the koala and the grey-headed flying fox, the habitat appropriate for these species is largely located outside the site's development area, thus limiting the potential impacts developing the site will have on these species (see Table 14). It is noted that the grey-headed flying-fox

Table 14 Potential Impacts to EPBC and NC Act Listed Species

POTENTIAL IMPACTS	RECOMMENDATIONS AND MITIGATION MEASURES
KOALA	
The proposed development largely avoids removing koala habitat trees within the site. Koala movement through the site is considered likely to occur, especially east-to-west through the southern extent and outside the development area. Construction noise and post-development urban noise levels may disturb the species. Individuals found in urban environments are twice as likely to respond to human disturbance, making them hypersensitive, and desire to avoid human disturbances can lead to the animal expending unnecessary energy (Kinsella et al, 2015).	It is recommended that the proposed development strengthens the resilience and sound buffering of the EPZ area. It is noted that council enforced planting is currently being undertaken south of the waterway which should improve sound buffering. It is recommended additional planting be undertaken where possible south of the proposed stormwater channel, refer to Figure 12. It is additionally recommended that sound barrier fencing is temporarily implemented as part of operational works. Tree Protection Fencing erected as temporary panels can have "acoustic curtains" added to act as a noise barrier on construction sites. A Concept Rehabilitation Plan should be compiled to outline restoration efforts.
RUFOUS FANTIAL, BLACK-FACED MONARCH, SPECTACLED MONRACH	

POTENTIAL IMPACTS	RECOMMENDATIONS AND MITIGATION MEASURES
The proposed development largely retains the vegetation throughout the southern extent of the site, outside the development area, which may be inhabited by rufous fantail, black-faced monarch and spectacled monarch. Construction noise (as vibration and sound) may have the potential to impact feeding or breeding behaviour. The breeding period for the rufous fantail is between September to February, with 81% of eggs laid in November to December (DoE, 2021). The breeding period for the black-faced monarch is between October to March, with the egg laying period mostly from November to mid-January (DoE, 2021). The breeding period for the spectacled monarch is between September and February (Birdlife, 2020)	A licenced Fauna Spotter Catcher to undertake a pre-clearance survey at least 48 hours prior to the commencement of clearing works and to be present at all times during clearing works. Noise levels should be limited to acceptable levels during construction, especially during the height of the breeding period November to January.
GREY-HEADED FLYING-FOX	
The nearest known flying fox roost, counted in 2018, is located approximately 4.3km west of the site along Bullock Head Creek (DAWE, 2022), which means the development will not cause disturbances to any known flying fox camp. However, the proposed development involves the removal of potential foraging habitat (located in VC1) for individuals that seasonally forage the area.	It is recommended as part of this report that the proposed development rehabilitates the eastern most extent of the stormwater drain and undertakes weeding through a designated area within the southern extent of the site. These works will mitigate any potential loss of foraging resources.
WHITE-THROATED NEEDLETAIL	

POTENTIAL IMPACTS	RECOMMENDATIONS AND MITIGATION MEASURES
The proposed development will remove grassland (open paddock) that may be utilised by white-throated needletail for aerial feeding opportunities, however it is S5 Environmental's understating that in accordance with the EPBC significant impact guidelines, removal of this disturbed grassland is unlikely to have a significant impact on the species.	A licenced Fauna Spotter Catcher to undertake a pre-clearance survey at least 48 hours prior to the commencement of clearing works and to be present at all times during clearing works.

8.2 Impacts and Mitigation Measures for Other Ecological Values

Table 15 below outlines potential impacts, recommendations, and mitigation measures for ecological values within the site.

Table 15 Potential Impacts, Recommendations and Mitigation Measures

POTENTIAL IMPACTS	RECOMMENDATIONS AND MITIGATION MEASURES
FLORA, FAUNA, HABITAT VALUE AND FUNCTIONALITY	
• The removal of approx. 2.5 ha of predominately disturbed paddock grassland and garden shrubs/trees within the site will reduce foraging and habitat resources to fauna species.	• Loss of habitat mitigated by rehabilitation of approx. 1.5 ha of the site including: - Placement of woody debris from felled timber into rehabilitation areas to increase habitat for terrestrial fauna; and - Weed management; (see Figure 12) • Vehicle movements are managed through traffic calming devices like speed bumps to control vehicle speed within and approaching (driveway) the site to reduce potential for fauna vehicle strike; and • Outdoor and security lighting should be wildlife friendly e.g. - directional lighting focused toward the centre of the development; the use of shields or fittings can minimise light spill into adjacent vegetation and direct light to where it is needed; Lighting could be placed lower, to minimise ecological impacts.

POTENTIAL IMPACTS	RECOMMENDATIONS AND MITIGATION MEASURES
• Fauna injuries and fatalities have the potential to occur during vegetation clearing works on the site.	• Vegetation will require removal as part of the development. For the removal of vegetation within the Development Footprint, the following fauna management measures will be undertaken: - A Queensland Government qualified Fauna Spotter/Catcher must be commissioned to undertake fauna spotter/catching works during any clearing works; - Any recovered fauna may be re-located into the vegetation associated with surrounding bushland areas; - The Fauna Spotter/Catcher must direct clearing works at all times and works cease/pause at the fauna spotter's request; and - Any injured fauna resulting from clearing works are to be handled only by the qualified Fauna Spotter/Catcher and taken to a veterinary clinic or registered wildlife carer.
• Increased risk of fauna injury and fatalities associated with domestic animals.	• Domestic animals should be excluded from site at all times during construction and ongoing operation of the facility. • It is recommended that pet exclusion fencing is installed along the southern edge of the proposed stormwater channel. Pet exclusion fence should utilise chainwire to avoid impacting the hydrology, and potential overflow, of the stormwater channel. • It is recommended that koala exclusion panels are implemented on the outer side of the pet exclusion fencing to prevent fauna from entering urban areas.
INVASIVE AND EXOTIC FLORA	

POTENTIAL IMPACTS	RECOMMENDATIONS AND MITIGATION MEASURES
• Disturbance associated with earthworks may act as a dispersal mechanism to encourage weed dispersal to adjacent sites which may further encourage existing exotic species to proliferate.	• The remnant vegetation on site is already suffering weed invasion, including the waterway. It is recommended that the waterway, and a dense area of lantana infestation is treated as part of the development, and appropriate weed control measures undertaken during construction to avoid further spread of invasive plants.
STORMWATER, POLLUTANTS AND EROSION	
• Unmanaged site stormwater runoff during construction may carry sediment and pollutants into the local stormwater networks, which may bring about deterioration in water quality. This may, in turn, adversely affect the health of flora and habitat value to local fauna.	• It is recommended that appropriate sediment and erosion controls are in place prior to and during construction works; • Runoff from the site during the construction phase of the development should be managed. During the construction phase, this will entail the development of and adherence to erosion control procedures which will locate and describe measures to ensure that sediments do not leave the site and degrade the receiving environment; • Any fill introduced to the site should be certified as clean and free from contaminants; • It is recommended that the stormwater drain is densely planted with appropriate native groundcover species tolerant of inundation, to reduce the likelihood of erosion occurring. Canopy trees are to be planted along the stormwater batters wherever possible given potential bushfire concerns. Furthermore, the implementation of a combination of large logs, scattered rock and planting is recommended along the eastern most extent of the stormwater channel to limit erosion.

Figure 12 Proposed Rehabilitation

9.0 CONCLUSIONS

This Ecological Assessment determined areas of the subject site to be of moderate ecological value. The site is likely to provide habitat for six EPBC Act and/or NC Act listed species, however the habitat for these species will be largely unaffected due to being located outside the development area. Only one species, the grey-headed flying-fox, has been identified as likely to occur within the development area. With the implementation of recommendations and mitigation measures outlined in Section 8.0, the proposed development is unlikely to have a significant impact on the above-mentioned listed species.

Rehabilitation with native groundcover is recommended throughout the proposed stormwater channel, as well as planting of native canopy along the stormwater batter where complying with bushfire concerns. It is additionally recommended that a dense native mix of groundcovers, canopy and scattered rock are utilised in the eastern most extent of the stormwater channel to reduce potential for erosion (see Figure 12).

A Vegetation Retention Plan is to be developed to verify that the removal of state mapped Koala habitat (along the stormwater channel) does not exceed 500m^2, and an arborist will be required to verify whether vegetation present along the eastern extent of the stormwater drain can be retained, pending earthwork plans.

Refer to Table 16 for a summary of legislative requirements relating to ecology for the proposed development.

Table 16 Legislative Requirements for the Proposed Development

Legislation / Policy	Matter	Comments	Requirements
EPBC Act	Matters of National Environmental Significance (MNES)	The proposed development is unlikely to have a significant impact to any MNES.	Referral unlikely to be required
Planning Regulation	Koala habitat	The proposed development is largely outside the mapped koala habitat and is likely to remove less than 500m^2 of mapped Koala Habitat. Clearing of up to 500m^2 of Koala Habitat is considered exempted development under Schedule 24 (k) of the state Planning Regulation 2017.	An arborist is to be engaged to verify that vegetation surrounding the stormwater channel, specifically Trees 21 and 104, can be retained (refer to the Vegetation Retention Plan *S521210_VRP_001A*).
NC Act	Breeding Places	No active breeding places were observed within the proposed works during the field survey. However, a termitaria with a hollow was observed in Tree 18 (refer to	A fauna spotter to inspect site prior to clearing. If breeding places are detected at any time during site works, works must cease and an SMP

Legislation / Policy	Matter	Comments	Requirements
		the Vegetation Retention Plan S521210_VRP_001A).	prepared and submitted to the State.
	Protected Animals	No protected animals identified during the field survey however several species are considered to be likely to occur within the site.	Fauna spotter catcher to be present during all clearing works and management measures in Section 8.0 implemented.
	Protected Plants	No protected plants detected during the field survey. Not a high risk mapped area.	None prior to works commencing. However, if protected plants are identified during clearing works, works must cease and advice sought regarding obtaining a protected plant clearing permit immediately.
Biosecurity Act	Prohibited and Restricted Matters	Restricted matter identified during the field survey.	Ensure works do not spread a pest, disease or contaminant issue in accordance with GBO. For State Category 3 listed plants, a person must not release these invasive plants into the environment, give away or sell as a plant or something infested with its seeds.
BCC *City Plan 2014*	Biodiversity Areas	Nil to very few HES and HESS trees are to be impacted by the proposed development (pending arborist inspection). Some koala habitat trees are to be removed from BCC Koala Habitat Area.	The proposed rehabilitation, will encourage potential koala movement through the southern portion of the site. With the recommended rehabilitation, the proposed development is considered to comply with the Biodiversity areas overlay code and no significant residual impact will result.
	Waterway Corridors	Some vegetation will require removal from the local waterway corridor (namely exotic weed species) and	It is recommended that an appropriate selection of native groundcover species is planted throughout the stormwater channel and

Legislation / Policy	Matter	Comments	Requirements
		earthworks are proposed within the waterway corridor. Engineering works within the waterway corridor should be minimsed to the greatest extent as possible to ensure that impacts to the waterway corridor are minimsed to address the waterway corridor code.	that canopy trees are plant along the batters of the stormwater channel, spaced appropriately to comply with bushfire restrictions. Further, it is recommended that the local waterway directly south of the development footprint is rehabilitated with weeding and planting of groundcover species in order to improve the overall condition of the waterway.
NALL	SUV, SNV, WWV	Proposed development interferes with each type of protected vegetation.	NALL Permit prior to commencement of clearing works

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