PREPARED FOR:

PGS INVEST PTY LTD

10 DECEMBER 2024

ECOLOGY ASSESSMENT REPORT: REVIEW OF MNES

DEVELOPMENT OF AGED CARE AND RETIREMENT ACCOMMODATION FACILITY LOT 372 SP104177

NEWGROUND

NEW GROUND | Gold Coast 6A & 6B 2563 Gold Coast Highway, Mermaid Beach | Brisbane 84a Brunswick Street, Fortitude Valley | Mail PO Box 713, Mermaid Beach QLD 4218

TELEPHONE 07 5530 7283 **ABN** 31 146 671 481 NEWGROUND.COM.AU

REPORT TITLE	ECOLOGY ASSESSMENT REPORT – REVIEW OF MNES
PROJECT	PROPOSED DEVELOPMENT OF LOT 372 SP104177
CLIENT	PGS INVEST PTY LTD.

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The preparation of this report has been in accordance with the project brief provided by the client and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

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APPROVED BY	NELSON WILLS	PREPARED BY	BRETT CAMPBELL
POSITION	DIRECTOR	POSITION	PRINCIPAL ENVIRONMENTAL SCIENTIST
SIGNED		SIGNED	
DATE	10/12/2024	DATE	10/12/2024

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Abbreviations

AHD	Australian height datum
API	Aerial photography interpretation
BoM	Bureau of Meteorology
CEEVNT	Endangered, Vulnerable, Near Threatened as listed under the NC Reg
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DESI	Department of Environment, Science and Innovation (Qld)
e.g.	For example
EH	Essential Habitat as defined by the VM Act
EP Act	Environmental Protection Act 1994 (Qld)
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)
etc.	etcetera
ha	Hectares
i.e.	That is
KHA	Koala Habitat Area as defined by Nature Conservation (Koala) Conservation Plan 2017
m	Metres
MLES	Matters of Local Environmental Significance
mm	Millimetres
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NC Act	Nature Conservation Act 1992 (Qld)
NC Reg (Animals)	Nature Conservation (Animals) Regulation 2020 (Qld)
NC Reg (Plants)	Nature Conservation (Plants) Regulation 2020 (Qld)
Planning Act	Planning Act 2016 (Qld)
Planning Reg	Planning Regulation 2017 (Qld)
Planning Scheme	Ipswich Planning Scheme 2006
PMST	Protected Matters Search Tool
RE	Regional Ecosystem
TEC	Threatened Ecological Community as listed under the EPBC Act
VM Act	Vegetation Management Act 1999 (Qld)
WoNS	Weed of National Significance

Chapter 1: Introduction

1.1 Background

New Ground Environmental Pty Ltd ('New Ground') was engaged by PGS Invest Pty Ltd ('the client') to undertake an ecological site assessment and targeted ecological surveys in relation to the proposed development of Lot 372 SP104177 ('the site'). The site is located at 107 Bertha Street, Goodna in the Ipswich City Local Government area (**APPENDIX A**). The site is 11.43 ha in area.

The proposed Abadi Gaia Adult Residential Village development is a Multiple residential retirement community/disability accommodation and aged care facility consisting of 204 dwelling units and 81 bed high care facility. The proposed development has been designed to minimize the impact of the development on the ecological attributes of the site and will retain 6.02 ha of the site as a conservation area.

The Abadi Gaia Adult Residential Village has been approved by the Queensland State Assessment and Referral Agency (SARA) and Ipswich City Council. SARA's approval related to matters of State Environmental Significance (MSES); namely approval against the assessment benchmarks of the Development in South East Queensland Koala Habitat Area, State Development Assessment Provisions (State Code 25). Ipswich City Council subsequently approved the Material Change of Use (MCU) for the proposed development.

The approvals include a number of conditions including requirements that the development must be constructed and operated in accordance with a number of Environmental Management plans including;

- Construction environmental management plan,
- Operational environmental management plan,
- Vegetation Management Plan
- Koala Management Plan, and
- Rehabilitation management plan.

The approved development (State and ICC) considered by this report is presented in **APPENDIX B**.

At the time of lodgement of the Development Application, the *Koala (Phascolarctos cinereus) and its combined populations in Queensland, New South Wales (NSW) and the Australian Capital Territory (ACT*), hereafter referred to as the "the Koala" was listed as Vulnerable pursuant to the Federal *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). A review of project impacts was assessed against the Referral Guideline for the Vulnerable (2012), and the proposed development (given its scale) was not deemed to offer an adverse effect on habitat critical to the survival of the koala and as such, did not trigger a referral to the Federal Department of Agriculture, Water and the Environment (DAWE).

Following the uplisting in status of the Koala pursuant to the EPBC Act from Vulnerable to Endangered on 12th February 2022, the potential for significant impact was reassessed in accordance with Matters of National Environmental Significance -Significant Impact Guidelines 1.1, and in consultation with the Department of Climate Change, Energy, the Environment and Water (DCCEEW) the proposed activity was determined as having the potential to result an adverse effect on habitat critical to the survival of the Endangered koala and as such, referral to the DCCEEW was recommended.

This report details numerous flora and fauna studies and assessments undertaken across the site conducted between October 2020 and September 2021 including targeted surveys for Threatened Flora and Fauna species for the development application to State Government Agencies and Ipswich City Council and subsequent surveys and assessments undertaken during September and October 2024 relating to recently listed species under the EPBC Act.

This version of the EAR has been prepared to accompany a referral pursuant to the EPBC act and as such some assessments pursuant to the local and State planning mechanisms that are not relevant to the referral process have been removed.

1.2 Objectives of the Study

The objectives of this report are to:

- Present the findings from a desktop and literature review of the ecological values of the site;

- Assess and ground-truth the ecological values pertinent to the site; in particular, the flora, fauna and vegetation communities found within the site, with particular emphasis on prescribed matters that are of local, state or national environmental significance;
- Detail the targeted ecological surveys and surveys, including habitat quality assessments undertaken within the Study area;
- Discuss the presence or expected presence of native flora and fauna species that are regulated under local, state and Commonwealth legislation;
- Describe and map vegetation communities and ecological features within the site that are regulated under relevant local, state and Commonwealth legislation; and
- Provide considerations with respect to ecological values within the site to inform detailed project design works.

1.3 Outline of the Report

This report has been prepared with consideration to the relevant provisions of the Ipswich Planning Scheme 2006 (Planning Scheme), *Vegetation Management Act 1999* (VMA), *Nature Conservation Act 1992* (NC Act), *Planning Act 2016* (Planning Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report is structured as follows:

- **Chapter 1:** Introduces the project, the subject study and the report;
- **Chapter 2:** Discusses the site locality, climate, bioregion, geology and topography of the site;
- **Chapter 3:** Outlines the methodology used for the desktop review and field study and discusses the limitations associated with this study;
- **Chapter 4:** Presents and discusses the results of the desktop review and the field survey;
- **Chapter 5:** Provides summary of project impacts in relation to MLES and MSES; and
- **Chapter 6:** Provides a review of project impacts on MNES
- **Chapter 7:** Provides a summary conclusion in light of the findings of the subject study.

Chapter 2: Site Context

TABLE 2.1 below provides broad context around the site.

TABLE 2.1: SITE CONTEXT

CONTEXT	DESCRIPTION
Bioregion	The site is located within the South- East Queensland bioregion (IBRA) which covers an area of 62,484.2 km² and covers the coastal area from Gladstone to the Queensland-New South Wales border and out west to the Great Dividing Range (DoE, 2016a). The southeast Queensland bioregion is dominated by open sclerophyll forests, predominantly eucalypt communities containing both grassy and shrubby understoreys (Tran and Wild, 2000). The South-East Queensland bioregion has been further divided into 14 sub-bioregions (IBRA) and the site is located within the Moreton Basin sub-region (DNRM, 2010; Queensland Globe, 2020).
Pre-development land use	The site is set within a rural residential to urban land use context. The site is fringed by Church Street to the west, Bertha Street to the east. Conservation areas occur beyond both of these roads (Church Street Reserve to the west and a Conservation-zoned parcel to the east). Rural residential settlement occurs to the site's north, while the site's southern boundary is fringed by a high voltage electricity easement (~80 m wide). Rural residential and urban settlement occurs south of the electricity easement. Except for a shed at the northwest corner, the subject site was undeveloped at the time of New Ground survey works.
Soils and geology	The topography of the site is undulating and at a range of elevation of between ~20 – 60 m AHD (Queensland Globe, 2020). The site is generally of a north-westerly aspect, with the south-eastern corner at ~60m AHD and the north-western corner at about 20 m AHD. Site topography is punctuated by two (2) drainage gullies that both traverse the site in a general south-east to north-west direction, According to the Surface geology (1:100,000) data layer of Queensland Globe (2020), the geology of the site is described as being part of the Raceview Formation, which is a stratified unit of volcanic and metamorphic rocks consisting of sublabel to quartzose sandstone, shale, mudstone, thin coal seams and siltstone. Based on the 'Pre-clear regional ecosystems' data layer of Queensland Globe (Queensland Government, 2020), the site is within Land zone 9-10. Land zone 9-10 is described as Cainozoic/Proterozoic consolidated sediments (Qld Government, 2020).
Climate	The climate of the site and broader locality is characteristic of sub-tropical Queensland. Climate data from Brisbane weather station (Bureau of Meteorology (BoM) site No: 040211) presents mean annual maximum and minimum temperatures of 26.3° C and 14.4° C respectively, and a mean annual rainfall of 1052.9 mm (BoM, 2020). On average, the warmest month is January, and the coldest month is July. January has a mean annual maximum temperature of 30.5° C, and July has a mean annual minimum temperature of 7.7° C (BoM, 2020). Rainfall is generally typical of the sub-tropical climate, with a large proportion of annual rainfall occurring during the summer months of December, January and February. On average, the wettest month is February (mean rainfall of 152.8 mm) and the driest month is September (mean rainfall of 34.6 mm) (BoM, 2020).

Chapter 3: Methodology

3.1 Desktop and Literature Review

TABLE 3.1 below presents the sources that were utilized during the environmental planning desktop and literature review. Data searches were conducted using a 5 km radial buffer around the central coordinates of Latitude: -27.6221; Longitude: 152.8970.

TABLE 3.1: DESKTOP AND LITERATURE REVIEW SOURCES

DATABASE/POLICY/LEGISLATION/GUIDELINE
LOCAL GOVERNMENT (Ipswich Planning Scheme 2006)
Zoning map
Difficult Topography overlay map
Urban Catchment Flow Paths overlay map
High Voltage Electricity Transmission map
Significant landscape tree overlay map
STATE GOVERNMENT
SPP Interactive Mapping System (DA)
Department of Science, Information Technology and Innovation (DSITI) Nature Conservation Act 1992 (NC Act) Protected Species Lists Wildlife Online Database (DSITI, 2024)
Department of Natural Resources and Mines (DNRM) Vegetation management regional ecosystem and remnant map (DNRM, 2024)
Koala Plan (Koala Habitat Area and Priority Koala Area) Mapping (DESI, 2024)
Protected plants flora survey trigger map (DESI, 2024b)
Queensland Waterways for Waterway Barrier Works (DAF, 2016)
FEDERAL GOVERNMENT
EPBC Act Protected Matters Search Tool (DCCEEW, 2024)

3.2 Field Surveys and Assessment

Field investigations were undertaken by senior ecologists over a number of periods between October 2020 and September 2021, with subsequent surveys conducted during September and October 2024 using the methodology detailed in the following sections.

The field surveys were designed to identify the Vegetation communities within the study area, undertake habitat assessments for Threatened species and to target Threatened and Significant Flora and Fauna species. The September/October 2024 surveys were designed specifically to target species listed pursuant to the EPBC Act after 2021 (such as flora and bird species) and, to determine any changes in the vegetation, habitats or, Koala utilisation of the site.

The location of formal survey points undertaken during the field surveys are demonstrated in **APPENDIX A**. Formal surveys were supplemented with opportunistic observations and random meanders. A summary of New Ground field survey events undertaken over the site are presented in **TABLE 3.2** below.

TABLE 3.2: FIELD SURVEYS UNDERTAKEN AT SUBJECT SITE

TYPE OF SURVEY	DATE
RE Validation and preliminary Ecological investigations	9th October 2020
KSAT Surveys, Habitat features Assessment, Vegetation Surveys	19th November 2020
Spotlight surveys, Frog call playback surveys and Herpetofauna Searches	11th and 14th December 2020
Koala Habitat Values Plot surveys (additional Koala scats surveys and tree counts/habitat value plots)	30th August 2021
Call Playbacks- Owls and additional Spotlighting	1st and 2nd September 2021
Targeted Threatened Flora searches (EPBC) / Protected Plants (NC Act)	29th September 2021
Additional KSAT Surveys, Targeted Threatened Flora searches (EPBC) / Protected Plants (NC Act) and bird surveys	11th and 12th, 18th and 19th September 2024
Additional Targeted Threatened Flora searches (EPBC) (Leafless Tongue Orchid) and Threatened bird surveys	3rd October 2024

3.2.1 Vegetation Community Surveys

The vegetation community survey was conducted in accordance with industry best practice standards and employed a methodology generally consistent with the established format detailed within Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland, Version 7 (Neldner et al., 2023). Site selection was determined in the field based on perceived aerial photography patterns in vegetation composition and in response to variation in vegetation communities encountered during site traverses. The survey design emphasised the collection of vegetation community data using tertiary/quaternary sites, with quaternary sites used to provide additional survey resolution and refinements in vegetation community delineation.

Vegetation community data was collected from ten (10) modified quaternary survey sites during the survey. At each survey site, data was collected from a 25-50 m radial plot (**APPENDIX A**). In general accordance with Neldner et al, (2019), at a minimum the following data was collected from each survey site:

- Date and time;
- Location;
- In-field determination of the remnant status of the vegetation;
- Structural formation class using the modified Specht (1970) classification system (Neldner et al., 2023); and
- Floristic composition and relative abundance for the predominant species in the canopy, shrub and ground layers.

3.2.2 Fauna Habitat Assessment

Fauna habitat assessments were undertaken in conjunction with vegetation survey sites, using the plot that was sampled for the vegetation community survey. These formal assessments were undertaken when a new or different type of vegetation or habitat was intersected, as it is anticipated that similar vegetation types would host similar habitat features. A total of seven (7) formal habitat assessments were undertaken within the site (**APPENDIX A**). At a minimum, the following data was collected from each fauna habitat assessment site:

- Bare ground (estimated % cover);
- Boulders (estimated % cover);
- Fallen bark (estimated % cover);
- Groundcover (estimated % cover);
- Leaf litter (estimated % cover);
- Embedded rocks (estimated % cover);
- Loose rocks (estimated % cover);
- Shrub layer (estimated % cover);
- Crevices and ledges (abundance);
- Overhangs and caves (abundance);
- Nests (abundance);
- Small logs (abundance);

- Large logs (abundance);
- Logs with hollows (presence & size);
- Termite mounds (abundance);
- Mistletoe (abundance);
- Soil cracks (presence);
- Water features (type & presence); and
- Other (stags, senescing trees, tree hollows, soil features, etc.) (type & number).

3.2.3 Ecological Feature Surveys

Ecological features were recorded where encountered during the survey. We refer to habitat associations in this report as potential fauna habitat or breeding places, as well as signs of fauna presence (tracks, scats and scratches). When habitat associations were encountered, a GPS point was taken to record the location and a description of the habitat was recorded. Fauna habitat types and signs that were recorded included:

- Scratch marks;
- Scats;
- Tracks;
- Orts;
- Nests;
- Aquatic features;
- Hollow logs and size of hollows (small: < 35mm diameter; medium: 35-100 mm diameter; large: >100 mm diameter);
- Log piles; and
- Hollow-bearing trees/stags and size of hollows (small: < 35 mm diameter; medium: 35-100 mm diameter; large: >100 mm diameter).

3.2.4 Targeted Flora and Fauna Surveys

Targeted flora and fauna surveys were undertaken for Threatened and Locally Significant species identified through the desktop review process. Searches were undertaken within areas considered to contain likely habitat for the target species. Survey effort was apportioned between the following survey techniques at the discretion of the ecologist:

- Diurnal active search, comprising investigation of potential habitat features (e.g. leaf litter, logs, rocks, peeling bark) and scanning vegetation canopies for fauna and inferential evidence of fauna presence (e.g. scratches, scats, tracks, diggings, shed skins, orts, nests, stick or mud nests and dreys);
- Diurnal bird survey, with species being identified through either visual observation and/or call recognition;
- Diurnal Herpetofauna active search targeting threatened amphibians and reptiles;
- Spotlighting targeting nocturnal arboreal mammal, megachiropteran bats and ground mammals and threatened and Passive Nocturnal Searches targeting threatened amphibians and reptiles;
- Call Playbacks for the Tusked Frog (*Adelotus brevis*);
- Call playbacks for the Powerful Owl (*Ninox strenua*); and
- Threatened and locally significant targeted Flora surveys

These surveys were undertaken in accordance with the requirements of *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland*, June 2022 (v 4.0) for each survey type and generally exceeded the minimum survey efforts specified.

Targeted Flora surveys

Targeted Threatened Flora surveys were undertaken over a period of approximately four (4) hours on the 29th of September 2021 by a senior ecologist and approximately four (4) hours between the 11th September and 3rd October 2024. The species targeted were identified from the EPBC Act Protected Matters Search Tool and Wildlife online database searches for the local area as shown in **TABLE 3.3** below.

TABLE 3.3: TARGET THREATENED FLORA SPECIES (EPBC ACT / NC ACT SPECIES)

COMMON NAME	SPECIES	NC ACT	EPBC
Hairy-joint Grass	*Arthraxon hispidus*	-	Vulnerable
Three-leaved Bosistoa, Yellow Satinheart	*Bosistoa transversa*	-	Vulnerable
Bailey's cypress	*Callitris baileyi*	Near Threatened	-
-	*Calyptochloa gracillima subsp. ipsviciensis*	Critically Endangered	-
-	*Coleus habrophyllus*	Endangered	Endangered
	Coleus omissus (listed as Plectranthus omissus)	-	*Endangered*
Native Jute	*Corchorus cunninghamii*	-	Endangered
Leafless Tongue-orchid	*Cryptostylis hunteriana*	-	Vulnerable
Wedge-leaf Tuckeroo	*Cupaniopsis shirleyana*	-	Vulnerable
Boonah Tuckeroo	*Cupaniopsis tomentella*	-	Vulnerable
bluegrass	*Dichanthium setosum*	-	Vulnerable
Plunkett mallee	*Eucalyptus curtisii*	Near Threatened	-
	Fontainea venosa	-	Vulnerable
Square-stemmed myrtle	*Gossia gonoclada*	Endangered	Endangered
Cudgerie	*Hernandia bivalvis*	Near Threatened	-
-	*Leichhardtia coronata*	Vulnerable	-
Wandering Pepper-cress	*Lepidium peregrinum*	-	Endangered
Austral Cornflower, Native Thistle	*Leuzea australis (listed as Rhaponticum australe)*	-	Vulnerable
-	*Lilaeopsis brisbanica*	Endangered	-
Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak	*Macadamia integrifolia*	-	Vulnerable
Small-fruited Queensland Nut, Gympie Nut	*Macadamia ternifolia*	-	Vulnerable
Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut	*Macadamia tetraphylla*	-	Vulnerable
-	*Lilaeopsis brisbanica*	Endangered	-
-	*Melaleuca irbyana*	Endangered	-
Cooneana olive	*Notelaea ipsviciensis*	Critically Endangered	Critically Endangered
Lloyd's native olive	*Notelaea lloydii*	Vulnerable	Vulnerable
Hawkweed	*Picris evae*	-	Vulnerable
Shiny-leaved Condoo, Black Plum, Wild Apple	*Planchonella eerwah*	-	Endangered
Scrub Turpentine, Brown Malletwood	*Rhodamnia rubescens*	-	Critically Endangered
Native guava	*Rhodomyrtus psidioides*	Critically Endangered	Critically Endangered
Quassia	*Samadera bidwillii*	-	Vulnerable
	Sophora fraseri	-	Vulnerable
Hairy hazelwood	*Symplocos harroldii*	Near Threatened	-

Active Diurnal Herpetofauna Searches

Targeted Herpetofauna searches were undertaken over two (2) days on the 11th and 14th December 2020 for approximately 1 hour each day to target Threatened and Significant fauna species including the Collared Delma (*Delma torquata*) and the Tusked Frog (*Adelotus brevis*). The active searching involved scanning for active animals as well as turning rocks and logs, tin and other rubbish, searching leaf litter, bark and in crevices and other suitable microhabitat for cryptic animals. During these searches, other signs of animals (tracks, scats and other traces) were also recorded where they could confidently be attributed to a target species.

Call Playbacks for the locally significant Tusked Frog (*Adelotus brevis)*

Call playback surveys targeting *Adelotis brevis* were undertaken at a number of drainage line sites along the wetland transects. The surveys were undertaken over two (2) nights on the 11th and 14th December 2020. This involved playing the calls for a minimum of 2 minutes at each site in appropriate weather conditions (after rain) when numerous other amphibian species were recorded calling.

Call Playbacks for the Powerful Owl (*Ninox strenua)*

Call playback surveys targeting the Powerful Owl were undertaken over two (2) nights on the 1st and 2nd September 2021. The surveys commenced with a period of 5 minutes of Passive listening, followed by five 5 minutes of call broadcasts, followed by another 5 minutes of passive listening. Spotlighting was then undertaken for a period of approximately 30 minutes during which time any delayed responses could be heard.

Spotlighting Surveys and Passive Nocturnal Searches

Spotlighting surveys and Passive Nocturnal Searches were conducted on foot along a meandering transect across the entire site on two (2) non-consecutive nights (11th and 14th December 2020) by two (2) observers and subsequently on two (2) additional nights after the call playbacks for the Powerful Owl (1st and 2nd September 2021) for a period of approximately 30 minutes each night. The surveys were conducted through terrestrial habitats targeting; nocturnal arboreal mammals, geckoes, nocturnal snakes, nocturnal birds, and terrestrial mammals, then targeting creeks and drainage lines specifically scanning for active amphibians and reptiles identified through eyeshine or calls or movement.

Survey effort was split evenly between the two (2) habitat types and the location of specific transects are shown in **APPENDIX A**. The spotlighting/ Passive Nocturnal Searches conducted in November 2020 were undertaken for 65 and 60 minutes a night, totalling 250 person minutes for the site (4 person hours and 10 minutes) and for 30 minutes and 25 minutes respectively in September 2021 (55 minutes).

Targeted Koala Surveys and Assessments

Koala Spot Assessment Technique (KSAT)

Koala scat searches were undertaken in general accordance with the Koala Spot Assessment Technique (KSAT) adopted by Phillips and Callaghan (2011) by two (2) senior ecologists in November 2020 and one ecologist in September 2024. This methodology involves searching the basal circumference of suitable Koala food trees for evidence of utilisation by the Koala in the form of koala scats. Within each formal KSAT plot, a 'centre tree' was chosen, and along with this tree, an additional 29 trees within a radial circumference of the centre tree were searched for koala scats. A total of 30 trees were, therefore, searched within each formal KSAT plot, and each tree was searched for 2 (two) person minutes or until a koala scat was found, whichever came first. The diameter of the searched area was variable ranging between approximately 30m – 100m from the centre tree, depending upon the tree species and age classes (DBH).

In total, five (5) formal KSAT surveys were undertaken within the site in November 2020 and nine (9) formal KSATs were undertaken in September 2024. (**APPENDIX A**).

Koala Habitat Value Plots

Koala habitat assessments were undertaken in August 2021 using a plot based methodology devised to determine the Koala habitat values impacted by the proposed development and habitat values within the retained conservation and corridor areas.

The methodology was devised to provide a comparative formalised assessment of the habitat values of areas of the site using 50 x 50m Koala habitat value plots. derived from the BioCondition Assessment Manual and adopted the

definitions of Koala habitat trees and Non-Juvenile Koala Habitat Trees in accordance with the Queensland Environmental Offsets Policy (DES, 2021).

Koala habitat trees

a. food tree of the Corymbia, or Melaleuca, or Lophostemon or Eucalyptus genera; or

b. preferred shelter species such as Angophora genera.

Non-juvenile koala habitat tree is a koala habitat tree that has:

a. a height of more than four metres; or

b. a trunk with a circumference of more than 31.5 cm (100mm DBH) at 1.3 m above the ground.

The methodology was based on a 50m x 50m plot. All trees within the plots were identified and all Koala habitat trees (i.e. *Angophora, Eucalypts, Corymbia, Lophostemon* and *Melaleucas*) were counted. The number of trees of each species was tallied according to in separate DBH categories which aligned with:

- Non-Juvenile Koala Habitat Trees defined as 100mm DBH and/or >4m in height.
- Young - Mature Koala Habitat Trees defined as 150mm -300mm (used as smallest trees for KRAM method).
- Mature Koala Habitat Trees defined as 300mm -500mm.
- Over Mature Koala Habitat Trees defined as >500mm.

Each species was then assigned a tree species utility classification to rank the usefulness to koalas of every tree species occurring in the study area in accordance with the DES (2021) *Spatial modelling for koalas in South East Queensland* to allow comparison of density and age classes of High, Medium, Lower or none /unknown tree species utility within the proposed development footprint and the conservation areas.

Each tree was also searched for recent Koala scats and scratches in a manner consistent with Koala Rapid Assessment Methodology (KRAM) (Woosnam-Merchez, O, R. et al 2012). This method was selected as the site had previously been subject to thorough KSAT searches in November 2020 and surveys were targeting only recent use since the 2020 surveys to identify the relative frequency of use.

In total nine (9) Koala Habitat Value Plots were undertaken on 30th August 2021 by three (3) ecologists with four (4) plots undertaken within the proposed development area and five (5) plots undertaken within the retained areas of the site. The location of the plots are shown on the fauna survey site map (**APPENDIX A**).

Tree counts within each plot were used to calculate the average per hectare number of NJKHTs within the proposed disturbance footprint and within the proposed retention area. These calculations were undertaken to form a basis for future calculations of the proposed development's Significant Residual Impact on NJKHTs.

Diurnal Bird Surveys

Diurnal Bird Surveys were conducted on foot along a meandering transect across the entire site on four (4) non-occasions targeting Threatened species such as the Brown Treecreeper and Glossy Black Cockatoo during the surveys undertaken in September/October 2024 by one observer. The surveys were generally conducted in accordance with the survey guidelines for threatened birds with approximately 1 hour per day conducted in the early morning over 4 days. In addition all birds observed or identified by calls during the course of other survey types were recorded.

3.2.5 Exotic Flora and Fauna Surveys

Non-native flora and fauna species were recorded when encountered during the survey (i.e. in survey plots, during targeted searches and opportunistically during site traverses) to produce a cumulative non–native flora and fauna list for the site. This included restricted matters (invasive plants and animals) scheduled under the Biosecurity Act 2014, as well as Weeds of National Significance (WoNS).

3.2.6 Disturbance Surveys

Disturbance data was recorded at each formal vegetation survey plot, and opportunistically during site traverses at the discretion of the ecologist. At each disturbance survey site, frequency and severity were assessed and recorded for the following disturbance categories:

- Blade ploughing;
- Erosion;

- Fence lines;
- Fire breaks;
- Flooding;
- Grazing;
- Logging;
- Mechanical clearing;
- Prescribed burning;
- Thinning;
- Wild fire;
- Wind storm; and
- Vehicular track.

3.2.7 Opportunistic Flora and Fauna Searches

To maximise data collection across the range of vegetation and habitats present, site traverses were conducted on foot. This facilitated a higher sampling resolution for the field survey and enabled greater site coverage by the field ecologist, which increases the likelihood of detecting threatened species and potentially threatened species habitat.

3.2.8 Data Collection Protocol

All positional, quantitative, qualitative, and photographic data was recorded using Konect® data capture software using proprietary electronic forms for the recording of specific ecological data. A combination of smartphones and Trimble® data capture unit was used to run the data capture software. The spatial accuracy of ± 5 m is generally achieved using the data capture process described.

3.2.9 Survey Limitations

Whilst a range of variation has been assessed throughout all vegetation communities encountered on-site, the entirety of each community has not been investigated at a fine level of detail. For example, cryptic flora species that occur within the region that may only be detectable during their flowering period may not have been observed during the current survey period. Consequently, whilst a diversity of flora species has been recorded, the inventory of flora species compiled from the survey should not be considered an exhaustive list of flora species within the site.

It should also be noted that the fauna component of the field survey was a rapid assessment that provides a ‘snapshot’ of the species present and detectable at the site at the time of the survey. The survey was undertaken in Spring/Summer 2020, Winter/Spring 2021 and Spring 2024 and therefore does not account for the full range of seasonal habitat utilisation by, or detectability of, every fauna species that may utilise the site, nor does it account for the influence of weather during preceding seasons or years upon the presence or detectability of fauna during the survey. Aquatic trapping surveys did not form part of the survey scope.

Chapter 4: Results

4.1 Desktop and Literature Review – Local Government Mechanisms

TABLE 4.1 below presents the results of the desktop review of the provisions of the Ipswich Planning Scheme (2006) as they relate to the ecological planning context of the site and the development. Here it is noted that, while the development has been approved by Council, desktop review results of MLES are presented to provided context around the site.

TABLE 4.1: DESKTOP REVIEW OF MATTERS OF LOCAL ENVIRONMENTAL SIGNIFICANCE

PLANNING SCHEME ELEMENT	DESIGNATION/ CLASSIFICATION	COMMENTS
Zoning	The majority of the site is in the Large Lot Residential (LLR) zone, while a strip along the southern boundary is within the Recreation (REC) zone. Refer to **APPENDIX C** for the zone map. The LLR zone is shaded pink, while the REC zone is shaded in green.	As per Part 4 of the Planning Scheme, specific outcomes for residential uses in the Large Lot Residential Zone include: *Uses and works that reflect the established built character, maintain amenity and protect and enhance important townscape and landscape elements within local areas having regard to* (factors including) *vegetation protection.* As per Part 12 of the Planning Scheme, the overall outcomes sought for the Recreation Zone include the following— *(a) The Recreation Zone provides for the development of an integrated open space network including the use of land for—* *(i) both active and passive recreation opportunities within parks;* *(ii) linear/riparian corridors as open space links; and* *(iii) private and public sporting/recreation facilities.*
OV4 – Difficult Topography	The southern and eastern portions of the site are designated as hosting slopes of >25 % (yellow shading of OV4 map extract as presented in **APPENDIX C**), 20-25% (pink shading) and 15-20% (blue shading).	The Difficult Topography Overlay Code (s11.4.6) of the Planning Scheme applies to development within areas of the site that are >15% in slope.
OV5 – Urban Catchment Flow Paths Map Excerpt	The drainage gullies of the site's central portion are designated as Urban Catchment Flow Paths pursuant to OV5 (**APPENDIX C**).	The Flooding and Urban Catchment Flow Paths Overlay Code (s11.4.7(e)) of the Planning Scheme applies the proposed to development.

4.2 Desktop and Literature Review – State Government Mechanisms

TABLE 4.2 below presents the results from the desktop review of Matters of State Environmental Significance that relate to the subject site. Here it is noted that, while the development has been approved by the Queensland Government, desktop review results of MSES are presented to provided context around the site.

TABLE 4.2: DESKTOP REVIEW OF MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

STATE ENVIRONMENTAL MATTER	DESIGNATION/DESCRIPTION	COMMENTS
Koala Habitat Areas and Koala State Planning Regulatory Provisions	The majority of the site is mapped as Koala Habitat Area (KHA) pursuant to Queensland Government Koala Plan mapping (**APPENDIX D**). The KHA-designated area of the site coincides with the regulated vegetation designation of the site (refer to row below). A total of 10.95 ha (or 95.8%) of the site is designated as KHA.	The proposed development has been approved by the State Government pursuant to the State Development Assessment Provisions of State Code 25. State Code 25 requires that development provides for koala movement conduits, koala shelter resources and koala-sensitive design. In addition, a potential requirement for environmental offsets is called up by State Code 25. Here it is noted that koala habitat is defined by the *Nature Conservation (Koala) Conservation Plan 2017* as: a) An area of vegetation in which koalas live and that includes a koala habitat tree; b) An area of vegetation that consists primarily of koala habitat trees and which is reasonably suitable for sustaining koalas; or c) a partially or completely cleared area used by koalas to cross from an area mentioned in paragraph (a) or (b) to another area mentioned in paragraph (a) or (b).

TABLE 4.2: DESKTOP REVIEW OF MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

STATE ENVIRONMENTAL MATTER	DESIGNATION/DESCRIPTION	COMMENTS
		Koala habitat tree is defined by the *Nature Conservation (Koala) Conservation Plan 2017* as: a) a tree of the Corymbia, Melaleuca, Lophostemon or Eucalyptus genera that is edible by koalas; or b) a tree of a type typically used by koalas for shelter, including, for example, a tree of the Angophora genus.
Regulated vegetation and Essential Habitat	Much of the site is designated as Category B regulated vegetation. This Category B designation pertains to the Least Concern Remnant regional ecosystem (RE) 12.9-10.2 designation of the site (**APPENDIX D**). The Category B designated area of the site is also designated as Essential Habitat for koala (**APPENDIX D**). This is consistent with the Koala Habitat Areas mapping described in the respective row above.	As described in section 4.4, the regulated vegetation-designated areas of the site were found to conform with the *Vegetation Management Act 1999* definition of remnant regional ecosystem.
Protected Plants	The area of the site mapped as regulated vegetation is also designated as High-Risk Area under the Protected Plants Flora Survey Trigger Map (DESI, 2024) (**APPENDIX D**).	Since the site is mapped as a High Risk Area, the development of the site will trigger the requirement for a clearing/exemption permit pursuant to the NC Act. This involves a targeted flora survey of the proposed disturbance footprint plus a buffer area of 100 m. While targeted threatened flora surveys have been conducted over the site on several occasions, since clearing permits/exemption notifications have a three (3) year currency period from the date at which the Protected Plants flora survey is completed, As such, additional surveys will be required in the lead up to disturbance works.
Wildlife online	A total of seven (7) fauna species and eight (8) flora species, which are listed as Critically Endangered, Endangered, Vulnerable or Near Threatened (EVNT) were recorded in the Wildlife Online database as potentially present within the site (**APPENDIX D**).	As discussed in **section 4.4**, traces (scratches and scats) of koala (Endangered under NC Act) were recorded during site surveys. No other threatened species were recorded on site. Refer to **Chapter 5** for a review of impacts for subject species tables which present an assessment of the likelihood of occurrence and anticipated nature of the impact of the proposed development upon threat-listed species.
Waterways for Waterway Barrier Works	The drainage gullies of the site are not designated as Waterways for Waterway Barrier Works as defined under the *Fisheries Act 1994*.	The proposed waterway crossing does not trigger State Government concurrence agency assessment in relation to Waterway Barriers in accordance with schedule 10, part 6 of the *Planning Regulation 2017.*

4.3 Desktop and Literature Review – Federal Government Mechanisms

TABLE 4.3 below presents the results from the desktop review of Matters of National Environmental Significance. Refer to **APPENDIX E** for raw search results.

TABLE 4.3: DESKTOP REVIEW OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

NATIONAL ENVIRONMENTAL MATTER	DESIGNATION/DESCRIPTION	COMMENTS
Listed Threatened Ecological Communities (TECs).	The search returned seven (7) TECs as likely to occur within 10km of the site area: • Lowland Rainforest of Subtropical Australia • Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland • Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland	No TECs were recorded on site during New Ground survey works. All TECS potentially occurring in the area are detailed in the Ecological Community likelihood of occurrence table.

TABLE 4.3: DESKTOP REVIEW OF MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

NATIONAL ENVIRONMENTAL MATTER	DESIGNATION/DESCRIPTION	COMMENTS
	ecological community • White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland • Poplar Box Grassy Woodland on Alluvial Plains • Grey box-grey gum wet forest of subtropical eastern Australia Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	
Listed Threatened Species.	A total of 85 listed threatened species are potentially present within the survey area. Refer to **Table 6.1** for an assessment of the likelihood of occurrence and anticipated nature of the impact of the proposed development upon threat-listed species.	As discussed in section 4.4, traces (scratches and scats) of koala (Endangered under EPBC Act) were recorded during site surveys. No other threatened species were recorded on site. At the time of lodgement of the Development application the Koala was listed as Vulnerable pursuant to the EPBC Act. A review of the projects impacts was assessed against the Referral Guideline for the Vulnerable (2012), and the proposed development (given its scale) was not deemed to offer an adverse effect on habitat critical to the survival of the koala and as such, did not trigger a referral to the Federal Department of Agriculture, Water and the Environment (DAWE). Following the change in the status of the Koala pursuant to the EPBC act from Vulnerable to Endangered the potential for significant impact was reassessed in accordance with Guideline 1.1 and the proposed activity was potentially determined to result an adverse effect on habitat critical to the survival of the koala and as such, additional surveys and assessments were undertaken and this EAR was prepared to accompany a referral to the Department of Climate Change, Energy, the Environment and Water (DCCEEW). Refer to **section 5** for a review of impacts.
Listed Migratory Species.	A total of 34 listed migratory species are potentially present within the survey area.	The proposed development is not anticipated to offer a significant impact on a Federal-listed migratory species as per EPBC Act Policy 1.1.

4.4 Field Survey Results

4.4.1 Vegetation Community Surveys

TABLE 4.4 provides a summary of the ground-truthed vegetation communities verified during the field survey. **APPENDIX F** presents a map of the vegetation communities over the site, while **APPENDIX G** presents flora species listed on site and **APPENDIX H** presents representative photographs of the site.

TABLE 4.4: GROUND-TRUTHED VEGETATION COMMUNITIES PRESENT ON SITE

COMMUNITY	COMMUNITY DESCRIPTION
Open Forest	Open forest (PFC 30-70%, 18-22m high) generally dominated by *Eucalyptus mollucana* and *Corymbia citriodora with E. crebra, Angophora leiocarpa, E. major* and *E. siderophloia. E. tereticornis and Lophostemon suaveolens* are also represented in gullies. Shrub layer (PFC,10-30%, 2- 5m high) dominated by *Acacia spp., and Alphitonia excelsa* with *Allocasuarina littoralis* and *L. suaveolens*. Ground layer (10-30% cover,<1m high) of *Ochna serrulata*, Lantana montevidensis*, Megathyrsus maximus*, Lantana camara*, Themeda australis, Entolasia stricta, Cymbopogon refractus, Paspalum sp.* and *Lepidosperma laterale. Xanthorrhoea johnsonii* represented at the site's east. Floristics, canopy height and canopy cover resemble Least Concern Remnant Regional Ecosystem 12.9-10-2 as described by the Queensland Herbarium Technical Description for this RE (DSITIA, 2012).
Non-remnant Mosaic	Mosaic of existing built infrastructure (i.e. shed), derived grassland (along site's eastern boundary) (including *M. maximus*, Melinis repens*, Setaria sphacelata*, Paspalum sp.*, *Imperata cylindrica*). Regenerating open forest (RE12.9-10.2) at site's southern boundary Designated non-remnant (category X) vegetation under PMAV 2020/012252.

4.4.2 Fauna Habitat Assessment

The fauna habitat assessment recorded one (1) broad habitat type (associated with RE12.9-10.2) within the site. This was aligned with vegetation community descriptions recorded over the site and also included ephemeral aquatic habitat associated within the site's waterway corridor. Representative surveys were undertaken across the site and the survey locations are presented in **APPENDIX A** and representative photos are presented in **APPENDIX H. TABLE 4.5** presents a summary of the habitat survey results and a description of the microhabitat features recorded within each habitat type.

TABLE 4.5: FAUNA HABITAT ASSESSMENT SURVEY FINDINGS

HABITAT SURVEY	EXTENT OF OCCURRENCE	DESCRIPTION
Habitat Survey 1 (H1)	The area of habitat associated with Habitat Survey 1 occurs in the area of the site's southwest classified as 'Open Forest 12.9-10.2' in the ecological features map (**APPENDIX F**).	The noted habitat values associated with this survey site are: • 26-50% flowering or fruiting trees cover • >76% leaf litter and sticks ground cover; • <25% vegetated ground cover; • >10 decorticating trees or logs; • 1-5 small rocks (<200mm diameter); • > 10 medium rocks (200-500mm diameter); and • <100m from an aquatic habitat feature.
Habitat Survey 2 (H2)	The area of habitat associated with Habitat Survey 2 occurs in the area of the site classified as 'Open Forest 12.9-10.2' in the ecological features map in the ecological features map (**APPENDIX F**).	The noted habitat values associated with this survey site are: • 26-50% flowering or fruiting trees cover • 1-10 small rocks (<200mm diameter); • 1-5 termite mounds in trees; • 1-10 decorticating trees or logs; • 1-5 stags; and • <100m from an aquatic habitat feature.
Habitat Survey 3 (H3)	The area of habitat associated with Habitat Surveys 3 occurs in the area of the site classified as 'Open Forest 12.9-10.2' in the ecological features map (**APPENDIX F**).	The noted habitat values associated with this survey site are: • 26-50% flowering or fruiting trees cover • 26-50% leaf litter and sticks ground cover; • <25% vegetated ground cover • >10 logs with <300 mm diameter; • 1-10 decorticating trees or logs; • 1-5 termite mounds in trees; and • <100m from an aquatic habitat feature.

TABLE 4.5: FAUNA HABITAT ASSESSMENT SURVEY FINDINGS

HABITAT SURVEY	EXTENT OF OCCURRENCE	DESCRIPTION
Habitat Survey 4 (H4)	The area of habitat associated with Habitat Survey 4 occurs in the area of the site classified as 'Open Forest 12.9-10.2' in the ecological features map (**APPENDIX F**).	The noted habitat values associated with this survey site are: • <25% flowering or fruiting trees cover • 1-5 hollow-bearing logs (small hollows <35 mm diameter); • >76% leaf litter and sticks ground cover; • <26-50% vegetated ground cover; and • <100m from an aquatic habitat feature.
Habitat Survey 5 (H5)	The area of habitat associated with Habitat Survey 5 occurs in the area of the site classified as 'Open Forest 12.9-10.2' in the ecological features map (**APPENDIX F**).	The noted habitat values associated with this survey site are: • 26-50% flowering or fruiting trees cover • 51-75% leaf litter and sticks ground cover; • >10 logs with <300 mm diameter; • >10 small rocks (<200mm diameter); and • <100m from an aquatic habitat feature.
Habitat Survey 6 (H6)	The area of habitat associated with Habitat Surveys 6 occurs in the area of the site classified as 'Open Forest 12.9-10.2' in the ecological features map (**APPENDIX F**).	The habitat values noted at this survey site are: • <25% flowering or fruiting trees cover; • 26-50% vegetated ground cover; • >76% leaf litter and sticks ground cover; • 1-5 hollow-bearing logs (small hollows <35 mm diameter); • >10 logs with <300 mm diameter; • 1-5 small rocks (<200mm diameter); • 1-5 medium rocks (200-500mm diameter); • <100m from an aquatic habitat feature; and • 1-5 termite mounds in trees.
Habitat Survey 7 (H7)	The area of habitat associated with Habitat Surveys 7 occurs in the area of the site classified as 'Open Forest 12.9-10.2' in the ecological features map (**APPENDIX F**).	The habitat values noted at this survey site are: • <25% flowering or fruiting trees cover; • 26-50% vegetated ground cover; • >76% leaf litter and sticks ground cover; • >10 logs with <300 mm diameter; • >10 decorticating trees or logs; • >10 small rocks (<200mm diameter); • >10 medium rocks (200-500mm diameter); • 6-10 large rocks (>500mm diameter); • <100m from an aquatic habitat feature; and • 1-5 termite mounds in trees.

4.4.3 Fauna Breeding Place Features Survey

During the breeding habitat survey, a total of 12 records were collected, all identified as potential breeding places. The locations of the potential fauna breeding habitat features are presented in **APPENDIX F** and representative photos are presented in **APPENDIX H**. **TABLE 4.6** below contains a tabulated summary of the fauna breeding habitat place survey findings.

TABLE 4.6: FAUNA BREEDING PLACE FEATURES SURVEY RESULTS

BREEDING PLACE ID #	ECOLOGICAL FEATURES	DETAILS OF ECOLOGICAL FEATURES	SUITABLE FAUNA	GPS COORDINATES	
				EASTING	NORTHING
BP1	Hollow-bearing stag	DBH ~80cm, Hollow diameter 20cm	Potential breeding place for arboreal mammals (such as gliders and possums), hollow-dependant birds (such as lorikeets, parrots, owls, treecreepers) microbats and arboreal/scansorial reptiles	-27.62249239	152.894747
BP2	Hollow-bearing tree	Hollow <20cm, Koala scratches	Potential breeding place for arboreal mammals (such as gliders and possums), hollow-dependant birds (such as lorikeets, parrots, owls, treecreepers) microbats and arboreal/scansorial reptiles	-27.62289588	152.8946161
BP3	Hollow-bearing tree	E.molluccana, 1m dbh, Hollows in branches (<20cm)	Potential breeding place for arboreal mammals (such as gliders and possums), hollow-dependant birds (such as lorikeets, parrots, owls, treecreepers) microbats and arboreal/scansorial reptiles	-27.62240587	152.895116
BP4	Hollow-bearing tree	Hollows (<20cm)	Potential breeding place for arboreal mammals (such as gliders and possums), hollow-dependant birds (such as lorikeets, parrots, owls, treecreepers) microbats and arboreal/scansorial reptiles	-27.62261	152.896844
BP5	Hollow-bearing stag	Hollow branches (<10cm)	Potential breeding place for arboreal mammals (such as gliders and possums), hollow-dependant birds (such as lorikeets, parrots, owls, treecreepers) microbats and arboreal/scansorial reptiles	-27.62295122	152.896719
BP6	Hollow-bearing stag	Potential small hollows in upper branches (<10cm)	Potential breeding place for arboreal mammals (such as gliders and possums), hollow-dependant birds (such as lorikeets, parrots, owls, treecreepers) microbats and arboreal/scansorial reptiles	-27.62303664	152.8969139
BP7	Hollow-bearing tree	Multiple hollows 30cm diameter & 10cm diameter	Potential breeding place for arboreal mammals (such as gliders and possums), hollow-dependant birds (such as lorikeets, parrots, owls, treecreepers) microbats and arboreal/scansorial reptiles	-27.62324647	152.8979665
BP8	Rock pile	30m x 30m area of rocks (0.4m-1m long)	Potential breeding place for reptiles (snakes and lizards)	-27.622738	152.898514
BP9	Burrow	Lace monitor burrow	Potential breeding place for ground-dwelling mammals (such as echidnas and rodents) and reptiles (snakes and lizards)	-27.62271851	152.8986446
BP10	Hollow-bearing stag	Small hollows in branches (<10cm)	Potential breeding place for arboreal mammals (such as gliders and possums), hollow-dependant birds (such as lorikeets, parrots, owls, treecreepers) microbats and arboreal/scansorial reptiles	-27.62243191	152.8988655
BP11	Hollowed termite mound	-	Potential breeding place for arboreal mammals (such as gliders and possums), hollow-dependant birds (such as lorikeets, parrots, owls, treecreepers) microbats and arboreal/scansorial reptiles	152.8966869	-27.62160977
BP12	Hollow-bearing stag	Hollow crevices in trunk (30cm diameter x 4m)	Potential breeding place for amphibians and aquatic fauna (such as fish and crustaceans)	152.8971951	-27.62221045

4.4.4 Fauna and Flora Surveys

A total of 59 species of flora were recorded during the survey. Of these, 40 species are listed as Least Concern flora and one (1) species (*Xanthorrhoea johnsonii)* is a Special Least Concern species under the NC Act. Sixteen of the recorded flora species are exotic species and/or environmental weeds. Of the exotic species recorded, three (3) are category 3 restricted matters under the Biosecurity Act 2014 and listed by the Federal Government as Weeds of National Significance (WoNS). Locally significant flora was not recorded on the site as discussed in **section 4.4.5**.

A total of 49 fauna species were detected on site comprising of; 33 avifauna and five (5) mammal species, nine (9) amphibian species and two (2) reptile species. Of these records, two (2) of the recorded species are exotic.

Listed Flora and Fauna Species

No species listed as Locally Significant in the Ipswich Council Area were recorded. (See sections 4.4.5 and 4.4.6 for further detail).

One mammal species the Koala was recorded from both scats and scratch marks during formal KSAT and KRAM surveys. The Koala (*Phascolarctos cinereus*) is listed as Endangered under the EPBC Act and under the NC Act. The fauna list is not an exhaustive list of species located in the area, rather, a list of species that were encountered during the survey. Refer to sections 4.4.5 and 4.4.6 for further detail.

APPENDIX G presents the list of flora and fauna detected on site during the survey.

Targeted Flora surveys

No Threatened or locally significant flora species were recorded during the Targeted Threatened Flora surveys undertaken in September 2021 or September/October 2024.

Active Diurnal Herpetofauna Searches

The active diurnal searching only detected two (2) additional species not detected during other survey methods, the Common Garden Skink (*Lampropholis guichenoti*) and the Striped Snake-eyed Skink (*Cryptoblepharus virgatus sensu lato*).

Combined Spotlighting Surveys and Passive Nocturnal Searches

The combined spotlighting surveys and passive nocturnal herpetofauna searches detected a total of nine (9) amphibian species including the introduced cane toad, one (1) bird species the Tawny Frogmouth (*Podargus strigoides)* and one (1) mammal the Common Brushtail Possum (*Trichosurus vulpecula*). Flying Foxes were observed overhead, however, were overflying the site and too high to identify to species level and hence have not been recorded in the fauna list for the site. No Threatened species or Locally Significant species were detected over a total of five (5) nights of spotlighting.

Call Playbacks for the locally significant Tusked Frog (*Adelotus brevis)*

Despite excellent conditions, no Tusked Frogs (*Adelotis brevis*) were recorded during the call playback surveys or searches.

Call Playbacks for the Powerful Owl (*Ninox strenua)*

The call playbacks for the Powerful Owl (*Ninox strenua*) did not elicit any responses from the species and the species was not observed during the additional spotlighting period after these call broadcasts. Notwithstanding, the call broadcasts did elicit the response from two owl species approximately 200m-500m from the site, the Southern Boobook (*Ninox novaeseelandiae*) and the Barn Owl (*Tyto alba*).

Diurnal Bird Surveys

The Diurnal Bird Surveys (in conjunction with previous opportunistic bird identifications) detected a total of 33 species of Avifauna utilising the site and adjoining environs. No threatened Avifauna species have been recorded on or adjoin the site.

Targeted Koala Searches and habitat values

The Koala (*Phascolarctos cinereus*) was identified during the surveys through the detection of both scats and scratches during the formal KSAT surveys undertaken in November 2020, the KRAM searches undertaken during the Koala Habitat Values Plots undertaken in August 2021 and subsequent KSAT surveys undertaken in September 2024 (**APPENDIX A**). Refer to **APPENDIX F** for the location of koala scat records and **APPENDIX H** for photographs.

KSAT Results

TABLE 4.7 summarises the results of KSAT surveys undertaken over the site in 2020, while **TABLE 4.8** presents 2024 KSAT surveys. Activity levels were calculated for each survey site using the methodology associated with the KSAT methodology.

TABLE 4.7: 2020 KSAT SURVEY RESULTS

KSAT SITE	TREES WITH KOALA SCATS	ACTIVITY LEVEL BASED ON SCATS	ACTIVITY LEVEL CLASSIFICATION EAST COAST (MED –HIGH)#
KSAT 1	4	13.3%	Low
KSAT 2	1	3.3%	Low
KSAT 3	2	6.6%	Low
KSAT 4	1	3.3%	Low
KSAT 5	2	6.6%	Low

Note: # - Phillips and Callaghan (2011)

During the KSAT surveys conducted in 2020, differing aged of scats (based on visual interpretation of decomposition) and previous longer-term evidence of scratches were identified within the site which, anecdotally indicated that the site had been used occasionally separated by long periods i.e. 6 -12months, however the number of scats and density of scratches was low with only small numbers of scats detected.

The activity levels based on the KSATs were determined to be low in accordance with Phillips and Callaghan (2011) ranging from 3.3% (a single tree with scats from 30 trees) to 13.3% (4 trees with scats) as follows;

- Two (2) sites KSAT 2 and KSAT 4, both recorded scats at one (1) single tree (from 30 searched) equating to a 3.3% activity level, both these KSAT sites occurred within the development footprint (see **APPENDIX A**).
- At both KSAT 3 and KSAT 5, two (2) trees were recorded with two (2) scats equating to an activity level of 6.6%. KSAT 3 was undertaken within the development footprint while KSAT 5 was undertaken in the retained conversation and corridor area in the west of the site.
- The highest activity was recorded in the east west corridor at KSAT 1 with an activity level of 13.3% based on 4 trees with scats detected.

TABLE 4.8: 2024 KSAT SURVEY RESULTS

KSAT SITE	TREES WITH KOALA SCATS	ACTIVITY LEVEL BASED ON SCATS	ACTIVITY LEVEL CLASSIFICATION EAST COAST (MED –HIGH)#
KSAT 1	1	3.3%	Low
KSAT 2	3	10.0%	Low
KSAT 3	4	13.3%	Low
KSAT 4	1	3.3%	Low
KSAT 5	3	6.6%	Low
KSAT 6	0	0%	Nil
KSAT 7	0	0%	Nil
KSAT 8	0	0%	Nil

TABLE 4.8: 2024 KSAT SURVEY RESULTS

KSAT SITE	TREES WITH KOALA SCATS	ACTIVITY LEVEL BASED ON SCATS	ACTIVITY LEVEL CLASSIFICATION EAST COAST (MED –HIGH)#
KSAT 9	7	23.3	Medium

The additional KSAT surveys conducted in September 2024 obtained similar results to the previous surveys of 2020 recording differing aged scats (indicating usage on at least two occasions since previous surveys. Similar to the 2020 results, the number of scats at each tree was generally low and activities levels across the site varied, however were generally low for most KSATs, but ranged from zero activity to one plot with medium usage.

The results show that the activity levels based on the KSATs were;

- Zero usage recorded at three (3) KSAT sites,
- Low at five (5) KSAT sites, ranging from 3.3% (a single tree with scats from 30 trees) to 13.3% (4 trees with scats);
- Medium at KSAT 9 with an activity level of 23.3% based on 7 trees with confirmed scats detected.

Similar to the 2020 results the Koala activity demonstrated that, although most of the site is used sporadically, the Conservation Area consistently had the higher utilisation.

Koala Habitat Values Plot Results - Non Juvenile Koala Habitat Trees (NJKHTs)

The results of the Koala Habitat Values Plots are summarised in **TABLE 4.9** and **TABLE 4.10**. **TABLE 4.9** provides the raw number of Non Juvenile Koala Habitat Trees (NJKHTs) according to maturity /age cohorts based on DBH recorded in each plot to provide an age /maturity and density reference for plots within the proposed development footprint and within the proposed conservation areas. Refer to **APPENDIX A** to view the location of each plot referenced in **TABLE 4.9** and **TABLE 4.10**.

TABLE 4.9: KOALA HABITAT VALUES PLOT RESULTS – AGE CLASSES

NJKHTS BY SIZE COHORT (DBH)	PLOTS WITHIN PROPOSED DEVELOPMENT FOOTPRINT				PLOTS WITHIN CONSERVATION AREAS				
	PLOT 1	PLOT 2	PLOT 3	PLOT 6	PLOT 4	PLOT 5	PLOT 7	PLOT 8	PLOT 9
100-150mm or >4m high	27	26	33	76	99	62	97	106	117
150-300mm	39	42	25	32	42	63	21	19	30
300-500mm	11	7	8	5	8	4	1	5	6
>500mm	1	1	3	3	1	1	2	5	3
Total Number of NJKHTs	**78**	**76**	**69**	**116**	**150**	**130**	**121**	**135**	**156**

The results of the Koala Habitat Values Plot presented in **TABLE 4.9** show that there is a marked difference in the number and density of NJKHTs within the proposed development footprint and within the conservation areas. The plots in the development footprint ranged between 69 – 116 NJKHTs, compared to a range of 121 to 156 NJKHs in the conservation areas.

Analysis of the age (DBH) cohorts demonstrates:

- little difference in the Large Mature tree density (500mm+) -range 1-3 vs 1-5, between the development and conservation areas respectively;
- a minor increase in mature trees (300-500mm) in the development footprint, range 5-11 vs 1-8;
- Similar numbers in young trees (150 - 300mm) - range 25-42 vs 21-63 between the development and conservation areas respectively; and
- A much greater regeneration potential in the conservation area based on higher numbers of small DBH trees 100mm-150mm, with the development areas having a range of only 26 -76 trees and the conservation areas recording between 62 and 117 trees in this cohort.

This overall number of NJKHTs was found to be higher in all plots in the conservation area (range 121 -156) compared to the development area (range 69 -116). The average number of NJKHTs in plots within the development area was 339 per hectare; while the average number of NJKHTs in the plots within proposed retention/conservation areas was 553.6 per hectare.

TABLE 4.10 provides the NJKHTs recorded in each plot and whether each of the plots occurs within either the proposed development footprint or within the conservation areas. Each recorded tree species has been assigned a Tree utility category in accordance with DES (2021) *Spatial modelling for koalas in South East Queensland: Report v2.0* and, the number and percentage of trees of each utility class has been provided.

TABLE 4.10: KOALA HABITAT VALUES PLOT RESULTS – DIVERSITY AND UTILITY

NJKHTS AND UTILITY CATEGORIES	PLOTS WITHIN PROPOSED DEVELOPMENT FOOTPRINT				PLOTS WITHIN CONSERVATION AREAS				
	PLOT 1	PLOT 2	PLOT 3	PLOT 6	PLOT 4	PLOT 5	PLOT 7	PLOT 8	PLOT 9
Number of NJKHTs	78	76	69	116	150	130	121	135	156
Koala tree diversity	6	5	4	7	5	7	5	7	6
Lower Utility trees	24	47	15	79	43	93	32	94	56
Medium Utility trees	47	29	54	36	85	27	63	35	63
Higher utility trees	7	0	0	1	22	10	26	6	37
Lower Utility trees %	30.8	61.8	21.7	31	28.7	71.5	26.4	69.6	35.9
Medium Utility trees %	60.3	38.2	78.3	68.1	56.7	20.8	52.1	25.9	40.4
Higher Utility trees %	9.0	0	0	0.9	14.7	7.7	21.5	4.4	23.7

The results of the Koala Habitat Values Plot presented in **TABLE 4.10** show that tree diversity was similar in the conservation areas with five (5), six (6) or seven (7) Koala tree species occurring, compared to the development footprint. However, one (1) plot in the development area had only four (4) species.

In terms of tree utility, there was a significantly greater proportion of higher utility tree species, “primary” tree species such as *Eucalyptus tereticornis* and *E. major/ propinqua* within the conservation area than the development area.

Koala Habitat Values Plot Results – Locally Important Koala Trees (LIKT) and Ancillary trees

The Koala habitat plot data was subsequently assessed against the Locally Important Koala Trees (LIKT) and Ancillary trees listed for South east Queensland as per Youngentob, K.N et al (2021) “A review of koala habitat assessment criteria and methods”

TABLE 4.11: KOALA HABITAT VALUES PLOT RESULTS – LIKT & ANCILLARY TREES

NJKHTS BY SIZE COHORT (DBH)	PLOTS WITHIN PROPOSED DEVELOPMENT FOOTPRINT				PLOTS WITHIN CONSERVATION AREAS				
	PLOT 1	PLOT 2	PLOT 3	PLOT 6	PLOT 4	PLOT 5	PLOT 7	PLOT 8	PLOT 9
Number of LIKT	51	28	54	27	107	27	136	39	100
Percentage of LIKT	65.38%	36.84%	78.26%	23.28%	71.33%	20.93%	80.95%	28.89%	64.10%
Number of Ancillary	27	48	15	89	43	102	32	96	56
Percentage of Ancillary	34.62%	63.16%	21.74%	76.72%	28.67%	79.07%	19.05%	71.11%	35.90%
Average LIKT trees/ plot	**40**				**81.8**				
Average of Ancillary/plot	**44.75**				**65.8**				

The analysis of the Koala habitat plot data demonstrates that both for LIKT and Ancillary trees the average number of trees in both categories was significantly higher in the plots undertaken in the Conservation area when compared to average densities in the proposed development footprint.

As such in all measures of Koala tree density such as NJKHTs, Koala tree utility, LIKTS and Ancillary trees was found to be higher in all plots in the conservation area than the development footprint.

KRAM Results

The rapid scat searches undertaken detected only four (4) trees with scats. These scats based on age indicate that Koalas had utilised the site since the 2020 KSAT surveys. Scats were found in two (2) plots only – with scats detected under two trees in each plot (> 50 trees searched). The location of scats are shown on the ecological features map in **APPENDIX F.** Based check on the low detection, the activity level is considered low. Further, based on the sporadic nature of the scat detection it is likely that the usage is a transient individual.

4.4.5 Exotic Fauna and Flora Survey

During the field survey, three (3) flora species listed as a restricted matter under the *Biosecurity Act 2014* and WoNS species were recorded on site (refer **to TABLE 4.12**). A cumulative list of non-native flora species recorded on site during the field survey is provided in **APPENDIX G.** No introduced or invasive animals under the *Biosecurity Act 2014* were recorded on site.

TABLE 4.12: EXOTIC FLORA AND FAUNA RECORDED ON SITE

SCIENTIFIC NAME	COMMON NAME	RESTRICTED CATEGORY NUMBER	WONS
FLORA			
Asparagus aethiopicus	asparagus fern	Category 3	WoNS
Chloris gayana	Rhodes grass	-	-
Hypochaeris radicata	flat weed	-	-
Ipomoea purpurea	morning glory	-	-
Lantana camara	lantana	Category 3	WoNS
Lantana montevidensis	trailing lantana	Category 3	WoNS
Melinis repens	red natal grass	-	-
Ochna serrulata	ochna	-	-
Paspalum dilatatum	paspalum	-	-

4.4.6 Disturbance

A number of disturbance types were recorded on site. These are detailed in **TABLE 4.13** below.

TABLE 4.13: SITE DISTURBANCES

DISTURBANCE TYPE	DESCRIPTION
Weed invasion	The level of weed invasion ranges from low to high and varies throughout the site. Along the site's edges, significant weed invasion is evident with Giant Guinea Grass (*Megathyrsus maximus*) dominating the flats associated with the drainage channel, the eastern portion of the site and along Church Street reserve impacting the diversity of the groundcovers in these areas. The drainage channel also supports some small dense patches of *Lantana camara*. Creeping Lantana *(Lantana montevindensis)* is also widespread in the groundcover and this has been observed in increase in density and extent across the site since 2022. It is not widespread across the site. *Ochna serrulata* is abundant in the understorey in patches across the site.
Internal fencing	There are no internal fences within the subject site contributing to the fragmentation of the landscape.
Rubbish	Along tracks that occur within the site, small piles of waste from illegal dumping was observed.
Earthworks	Apart from tracks, the site has not been subject to significant earthworks
Hydrological modification	The ephemeral drainage lines that occur in the site are largely unmodified.
Clearing	A review of historical aerial photography from 1980 demonstrates that the site has been subject to historical clearing and/or grazing and is evident on site by similar age classes of trees within the vegetation community across the site. Refer to **APPENDIX I** for the Historic Aerial Photo.

4.4.7 Site Connectivity and Corridors

A review of the site's role in local ecological connectivity was undertaken by New Ground to inform the development design process. New Ground referred to desktop data layers as well as field survey data documented within this report.

The site is bounded to the west by Church Street, to the east by Bertha Street and a cleared powerline easement to the south. While the two roads and powerline easement traverse this local corridor significant parcels of remnant regional ecosystem vegetation occur to the in Ric Natrass Conservation area to the east and Church Street reserve to the west. As a result the development was designed to maintain the significant corridor in the conservation area to provide connection to these areas. Refer to **APPENDIX J** for the Landscape Corridors and Connectivity Plan.

While the site is not considered or designated (refer **to TABLE 4.1**) as part of a regionally significant ecological corridor, it provides contiguous corridors to remnant vegetation to Camira and Springfield areas and provides stepping-stone corridor habitats for mobile species to the large remnants in the Greenbank Area.

Chapter 5: Overview of Impacts (MLES and MSES)

A summary of the potential ecological impacts and impact mitigation measures associated with the proposed development concept (**APPENDIX B**) is provided in the following section in order to guide development planning.

5.1 MLES and other Local Matters

Locally Significant Species

No Ipswich City Council Local Significant species were recorded on the subject site despite numerous targeted surveys undertaken on the site. Despite this, a small number of Local Significant fauna species such as the Tusked Frog (*Adelotis brevis*) Squirrel Glider (*Petaurus norfolcensis*) and Brush-tailed Phascogale (*Phascogale tapoatafa*) are considered as potentially occurring as part of the species' home range extents are in the site's locality. The site however offers little breeding or denning habitats for arboreal/ scansorial fauna as only a small number of hollow bearing trees were identified within the site during the numerous traverses undertaken. In total only nine (9) hollow bearing trees were identified in the site, and the majority of these occur in the areas retained for conservation. The two (2) ephemeral drainage lines provide limited potential habitat for the Tusked Frog which, if the species occurs downstream, would be limited to sporadic breeding during prolonged wet periods.

The proposed development would contribute to a cumulative reduction of potential foraging areas for these species. However, areas of intact habitat would be retained via retention of KHA and waterway corridor areas. On this basis, the proposed development is not anticipated to alone represent a significant impact on the local distribution and abundance of these species.

Habitat Features

There were 12 fauna breeding habitat features recorded on the site. The proposed development allows for the retention of six (6) of these, with the balance of six (6) fauna habitat features (BP1, BP3, BP10, BP11, BP12) to be removed. Accordingly, the proposed development will result in a decline in the abundance of potential fauna breeding places on the subject site. Compensatory habitat features (e.g. nest boxes installed within the area of vegetation to be retained onsite) are to be applied to mitigate the loss of habitat trees on site. Further, pre-clearing checks of any hollows to be removed will be required to mitigate the risk of disruption of breeding and fauna mortality.

5.2 MSES

Threatened Flora

No threat-listed flora species were recorded as occurring on site despite thorough targeted searches. Notwithstanding, several specimens of Special Least Concern species, *Xanthorrhoea johnsonii*, were recorded on site. The proposed development is anticipated to result in a reduction of abundance in this species on the subject site. Notwithstanding, the proposed development is not anticipated to alone represent a significant impact on the local distribution and abundance of this species.

Threatened Fauna

The Koala (*Phascolarctos cinereus*) listed as Endangered pursuant to the NC act was the only Threatened fauna species recorded on site. As the site is mapped as hosting Core Koala Habitat area pursuant to Sections 10 and 11 of the Nature Conservation (Koala) Conservation Plan 2017 assessment against State Code 25: Development in South East Queensland Koala Habitat Areas (State code 25, version 2.6) was triggered by the proposed development.

The development will result in the removal of Koala habitat which would result in a reduction in Koala sheltering and foraging resources in the site's locality including approximately 10.95 ha or 95.8% of the site is designated as KHA. The proposed development requires clearing and modification of 5.22 ha of habitat however, the proposed development allows for the retention of 6.02 ha of Least Concern remnant regional ecosystem vegetation that is also designated as Core Koala Habitat Area (**APPENDIX B**).

The development application was approved after a detailed consultation and assessment process having been completed by the Qld state government (SARA) and involving the Department of Environment, Science & Innovation (SARA- 2107-23765 SRA).

This approval was on the basis of the avoidance of impacts through further refinement of the development to avoid conflicts with the koala, and the preparation of Vegetation Clearing Extents Plans. A Koala Management Plan, and a revegetation management which Revegetation Plan which include but are not limited to;

- Details the retention of 6ha (~55%) of the State Government-designated KHA mapped over the site in the Conservation Area, inclusive in this is the provision of corridors.
- Provides for the active maintenance and revegetation of corridors including active and assisted regeneration and weed management,
- Requires the installation of traffic calming devices, or reduced speeds, signage and lighting at crossing areas,
- Incorporates restriction on dog ownership, with permissible dog weight will be limited to 10kg within the development to reduce the risk of dog attacks on koalas.
- All roads, gardens, walking areas will be planted with street trees that are Koala feed species occurring within the site, or adjoining the habitats (See revegetation plan). These trees must be maintained in perpetuity and replaced if any mortality occurs.
- Internal fencing must be koala friendly to reduce hazards to koala and other native fauna within the site, including minimisation of the likelihood of encounters between domestic dogs and native fauna whilst maintaining free movement through vegetation retention areas; and
- The development should minimise any additional barriers to movement and where this cannot be avoided, such as retaining walls, install appropriate mitigation devices such as a post for the Koala to climb
- Pools will be designed with shallow lagoon-style entry where the pool water is level with part of the surrounding pavement.

The conditions of consent (2107-23765 SRA) require that the development is undertaken in accordance with the;

- Vegetation Clearing Extents Plan, prepared by New Ground, dated 8 March 2022,
- Koala Management Plan, prepared by New Ground, dated 9 October 2021, and
- Conceptual Rehabilitation Plan Lot 372 SP104177, prepared by New Ground, dated 9 October 2021

In addition the conditions require that the proponent deliver an environmental offset in accordance with the Environmental Offsets Act 2014 (Qld) to counterbalance the significant residual impacts on the matter of state environmental significance being clearing of 1,729 non-juvenile koala habitat trees. The Applicant has advanced discussions to secure a physical site for environmental offsets in the Minjehla Dhagun Conservation area under the jurisdiction of the board of Yugambah Land Enterprises. The Applicant will prior to clearing works make an application (and approval) in accordance Queensland Environmental Offset Framework. The Applicant desires physical replacement works and accordingly will not be taking a financial offset route."

Regulated Vegetation

The proposed development footprint requires the clearing of approximately 5.04 ha of Category B regulated vegetation (Least Concern remnant RE 12.9-10.2). In addition, thinning of the ground and mid-layers is anticipated within about 0.72 ha of Category B regulated vegetation (Least Concern remnant RE 12.9-10.2) to provide asset protection zones to building structures (**APPENDIX B**).

Overall, the proposed development will result in a reduction in the extent of a locally well represented least concern regional ecosystem on the subject site. An environmental offset in accordance with the Queensland Environmental Offsets Policy (DES, 2020d) has been conditioned to offset any residual impacts on the koala through the planting of koala tree species at a ration of 3 to 1 for ever NJKHT removed. The proposed offset will be undertaken through direct offsetting at a legally secured offset site, providing at least 15.6ha and accordingly, will be managed to ensure that the revegetation will be rehabilitated to meet an equivalent or higher conservation status regulated ecosystem.

Chapter 6: Review of Impacts - MNES

6.1 Likelihood of Occurrence Assessment Criteria and identification of Subject Species

An assessment of the likelihood of occurrence of Ecological Communities, Threatened Species and populations has been undertaken to identify species that are likely or known to occur in the local area and the study area (**TABLE 6.1**). This assessment has been informed by desktop reviews of relevant databases, scientific literature and other studies undertaken in the region including but not limited to PMST and wildlife online searches for species that have previously been recorded or predicted to occur within a 10 km buffer of the Study Area.

The PMST results are attached as APPENDIX E The buffered area is from here on referred to as the 'locality'. The 10 km buffer was chosen as locality and adopted for the NC Act and EPBC Act assessments.

The assessment of likelihood of occurrence was then refined from the Threatened Species, Community and population lists generated from desktop review process using sites specific information and specific-species habitat information obtained from field surveys results including, vegetation community descriptions and mapping (GTRE), specific habitat attributes including micro-habitat features (such as soil cracks or caves) considered in the habitat assessments undertaken.

The assessment of the likelihood of occurrence of Ecological Communities, Threatened Species and populations assigned the following categories:

- **Known to Occur** – Recorded during the field studies or from recent studies in the local area,
- **Likely to Occur** – Known within the locality (defined as 10km) and site and study area contains appropriate habitat for the species
- **Potentially Occurring** – Known within the locality (defined as 10km) and the site and study area contains some potential habitat for the species **or** the site and study area contains appropriate potential habitat exists however the species is not known from the locality
- **Unlikely to Occur** – not known within the locality and the site and study area contains some limited habitat requirements for the species
- **Highly Likely to Occur** – confined to habitats that do not occur within 100km of the study area.

The likelihood rankings, particularly in regard to the presence of preferred habitats, are conservative and where species presence cannot be discounted, they are categorised as potentially occurring.

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TABLE 6.1: ASSESSMENT OF LIKELIHOOD OF OCCURRENCE AND IDENTIFICATION OF SUBJECT THREATENED ECOLOGICAL COMMUNITIES

ECOLOGICAL COMMUNITY NAME	STATUS (EPBC ACT)	COMMUNITY INFORMATION - HABITAT REQUIREMENTS AND OCCURRENCE	POTENTIAL FOR OCCURRENCE IN THE STUDY AREA	SUBJECT COMMUNITY IDENTIFICATION
		THREATENED ECOLOGICAL COMMUNITIES		
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community	Endangered	Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland occurs in sub-tropical, sub-humid and temperate climatic zones from Curtis Island, north of Gladstone, in Queensland to Bermagui in southern New South Wales. The canopy is dominated by *Casuarina glauca* (swamp oak, swamp she-oak), often as a relatively uniform upper layer of swamp oak. A number of Eucalyptus spp. can emerge from the canopy, with typical examples including *Eucalyptus tereticornis* (forest red gum), *E. botryoides* (bangalay), *E. grandis* (flooded gum), *E. longifolia* (woollybutt), or *E. robusta* (swamp mahogany). The ecological community is defined as patches of vegetation that meet the following key diagnostic characteristics: • Occurs from south-east Queensland to southern NSW within the South Eastern Queensland, NSW North Coast, Sydney Basin, or South East Corner bioregions • Occurs in coastal catchments at elevations up to 50 m ASL, typically less than 20 m ASL, on coastal flats, floodplains, drainage lines, lake margins, wetlands and estuarine fringes where soils are at least occasionally saturated, water-logged or inundated. There are also minor occurrences on coastal dune swales or flats, particularly deflated dunes and dune soaks. • Occurs on soils derived from unconsolidated sediments (including alluvium), typically hydrosols (grey-black clay-loam and/or sandy loam soils) and sometimes organosols (peaty soils). It may occur in transitional soils (or catenas) where shallow unconsolidated sediments border lithic substrates. • Has an open woodland, woodland, forest, or closed forest structure, with a tree canopy that has a total crown cover of at least 10 per cent. • Has a canopy of trees dominated by *Casuarina glauca* (swamp-oak, swamp she-oak). • Other characteristics that may help identify the ecological community include: • Typically occurs where groundwater is saline or brackish. • Typically occurs within 30km of the coast, but in some areas, such as along tidal river catchments, the ecological community can occur more than 100km inland. • Does not occur on rocky headlands, sea cliffs or other consolidated sediments. Department of the Environment and Energy (2018)	The site does not support the hydrological, edaphic or locational characteristics of the community, and the vegetation occurring on site are not consistent with the floristics and structure diagnostics of this ecological community.	Not considered a Subject community for the proposed activity
Grey box-grey gum wet forest of subtropical eastern Australia	Endangered	The ecological community is occurs from near Coffs Harbour in NSW to the southern areas of south-east Queensland. The ecological community typically occurs on escarpment slopes and foothills, on inland hills and ranges between 100m and 600m altitude. It is mainly associated with areas where mean annual rainfall exceeds approximately 1000mm to 1260mm. The Grey box-grey gum wet forest at maturity typically has a	The Vegetation of the site is analogous with RE 12.9-10.2 which does not meet the key diagnostic	Not considered a Subject community for the proposed activity

ECOLOGICAL COMMUNITY NAME	STATUS (EPBC ACT)	COMMUNITY INFORMATION - HABITAT REQUIREMENTS AND OCCURRENCE	POTENTIAL FOR OCCURRENCE IN THE STUDY AREA	SUBJECT COMMUNITY IDENTIFICATION
		tall to very tall open canopy dominated by its characteristic Eucalyptus species with or without hoop pine (*Araucaria cunninghamii*). It can have a simple to structurally complex understorey which typically includes flora with drier vine-forest (rainforest) affiliations, with vines often prominent. These vine-forest elements sometimes occur in combination with grassy open forest affiliated flora including juvenile eucalypts. Drier vine-forest life-forms typically present in the understorey include trees, shrubs and vines (including lianas). The Conservation Advice for the Grey box-grey gum wet forest of subtropical eastern Australia defines the ecological community as the assemblage of species that meet the following key diagnostic characteristics: • Occurs within the NSW north coast or southeast Queensland IBRA Bioregions; within the Moreton Basin, Scenic Rim, Woodenbong, Cataract, Rocky River Gorge, Washpool, Dalmorton Clarence Sandstones or Chaelundi IBRA subregions; • Occurs at elevations between 100m and 600m above sea level (ASL); • It does not occur on broader alluvial landforms (including floodplains, alluvial flats, older floodplain terraces and periodically flooded depressions), but may occur on shallower alluvial soils on the margins of the floodplain and in the smaller narrow alluvial systems. • Typically appears as a forest with a tree canopy that has a crown cover of 20% or more; • Has a tree canopy that contains *Eucalyptus mollucana* (grey box) and/or a grey gum (*E. propinqua* (small-fruited grey gum) and/or *E. punctata* (grey gum)); • Has a tree canopy dominated by one or a combination of *E. moluccana, E. propinqua*, *E. punctata, E. siderophloia* (Northern grey ironbark), or Araucaria cunninghamii (hoop pine); and • Has an understorey typically with drier vine-forest/rainforest flora (often including vines and lianas). At some locations, the understorey vine-forest floristic elements occur together with grassy open forest flora, or in a patch mosaic with areas of grassy open forest flora interspersed with or adjacent to areas of vine-forest flora. (Department of Climate Change, Energy, the Environment and Water 2022)	characteristics in the conservation advice in that; • the community overstorey varies from the TEC and • the vegetation community does not support an understorey typically with drier vine-forest/rainforest flora (often including vines and lianas).	
Lowland Rainforest of Subtropical Australia	Critically Endangered	Lowland Rainforest of Subtropical Australia ecological community primarily occurs from Maryborough in Queensland to the Clarence River (near Grafton) in New South Wales (NSW). The ecological community occurs on basalt and alluvial soils, including sand and old/elevated alluvial soils as well as floodplain alluvia. The ecological community is generally a moderately tall (≥20 m) to tall (≥30 m) closed forest (canopy cover ≥70%). Tree species with compound leaves are common and leaves are relatively large (notophyll to mesophyll). Typically there is a relatively low abundance of species from the genera Eucalyptus, Melaleuca and Casuarina. Buttresses are common as is an abundance and diversity of vines. Department of Sustainability, Environment, Water, Population and Communities 2011).	The site does not support the hydrological, edaphic or locational characteristics of the community, and the vegetation occurring on site are not consistent with the floristics and structure diagnostics of this ecological community.	Not considered a Subject community for the proposed activity

ECOLOGICAL COMMUNITY NAME	STATUS (EPBC ACT)	COMMUNITY INFORMATION - HABITAT REQUIREMENTS AND OCCURRENCE	POTENTIAL FOR OCCURRENCE IN THE STUDY AREA	SUBJECT COMMUNITY IDENTIFICATION
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland ecological community occurs on the mainland and islands near to the coast (within 20 km) within the following Bioregions: South East Queensland; NSW North Coast; Sydney Basin and the Bateman subregion of the South East Corner. Coastal Swamp Sclerophyll Forest typically features a canopy and/or sub-canopy dominated by Melaleuca spp. and/or *Eucalyptus robusta*. Other eucalypts, which are also tolerant of regular inundation and are adapted to sandy soils, may emerge from the canopy with the mix of species present varying depending on the location. (Department of Agriculture, Water and the Environment 2021).	The site does not support the hydrological, edaphic or locational characteristics of the community, and the vegetation occurring on site are not consistent with the floristics and structure diagnostics of this ecological community.	Not considered a Subject community for the proposed activity
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Poplar Box Grassy Woodland on Alluvial Plains ecological community occurs west of the Great Dividing Range, typically at less than 300 m above sea level (ASL) from Charters Towers in the north and in west of Ipswich in Queensland and Armidale in NSW, and east of Longreach in Queensland and Hillston in NSW south to Leeton in New South Wales (NSW). The 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. (Department of the Environment and Energy 2019).	The site does not support the hydrological, edaphic or locational characteristics of the community, and the vegetation occurring on site are not consistent with the floristics and structure diagnostics of this ecological community.	Not considered a Subject community for the proposed activity
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	The White Box-Yellow Box -Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community is broadly distributed in an arc along the western slopes and tablelands of the Great Dividing Range from Southern Queensland through NSW and ACT, to Victoria. The ecological community is characterised by the dominance, or prior dominance, of *Eucalyptus albens* (white box), *E. melliodora* (yellow box) and/or *E. blakelyi* (Blakely's red gum) trees. These trees may all co-occur but also exist in various combinations, including only one of these species being present at a site. The structure of the ecological community varies with location and site conditions but typically it was formerly an open grassy woodland with medium height trees. Department of Climate Change, Energy, the Environment and Water (2023).	The site does not support the hydrological, edaphic or locational characteristics of the community, and the vegetation occurring on site are not consistent with the floristics and structure diagnostics of this ecological community.	Not considered a Subject community for the proposed activity
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	The Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions occurs from Newcastle, New South Wales in the south, to just north of Gladstone in Queensland. The ecological community generally occurs on alluvial soils, with more limited occurrences on in-situ soils within localised depressions that may be at least occasionally saturated, water-logged, or inundated. The floristic composition of ecological community is primarily determined by the frequency and duration of waterlogging and the texture, nutrient and moisture content of the soil. It may be dominated by a single tree species, or by a mix of several tree species, from five genera that characterise the ecological community. These five genera are *Angophora, Corymbia, Eucalyptus, Lophostemon and Syncarpia.* The structure varies from tall open forest to woodland, although partial clearing may have reduced the canopy to scattered trees in some areas. Elsewhere, there may be localised areas of denser closed forest and/or low forest (Department of Climate Change, Energy, the Environment and Water 2022).	The site does not support the hydrological, edaphic or locational characteristics of the community, and the vegetation occurring on site are not consistent with the floristics and structure diagnostics of this ecological community.	Not considered a Subject community for the proposed activity

TABLE 6.2: ASSESSMENT OF LIKELIHOOD OF OCCURRENCE AND IDENTIFICATION OF SUBJECT THREATENED ECOLOGICAL COMMUNITIES

SCIENTIFIC AND COMMON NAME	STATUS (EPBC ACT)	SPECIES INFORMATION - HABITAT REQUIREMENTS AND OCCURRENCE	POTENTIAL FOR OCCURRENCE IN THE STUDY AREA	SUBJECT SPECIES IDENTIFICATION
		AVIFAUNA		
Anthochaera phrygia Regent Honeyeater	Critically Endangered	The Regent Honeyeater is predominantly found along the inland slopes of the Great Dividing Range, however it is often recorded along the eastern flank of this range. (Commonwealth of Australia 2016) The Regent Honeyeater generally inhabits drier temperate woodlands and open forests with an abundance of nectar producing Eucalypts including Box-Ironbark woodland in the west and Eucalyptus robusta/Melaleuca quinquenervia forests on the coast. While nectar represents a major food source, insects, manna, lerps and fruit also comprise the diet of this species Commonwealth of Australia (2016) The Regent Honeyeater is partly migratory travelling to the south and west during spring to breed. Nests are cup-shaped and located in the fork of a tree or clump of mistletoe between one and twenty metres above the ground Commonwealth of Australia (2016)	The vegetation and habitat within the site is considered unsuitable for this species. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Ardenna grisea Sooty Shearwater	Vulnerable	The Sooty Shearwater is a pelagic species that forages in cold water zones with upwellings, especially around the subtropical, and southern ocean. The species' diet consists of a wide range of pelagic prey, consisting mainly of cephalopods, fish, and crustaceans (particularly krill and amphipods (Marchant & Higgins 1990). Birds dive into the water for prey, routinely reaching 50 – 60 m in depth, and up to around 90 m The Sooty shearwater breeds on offshore islands off New South Wales and Tasmania	The site provides no appropriate oceanic habitat for foraging and no breeding habitats critical for the species. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Botaurus poiciloptilus Australasian Bittern	Endangered	The Australasian bittern prefers freshwater wetlands with tall, dense vegetation, dominated by sedges, rushes and/or reeds (Marchant and Higgins, 1990). In Queensland this species is restricted to the far south-east, but has only been occasionally recorded in the region (DoE, 2016).	The site does not contain any freshwater wetlands critical for the species foraging or breeding. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Calidris acuminata Sharp-tailed Sandpiper	Vulnerable	In Queensland, the species is widespread along the coast and is sparsely scattered inland, particularly in central and south-western regions (Higgins & Davies 1996). The Sharp-tailed Sandpiper feeds along the edge of water on mudflats, coastal and inland wetlands, and sewage ponds. Sharp-tailed sandpipers are omnivorous. Their diet comprises mostly of seeds, worms, molluscs, crustaceans, and insects, Roosting habitat on migration, the species forages and roosts on rocky and sandy beaches, freshwater habitats, and inland saltwater habitats (Higgins & Davies 1996)	The site does not contain any estuarine or wetland habitats appropriate for foraging or roosting. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Calidris canutus Red Knot, Knot	Vulnerable	Migratory species the species mainly inhabits intertidal mudflats, sandflats, and sandy beaches of sheltered coasts, estuaries, bays, inlets, lagoons, and harbours. They are occasionally seen on terrestrial saline wetlands near the coast and have been recorded	The site does not contain any estuarine or wetland habitats appropriate for foraging or roosting.	Not considered a Subject species for the proposed activity

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		on sewage ponds and saltworks. Red knots are both diurnal and nocturnal. In non-breeding areas, the bird's feeding activity is regulated by the tide, with individuals following the receding edge of the tide to feed. Whilst in its non-breeding range, the bird's diet consists of intertidal invertebrates such as bivalve and gastropod molluscs, crustaceans' annelid worms, and insects (del Hoyo et al. 1996; Karpanty et al. 2006).	Highly unlikely to occur	
Calidris ferruginea Curlew Sandpiper	Critically Endangered	Curlew sandpipers are a seasonal migrant to Australia breeding in Siberia. In Australia, 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. Occasionally they are recorded around floodwaters (Higgins & Davies, 1996).	The site does not contain any estuarine or wetland habitats appropriate for foraging or roosting. Highly unlikely to occur	Not considered a Subject species for the proposed activity
Calyptorhynchus lathami lathami Glossy Black-Cockatoo (South-eastern)	Vulnerable	The Glossy Black-Cockatoo primarily feeds upon the fruit cones of Allocasuarina species and are more often found in moist and dry coastal forests timbered watercourses and inland woodland (Schodde and Tidemann, 1993; NPWS, 2000). They are distributed along the east coast of Australia from central Queensland, south to Victoria. A separate population occurs on Kangaroo Island, SA (Schodde and Tidemann, 1993; NPWS, 2000). The Glossy Black-Cockatoo requires hollow bearing trees located within close proximity to good stands of feeding habitat for nesting (NPWS, 2000). Characteristically inhabits eucalypt open forest and woodland with hollow-bearing trees and a mid-storey dominated by *Allocasuarina* (she-oak) species (NSW Scientific Committee, 2008; Birdlife Australia, 2012). The distribution of such habitat is also associated with the presence of low-nutrient soils. Prefers drier forest types with intact and less rugged landscapes. Often restricted to remnant *Allocasuarina* patches surrounded by cleared farmlands (Birdlife Australia, 2012). Forages exclusively on seeds of she-oaks. Key food species on the coast and tablelands include: *Allocasuarina torulosa* and *A. littoralis*, with some *A. distyla.* Key food species inland include: Casua*rina cristata, A. verticillata, A. inophloia, A. diminuta, A. gymnanthera*, and *A. leuhmannii*.	The site provides only small, scattered stands of young *Allocasuarina littoralis* which are situated in the conservation area and outside the proposed development footprint. Not recorded during the surveys and no evidence of orts were observed. The site provides negligible habitat resources. Hollow bearing trees with cavities of sufficient size to provide potential nesting resources for this species were sparse and are not found in close proximity to potential feeding areas. The species may utilise the site in future for foraging as Allocasuarina trees mature and provide feeding resources. Considered as potentially occurring.	Not considered a Subject species for the proposed activity
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover	Vulnerable	Breeds in central Asia and migrates further south for winter. In Australia, this species more commonly occurs on the west coast and is noted as being rare on the east coast where it has been recorded between the northern Rivers and Illawarra. Most records on the east coast are from the Clarence and Richmond estuaries (DECC, 2007). This species is almost entirely restricted o coastal areas where it mainly occurs on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats	The site does not contain any estuarine or wetland habitats appropriate for foraging or roosting. Highly unlikely to occur	Not considered a Subject species for the proposed activity

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		and/or sandbanks. Feeds on includes insects, crustaceans, polychaete worms and molluscs (DECC, 2007).		
Climacteris picumnus victoriae Brown Treecreeper (south-eastern)	Vulnerable	Brown treecreepers (south-eastern) are endemic to south-eastern Australia from the Grampians in western Victoria, through central New South Wales to the Bunya Mountains in Queensland (Schodde & Mason 1999), The Conservation advice for the species defines Habitat critical to the survival of the brown treecreeper as areas that have: • Relatively undisturbed grassy woodland with native understorey and a habitat structure which is quite open at ground level so that birds are able to feed on or near the ground and maintain vigilance against predators. • large living and dead trees which are essential for roosting and nesting sites and for foraging; • fallen timber which provides essential foraging habitat and; • hollows in standing dead or live trees and tree stumps are also essential for nesting.	Not recorded during the surveys. As the site supports regrowth vegetation and due to the small area of the site, it is unlikely to be used by the Brown treecreeper. Considered as unlikely to occur.	Not considered a Subject species for the proposed activity
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot	Endangered	The Coxen's Fig-Parrot primary habitat is lowland subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, sub-littoral mixed scrub, riparian corridors in woodland, open woodland and across cleared land, and urbanised and agricultural areas with fig trees (Coxen's Fig-Parrot Recovery Team 2001).	The site provides no appropriate rainforest habitat for the species. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Diomedea antipodensis Antipodean Albatross	Vulnerable	The Antipodean Albatross is endemic to New Zealand. Despite this, outside its breeding season, this species forages extensively over the southwest Pacific Ocean, Tasman Sea, and the Southern Ocean, particularly off the NSW coast (Elliott and Walker, 2005; Environment Australia, 2001; Garnett and Crowley, 2000, as cited in DoE 2016). This species is an aerial, pelagic, and marine bird, where it rests and sleeps on ocean waters outside of the breeding season.	No appropriate habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Diomedea antipodensis gibsoni Gibson's Albatross	Vulnerable	Gibson's albatross breeds only in the subantarctic Auckland Islands archipelago of New Zealand. Breeding females feed mainly in the Tasman Sea, while the males forage further south in the sub Australian or mid Pacific sectors of the Southern Ocean between latitudes of 30° and 50° S, especially the "Roaring Forties" where the weather systems assist their foraging. Though they may sometimes travel as far south as the edge of the Antarctic pack-ice in late summer, they are rarely seen south of the Antarctic Convergence in winter.	No appropriate oceanic habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Diomedea exulans (sensu lato) Wandering Albatross	Vulnerable	The Wandering Albatross nests on Macquarie Island and is highly dispersive in all the southern oceans from the edge of the pack ice (68˚S), north to at least the Tropic of Capricorn and sometimes beyond (Commonwealth of Australia 2021b).	No appropriate oceanic habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity

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Erythrotriorchis radiatus Red Goshawk	Endangered	Red goshawks are currently known to breed from the Kimberley, east to Cape York Peninsula, and on the Tiwi Islands (MacColl et al. 2021). They may still breed at very low densities in the Wet Tropics and Einasleigh Uplands though record data are scarce Occurs in coastal and sub-coastal areas in wooded and forested lands of tropical and warm-temperate Australia including: eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest, and rainforest fringes (DCCEEW, 2023). A preference is given to such habitats that afford a mosaic of vegetation types, large prey populations (birds), and permanent water (DoE, 2016). They are frequently seen in riparian habitats along or near watercourses or wetlands (OEH, 2014). Forests of intermediate density are favoured for hunting, or ecotones between habitats of differing densities. Sometimes utilise mangroves, open river floodplains, low open woodland, agricultural land and pasture (DoE, 2016). They tend to avoid dense and very open habitats.	No appropriate habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Falco hypoleucos Grey Falcon	Vulnerable	One of Australia's rarest birds. The species occurs in arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia (Marchant and Higgins 1993). The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times (Schoenjahn 2018). The species appears to be absent from Cape York Peninsula, areas east of the Great Dividing Range in Queensland and New South Wales, south of the Great Dividing Range in Victoria, Occurs throughout the arid and semi-arid zones of Australia. Typically restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions. Sometimes found in open woodlands near the coast. Will frequent wetlands where surface waters attract prey. Usually nests in tall living Eucalypts in close proximity to water or a watercourse (	The site edaphic characteristics, location and vegetation community is not typical of the species habitats. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Gallinago hardwickii Latham's Snipe, Japanese Snipe	Vulnerable	Latham's snipe is a non-breeding visitor to south-eastern Australia and is a passage migrant through northern Australia. The range extends inland over the eastern tablelands in south-eastern Queensland, and occasionally from Rockhampton in the north, and west of the Great Dividing Range in New South Wale, is widespread in Tasmania and is found in all regions of Victoria except for the north-west. Latham's snipe feed in soft mudflats or shallow water typically at night, early morning, or evening, They shelter during the day in small wetlands including urban water bodies, saltmarshes, as well as creek edges, where there is adequate shallow flooded or	The site does not contain any estuarine or freshwater wetlands suitable for the species Highly unlikely to occur. .	Not considered a Subject species for the proposed activity

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		inundated substrate (Department of Climate Change, Energy, the Environment and Water 2024).		
Geophaps scripta scripta Squatter Pigeon (Southern)	Vulnerable	The squatter pigeon (southern) occurs on the inland slopes of the Great Dividing Range. Its current distribution extends from the Burdekin-Lynd Divide in central Queensland, west to Longreach and Charleville, east to the coast between Port Curtis and Proserpine, and south to New South Wales. It inhabits grassy woodlands and open forests dominated by eucalypts and appear to prefer sandy areas and habitats close to bodies of water. Also known to frequent sown grasslands with scattered remnant trees, disturbed habitats (along roads and railways, around settlements etc.), and in scrub and acacia growth (DoE, 2016).	The location of the Study area is in the southern extent of its extant range where, the species is largely restricted to the west of the Great Dividing Range. The vegetation community on the site is generally not consistent with the grassy woodlands which this prefers. Highly unlikely to occur	Not considered a Subject species for the proposed activity
Grantiella picta Painted Honeyeater	Vulnerable	The Painted Honeyeater is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory, on inland slopes of the Great Dividing Range between the Grampians, Victoria and Roma, Queensland Nomadic species found in dry open forests and woodlands, in particular Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. (OEH, 2012; BLA, 2012). May also be seen along waterways, on plains with scattered trees and on farmland in remnant vegetation. Sometimes seen in urban parks and gardens where large eucalypts are present (BLA, 2012). Specialises in foraging at the flowers of mistletoes that grow on woodland eucalypts and acacias, and shows a preference for mistletoes of the genus *Amyema* (Department of the Environment 2015).	The species generally confined to the inland slopes of the Great Dividing Range. Highly unlikely to occur	Not considered a Subject species for the proposed activity
Hirundapus caudacutus White-Throated Needletail	Vulnerable	The White-throated Needletail is widespread in eastern and south-eastern Australia. The species is mostly aerial and therefore not tied to any specific habitat. Most often spotted above wooded areas such as open forest and rainforest. Frequently seen flying over heathland, farmland or mudflats. In coastal areas they sometimes forage in areas with prominent updraught, including around coastal cliffs, ridges and sand dunes (DSEWPaC, 2012). Will roost in trees in forests and woodlands in hollows or amongst dense foliage in the canopy. Known to breed in wooded lowlands, sparsely vegetated hills, and mountains covered with coniferous forests (DSEWPaC, 2012, Threatened Species Scientific Committee 2019).	The species may forage over the subject site however the site is unlikely to be utilised for roosting by the species. Unlikely to occur	Not considered a Subject species for the proposed activity
Lathamus discolor Swift Parrot	Critically Endangered	The Swift Parrot breeds in Tasmania between spring and summer and migrate to the mainland during winter where they disperse widely across south eastern Australia (NPWS, 2000; Scodde & Tidemann, 1993). Swift Parrots nest in tree hollows from a variety of Eucalypt species, and usually in old growth trees with a DBH of over 0.8 m.	The site edaphic characteristics, location and vegetation community is not typical of the species habitats.	Not considered a Subject species for the proposed activity

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		Swift Parrots forage in woodlands, riparian vegetation, and also remnant patches of mature eucalypts in agricultural areas where they feed on nectar, lerps and other insects from eucalypt foliage (NPWS, 2000; Swift Parrot Recovery Team, 2001, Schodde and Tidemann, 1993). Commonly inhabits dry sclerophyll eucalypt and box-ironbark forests and woodlands. Occasionally found in wet sclerophyll forests. In northern NSW and south-eastern QLD Narrow-leaved Red Ironbark (*E. crebra*), Forest Red Gum forests and Yellow Box forest are favoured. Found in areas with winter flowering tree species such as swamp Mahogany (*E. robusta*), Spotted Gum (*Corymbia maculata)*, Red Bloodwood (*C. gummifera*), Mugga Ironbark (*E. sideroxylon*), and White Box (*E. albens*) (OEH, 2014). Also feeds on commonly lerp infested trees such as Inland Grey Box (E. microcarpa), Grey Box (*E. moluccana*) and Blackbutt (*E. pilularis*) (Threatened Species Scientific Committee 2016).	Highly unlikely to occur.	
Macronectes giganteus Southern Giant-Petrel	Endangered	The Southern Giant-Petrel (*Macronectes giganteus)* is marine species that shows a circumpolar pelagic range from Antarctica to approximately 20°S and is a common visitor off the coast of NSW (OEH, 2014). Found over open seas and inshore waters. An opportunistic scavenger and predator both on and offshore. Favour edges of continental shelf, are abundant over pack-ice near penguin and seal colonies, and will scavenge from fishing vessels or land at sewage outfalls (DoE 2016; OEH, 2014).	No appropriate oceanic habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Macronectes halli Northern Giant Petrel	Vulnerable	A marine and oceanic species. In winter and early spring, their range extends into subtropical waters (to 28°S), and they are common along coasts and offshore waters of southern Australia between May and October (DoE 2016; OEH, 2014). Frequent inshore and pelagic seas out from edges of continental shelves, slopes and cold eastern boundary currents off South America, South Africa, Australia and New Zealand (DoE 2016). They are known to scavenge at colonies of penguins and seals, and are attracted to land at sewage outfalls (DoE 2016).	No appropriate oceanic habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Neophema chrysostoma Blue-winged Parrot	Vulnerable	Blue-winged parrots breed on mainland Australia south of the Great Dividing Range in southern Victoria, South Australia, and Tasmania. During the non-breeding period, from autumn to early spring, birds are recorded from northern Victoria, eastern South Australia, south-western Queensland and western New South Wales (Higgins 1999). Blue-winged parrots inhabit a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. They tend to favour grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones (Department of Climate Change, Energy, the Environment and Water 2023).	The study area does not contain preferred habitat for the species. Highly unlikely to occur.	Not considered a Subject species for the proposed activity

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Ninox strenua Powerful Owl	NC Vulnerable	The Powerful Owl is endemic to eastern and south-eastern Australia. In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered, mostly historical records on the western slopes and plains (OEH, 2012). Now uncommon throughout its range where it occurs at low densities. Inhabits a range of vegetation types. Prefers tall wet sclerophyll forests with densely vegetated rainforest gullies (BCC, 2005). Will inhabit marginally lower or drier forests that contain prey and large hollows (BCC, 2005). Requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well (OEH, 2012). The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine Syncarpia glomulifera, Black She-oak *Allocasuarina littoralis*, Blackwood Acacia melanoxylon, Rough-barked Apple Angophora floribunda, Cherry Ballart Exocarpus cupressiformis and a number of eucalypt species (OEH, 2012).	The species is unlikely to utilise the habitats of the subject site despite some prey species occurring, and no hollows of sufficient size occur for breeding. Unlikely to occur.	Not considered a Subject species for the proposed activity
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew	Critically Endangered	Far eastern curlews are endemic to the East Asian – Australasian Flyway. During the austral summer non-breeding season, most (estimated at 73 percent) of the species' population occurs in Australia (Bamford et al. 2008; Hansen et al. 2016). Within Australia, far eastern curlews have a mostly coastal distribution; they are rarely recorded inland. The Far Eastern Curlew mainly forages around sheltered intertidal sandflats or mudflats that are open and without vegetation or seagrass. The species often also forages near mangroves, on saltflats or saltmarsh, around rockpools, amongst rubble on coral reefs, and on ocean beaches near the tideline (Department of Climate Change, Energy, the Environment and Water (2023).	The site does not contain any estuarine or freshwater wetlands suitable for the species Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Pachypyila turtur subantarctica Fairy Prion (Southern)	Vulnerable	The fairy prion (southern) breeds on Macquarie Island and a number of other subantarctic islands outside of Australia. There are 80 to 250 breeding pairs in Australia and a global population of 80 000. In Australia, breeding is recorded on two rock stacks off Macquarie Island and on the nearby Bishop and Clerk Island. The population may have been larger prior to the arrival of black rats on Macquarie Island. The subspecies digs burrows among rocks or low vegetation in which to nest. Burrows may be dug below mat forming herbs. Feeds by plucking food from the ocean surface. Some individuals may migrate towards New Zealand and southern Australia in winter (Threatened Species Scientific Committee (2015)	No appropriate oceanic habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Rostratula australis Australian Painted Snipe	Endangered	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans (DoE, 2016). They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains (DoE, 2016). Typical sites	The site does not contain any estuarine or freshwater wetlands suitable for the species Highly unlikely to occur.	Not considered a Subject species for the proposed activity

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		include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum Muehlenbeckia or canegrass or sometimes tea-tree (Melaleuca) (DoE, 2016).		
Stagonopleura guttata Diamond Firetail	Vulnerable	Diamond firetails occur on the south-east mainland of Australia from south-east Queensland to Eyre Peninsula, South Australia, and about 300 km inland from the sea. The Diamond Firetail occupies Eucalypt woodlands and forests, acacia or casuarina woodlands and mallee that are lightly timbered and where there is a grassy understorey. Diamond Firetails build bottle-shaped nests in trees and bushes, and forage on the ground for grass seeds and other plant material and insects (Blakers et al., 1984, Read, 1994, Department of Climate Change, Energy, the Environment and Water 2023). .	The vegetation community occurring in the study does not support appropriate habitat for the species. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Sternula nereis nereis Australian Fairy Tern	Vulnerable	Nests on sheltered sandy coastal beaches, inlets, spits and banks above the tide line and below vegetation (DSEWPaC, 2013; Birdlife Australia, 2013). Inhabits the embayments of various habitats including offshore, estuarine or lacustrine (lake) islands, fresh and saline wetlands, near-coastal terrestrial wetlands, and mainland coastline (DSEWPaC, 2013; Birdlife Australia, 2013).	The site does not contain breeding habitat or oceanic habitats for this species Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Thalassarche cauta Shy Albatross	Endangered	The Shy Albatross has a circumpolar distribution, and occurs throughout the southern oceans. This species breeds on offshore islands of Australia and New Zealand. This is the only Albatross to breed in Australia, on Albatross Island, Bass Strait; and the Mewstone and Pedra Branca, in southern Tasmania (DoE 2016). This species occurs along coastal Australian waters, from Carnarvon, Western Australia, to Stradbroke Island, Queensland. Despite this, records are uncommon north of Sydney, NSW. Rare visits to south east Queensland do occur in winter and spring (DoE 2016). This species shows habitat preference for subtropical and subantarctic marine waters. Sometimes this species is recorded in continental shelf waters, harbours, and bays (OEH, 2014; Commonwealth of Australia 2021b).	No appropriate oceanic habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Thalassarche impavida Campbell Albatross	Vulnerable	The Campbell Albatross is a marine sea bird inhabiting sub-Antarctic and subtropical waters from pelagic to shelf-break water habitats (DoE 2016). They tolerate sea surface-temperatures from 0–24 °C but are mainly found in the sub-Antarctic (DoE 2016). In breeding and non-breeding seasons, the Campbell Albatross are specialised shelf feeders, concentrating around breeding islands or over adjacent submarine banks (DoE 2016). In winter, they are commonly found in the coastal waters of continents, over up-wellings or boundaries of currents (Commonwealth of Australia 2021b).	No appropriate oceanic habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Thalassarche melanophris Black-Browed Albatross	Vulnerable	The Black-browed Albatross has a circumpolar distribution and can be found in subtropical, subantarctic, Antarctic, and coastal seas over boundaries and upwellings of currents (DoE 2016; OEH, 2014). This species breeds on several sub-Antarctic islands	No appropriate oceanic habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity

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		including Heard Island and Macquarie Island. This species regularly visits during winter-spring as a migrant to Cape Geraldton, WA and as far north as the Tropic of Capricorn in Queensland (DoE 2016). This species typically is recorded over shelf breaks, however it is also common over shelfs, such as, Bass Strait and inshore areas (Commonwealth of Australia 2021b).		
Thalassarche salvini Salvin's albatross	Vulnerable	Salvin's Albatross is a marine species occurring in subantarctic and subtropical waters, reaching the tropics in the cool Humboldt Current, off South America (DoE 2016). During the non-breeding season, the species occurs over continental shelves around continents. It occurs both inshore and offshore and enters harbours and bays (DoE 2016). Salvin's Albatross is scarce in pelagic waters (Commonwealth of Australia 2021b).	No appropriate oceanic habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Thalassarche steadi White-Capped Albatross	Vulnerable	The White-capped Albatross is allegedly common off Australia's south-east coast. This species breeds on the Auckland Island Group (New Zealand), however it disperses widely outside of breeding season. This species shows preference for subtropical and subantarctic waters (DoE 2016). Most records of this species have occurred in shelf-waters around breeding islands. During the non-breeding season, this species has been recorded over continental shelves, offshore, and inshore including bays and harbours (DoE 2016). However, this species is uncommonly recorded in pelagic waters (Commonwealth of Australia 2021b).	No appropriate oceanic habitat occurs within or near the subject site. Highly unlikely to occur.	Not considered a Subject species for the proposed activity
Turnix melanogaster Black-Breasted Button-Quail	Vulnerable	The Black-breasted Button-quail is endemic to south-eastern Queensland and far north-eastern NSW, at scattered sites from the Byfield region south to the Border Ranges and mainly on and east of the Great Divide but extending inland to the inner western slopes, up to 300 km from the coast. Preferred habitat is drier low closed forests, including dry rainforests, vine forest and vine thickets, often in association with Hoop Pine, and Bottletree scrubs (DoE, 2016). The understorey may be dense or sparse, but a deep, moist leaf-litter layer, in which the birds forage, is an important component of habitat. Birds have been recorded using Lantana thickets at edges of rainforest or Lantana understorey of forest or rainforest, but it is not known if Lantana associations are suitable for sustaining breeding (Commonwealth of Australia 2021)	The site lacks vegetation types such as rainforests and vine thickets or any thick low native shrub layer and therefore the site is unlikely to support habitat for this species. Not recorded during the survey – Unlikely to occur	Not considered a Subject species for the proposed activity
		FISH		
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse	Endangered	White's Seahorse is considered to be endemic to the waters of southern Queensland (Hervey Bay) to South Coast NSW where it can be found occurring in coastal embayments and estuaries. It is known to occur from depths of 1 m to 18 m. Habitats that are considered important habitat for the White's Seahorse include natural habitats such as sponge gardens, seagrass meadows and soft corals. It is also known to use	The site does not contain nor is directly connected to estuarine coastal waters. Considered Highly Unlikely to occur	Not considered a Subject species for the proposed activity

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		artificial habitats such as protective swimming net enclosures and jetty pylons (NSW DPI 2024)		
Maccullochella mariensis Mary River Cod	Endangered	The Mary River cod occurs in southeast Queensland in the Mary River system. Historically the Mary River cod was more wide spread occurring across the Brisbane-Stanley, Albert-Logan and Coomera River systems The Mary River cod inhabits from high gradient, rocky, upland streams, to large, slow-flowing pools in lowland areas. Anecdotal accounts by anglers and landowners often describe the ideal cod habitat as comprising deep, shaded, slow flowing pools with plenty of snags and log-piles.	The site does not contain nor is directly connected to significant freshwater streams or rivers. . Considered Highly Unlikely to occur	Not considered a Subject species for the proposed activity
Epinephelus daemelii Black Rockcod	Vulnerable	The distribution of black cod ranges from southern Queensland through NSW to northern Victoria. However, records from Queensland and Victoria are rare Black cod generally inhabit near-shore rocky and offshore coral reefs at depths down to 50 m. In coastal waters adult black cod are found in rock caves, rock gutters and on rock reefs.	The site does not contain nor is directly connected to estuarine coastal waters. Considered Highly Unlikely to occur	Not considered a Subject species for the proposed activity
Neoceratodus forsteri Queensland Lungfish	Vulnerable	The Australian Lungfish is endemic to Australia and restricted to south-eastern Queensland. The species' natural distribution is the Mary, Burnett and Brisbane River systems and (possibly) the Pine River system (Kemp 2014). The species has been translocated to many other locations and translocated populations persist in the Coomera, Condamine, Albert and Logan Rivers (Kemp 2014). The Lungfish occurs in a number of water body types, ranging from relatively undisturbed streams to highly altered environments, such as Lake Samsonvale and Lake Wivenhoe (Brooks & Kind 2002; Johnson 2001; Kemp 2014). However, heavily altered water bodies are unlikely to be suitable for the species in the long-term, evidenced by the local extinction of the species from the Enoggera Reservior, following translocation to the area (Kemp 2014). The Australian Lungfish requires still or slow-flowing, shallow, vegetated pools with clear or turbid water in which to spawn and feed (Allen 1989a; Merrick & Schmida 1984). The species is restricted to areas of permanent water (Brooks & Kind 2002) and cannot live in saline waters or migrate through sea water (Arthington 2009). Emergent or submerged vegetation are essential for successful deposition of eggs and for providing refuges for juveniles (Kemp 2014). Department of the Environment (2024). *Neoceratodus forsteri* in Species Profile and Threats Database, Department of the Environment, Canberra.	The site does not contain nor is directly connected to significant freshwater streams or rivers. . Considered Highly Unlikely to occur	Not considered a Subject species for the proposed activity

FROGS

SCIENTIFIC AND COMMON NAME	STATUS (EPBC ACT)	SPECIES INFORMATION - HABITAT REQUIREMENTS AND OCCURRENCE	POTENTIAL FOR OCCURRENCE IN THE STUDY AREA	SUBJECT SPECIES IDENTIFICATION
Assa darlingtoni Pouched Frog	Vulnerable	The pouched frog occurs in the coastal Conondale, Blackall and D'Aguilar Ranges in south eastern Queensland (Qld) and on the eastern escarpments and uplands of the Great Dividing Range in south-eastern Qld and north-eastern New South Wales (NSW) (Mahony et al. 2021; Cutajar et al. 2022), largely within protected areas (Keith et al. 2014; CAPAD 2020). The species is restricted to upland habitats in six disjunct regions (from north to south): The pouched frog is restricted to refugial closed forest communities (> 90% canopy cover), at elevations largely above 800 m. The species is mainly found in temperate and sub-tropical rainforests but has also been recorded in wet sclerophyll forests	The habitats of the study area do not support any wet sclerophyll or rainforest associations, and the species was not detected during the targeted frog surveys conducted within the study area. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity
Mixophyes fleayi Fleay's Frog	Endangered	Fleay's Barred Frog is narrowly distributed in wet forests from the Conondale Range in south-east Queensland, south to Yabbra Scrub in north-east New South Wales. This species occurs in Rainforest and wet eucalypt forest of the escarpment and foothills, usually close to gravely streams at higher altitudes (above 400 m) but has been found at elevations ranging from 100–1000 m. The species occurs along stream habitats from first to third order streams and is not found in ponds or ephemeral pools). Adults may be found in leaf litter and along watercourses in rainforest and adjoining wet sclerophyll forests.	The habitats of the study area do not support any wet sclerophyll or rainforest associations, and the species was not detected during the targeted frog surveys conducted within the study area. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity
		INVERTEBRATES		
Argynnis hyperbius inconstans Australian Fritillary	Critically Endangered	The Australian fritillary has been recorded in scattered locations across south-eastern Queensland and north-eastern New South Wales The subspecies has been recorded as far north as Mt Bellenden Ker in Queensland, and as far south as the Hunter Valley in NSW. The Australian Fritillary inhabits river estuaries and open swampy coastal habitat at or near sea level (OEH, 2012; DEHP, 2012). Often found in Melaleuca wetlands. Restricted to where the larval food plant, Native Violet (*Viola betonicifolia*), grows in ground level vegetation in swampy areas beneath Long Leaved Matrush (*Lomandra longifolia*) and grasses, especially *Imperata cylindrica* (bladey grass) (Threatened Species Scientific Committee 2017)	The study area does not occur near estuarine habitats and contains no wetland habitats. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity
		MAMMALS		
Chalinolobus dwyeri Large-Eared Pied Bat	Endangered	The Large-eared Pied Bat has been found in scattered locations from near Rockhampton in Queensland to Ulladulla in southern NSW. This species is known to use a range of habitat types, including riparian corridors, sclerophyll forest and Brigalow. It is generally found in drier habitats such as dry sclerophyll forests and woodlands however recent records from sub alpine woodland and Rainforest edges. The Large-eared Pied bat is known to utilise day time roosts including caves mine tunnels and	The site provides marginal potential habitat for foraging generally outside its known range of occurrence and provides no caves. Highly Unlikely to occur	Not considered a Subject species for the proposed activity

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		abandoned mud nests of Fairy Martins (Department of Climate Change, Energy, the Environment and Water 2023).		
Dasyurus hallucatus Northern Quoll	Endangered	The Northern Quoll was historically common across northern Australia, occurring almost continuously from the Pilbara, Western Australia, to near Brisbane, Queensland. The Northern Quoll now occurs in five regional populations across Queensland, the Northern Territory and Western Australia both on the mainland and on offshore islands. 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 (Threatened Species Scientific Committee 2005). Northern Quoll are also known to occupy non rocky lowland habitats such as beachscrub communities in central Queensland. Northern Quoll habitat generally encompasses some form of rocky area for denning purposes with surrounding vegetated habitats used for foraging and dispersal. Rocky habitats are usually of high relief, often rugged and dissected but can also include tor fields or caves in low lying areas such as in Western Australia. 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 (Threatened Species Scientific Committee 2005). Northern Quolls sometimes occur around human dwellings and campgrounds. Northern Quolls appear to be most abundant in habitats within 150 km of the coast (Threatened Species Scientific Committee 2005).	The Northern Quoll has not been recorded this near Brisbane recently and the habitats are marginal for foraging and lack appropriate denning habitat. Considered Highly Unlikely to occur.	Not considered a Subject species for the proposed activity
Dasyurus maculatus maculatus Spotted-tail Quoll (southeastern mainland population)	Endangered	The Spotted-tailed Quoll (south-eastern mainland population) (*Dasyurus maculatus maculatus*) occurs from southern Queensland through to south-western Victoria and Tasmania. This subspecies has been recorded in a wide range of habitat types including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline (DEHP, 2013). This species been occasionally sighted in treeless areas, rocky outcrops and grazing lands (DEHP, 2013). Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves (NPWS 1999at). Individuals also require an abundance of food, such as birds and small mammals, and large areas of relatively intact vegetation through which to forage (Threatened Species Scientific Committee 2020).	The study area provides limited habitat for the Spotted-tailed Quoll (south-eastern mainland population) has not been recorded this near Brisbane recently and the habitats are marginal for foraging and lack appropriate denning habitat. Considered Unlikely to occur.	Not considered a Subject species for the proposed activity
Macroderma gigas Ghost Bat	Vulnerable	The Ghost Bats' current range is discontinuous, with geographically disjunct colonies occurring in the Pilbara, Kimberley Northern Territory (including Groote Eylandt), the Gulf of Carpentaria (Australian Wildlife Conservancy 2010), coastal and near coastal eastern Queensland from Cape York to near Rockhampton, and western Queensland (including Riversleigh and Camooweal districts. They currently occupy habitats ranging	The study area is not considered to be within the species current occurrence range and the site contains no roosting or breeding habitats. Considered Highly Unlikely to occur.	Not considered a Subject species for the proposed activity

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		from the arid Pilbara to tropical savanna woodlands and rainforests. Roost sites include caves, rock crevices and disused mine adits and they move between a number of caves seasonally or as dictated by weather conditions. (Threatened Species Scientific Committee 201).		
Petaurus australis australis Yellow-bellied Glider (south-eastern)	*Vulnerable*	The Yellow-Bellied Glider (south-eastern) is found at altitudes ranging from sea level to 1400 m above sea level from south-eastern Queensland to far south-eastern SA. In Qld the distribution is coastal, extending southward along the eastern seaboard from north of Mackay and continuing through the NSW-Qld border. The subspecies habitat is eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests and shows a preference for large patches of mature old growth forest that provide suitable trees for foraging and shelter. Habitat critical to the survival is defined as areas containing the following attributes; • large contiguous areas of floristically diverse eucalypt forest, which are dominated by winter-flowering and smooth-barked eucalypts, including mature living hollow-bearing trees and sap trees; • areas identified as refuges under future climate change scenarios; • short or long-term post-fire refuges (i.e., unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas; • habitat corridors required to facilitate dispersal of the subspecies between fragmented habitat patches and/or that enable recolonization or movement away from threats. yellow-bellied gliders (south-eastern) have a glide ratio (horizontal distance/height dropped) of around 2.0, and corridors spanning gaps larger than the distance gliders are likely to be able to travel should be considered critical to the survival. • areas in which some trees have evidence of use for sap extraction by yellow-bellied glider (south-eastern). (Department of Agriculture, Water and the Environment (2022).	The site provides some potential habitat trees however the age classes of eucalypts are not old growth habitats that the species prefers. Further, the separation distances (distances from other contiguous habitats) are generally larger than the Glide distances where this species is found. Considered Highly Unlikely to occur.	Not considered a Subject species for the proposed activity
Petauroides volans Greater Glider (southern and central)	Endangered	The greater glider (southern and central) occurs in eastern Australia, where it has a broad distribution from around Proserpine in Qld, south through NSW and the ACT, to Wombat State Forest in central Vic. Recent records of this species in the region are from Redland Bay, Alexandra Hills and Sheldon The subspecies occurs in eucalypt forests and woodlands where they feed exclusively on eucalypt leaves, buds, flowers and mistletoe. The greater glider will shelter during the day in tree hollows and will use up to 18 hollows in their home range. Habitat critical to survival for the greater glider (southern and central) may be broadly defined as:	The site contains suitable feed trees however the age classes of eucalypts are relatively young with only scattered mature trees and therefore the site has a low density of medium sized hollows. Further, the separation distances (distances from other contiguous habitats) are generally larger than the Glide distances where this species is found.	Not considered a Subject species for the proposed activity

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		• large contiguous areas of eucalypt forest, which contain mature hollow-bearing trees1 and a diverse range of the species' preferred food species in a particular region; and • smaller or fragmented habitat patches connected to larger patches of habitat, that can facilitate dispersal of the species and/or that enable recolonization; and • cool microclimate forest/woodland areas (e.g. protected gullies, sheltered high elevation areas, coastal lowland areas, southern slopes); and • areas identified as refuges under future climate changes scenarios; and • short-term or long-term post-fire refuges (i.e. unburnt habitat within or adjacent to recently burnt landscapes) that allow the species to persist, recover and recolonise burnt areas (Department of Climate Change, Energy, the Environment and Water 2022).	Considered Unlikely to occur.	
Petrogale penicillata Brush-tailed Rock-wallaby	Vulnerable	The range of the Brush-tailed Rock-wallaby extends from south-east Queensland to the Grampians in western Victoria, roughly following the line of the Great Dividing Range (OEH, 2013). Populations of the Brush-tailed Rock-wallaby occur, or did occur, throughout the Great Dividing Range from the border with NSW to Nanango, 100 km northwest of Brisbane. Brush-tailed Rock Wallabies occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures and caves. They browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees and shelter or bask during the day in rock crevices, caves and overhangs (Department of Agriculture, Water and the Environment 2021).	The site lacks rocky habitats where this species primarily occurs and is unlikely to support this species. Considered Highly Unlikely to occur.	Not considered a Subject species for the proposed activity
Phascolarctos cinereus Koala	Vulnerable	Koalas inhabit eucalyptus woodlands and forests and feed exclusively on trees of the *Eucalyptus*, *Angophora, Lophostemon* and *Melaleuca* genus' (DoE 2016). Preferred food and shelter trees are naturally abundant on fertile clay-like soils (DoE 2016).	The site contains known koala habitat and feed tree species, however the proposed development allows for the retention of the higher quality potential habitat recorded on site as well as associated fauna corridor. While the proposed development will result in the clearing of some koala habitat trees, the proposed clearing is at a small scale and within a highly disturbed area predominately characterised as derived woodland **RECORDED DURING THE SURVEY**	**Subject Species for the proposed activity**
Potorous tridactylus tridactylus	Vulnerable	The Northern Long-nosed potoroo has a broad, though highly fragmented distribution across two major bioregions (Southeast Queensland and New South Wales north coast) and occurs between Many Peaks Range (near Gladstone) in the north to the northern	The vegetation within the site does not contain a dense groundcover and is unlikely to support habitat for this species.	Not considered a Subject species for the proposed activity

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Long-Nosed Potoroo (SE mainland)		boundaries of the Sydney Basin .In Queensland, a few populations of the northern long-nosed potoroo exist in lowland heath and coastal habitats (Wide Bay Military Reserve in Tin Can Bay and nearby K'gari (Fraser Island). The Long-nosed Potoroo is known to occur in a wide variety of habitats including moist and dry forests, wet heathland and cool temperate rainforests with dense layers of grasses, ferns, vines or shrubs A 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 shrubs of tea-trees or melaleucas (OEH, 2014). Requires some form of dense vegetation for shelter and the presence of an abundant supply of fungi for food A sandy loam soil is also a common feature (Department of Agriculture, Water and the Environment 2022).	Considered Highly Unlikely to occur.	
Pseudomys novaehollandiae New Holland Mouse, Pookila	Vulnerable	The New Holland Mouse (*Pseudomys novaehollandiae)* has a fragmented distribution across Tasmania, Victoria, NSW and Queensland. The species is now largely restricted to the coast of central and northern NSW, with one inland occurrence near Parkes. The *P. novaehollandiae* has been found from coastal areas and up to 100 km inland on sandstone country and granite areas in New England Tablelands. The species has been recorded from sea level up to around 900 m above sea level. Across the species' range, the New Holland Mouse is known to inhabit heathlands, open forest and woodlands with heathy understorey and coastal dune vegetation. The species is a first coloniser after fire and has been found to peak in abundance during the early to mid-stages of vegetation succession three to five years after fire (Department of the Environment 2024). Soil types is considered an important habitat feature for the New Holland Mouse, with deeper topsoils and softer substrates being preferred for digging burrows including sands and sandy loams.	The study area does not support preferred soil types and heath vegetation associations. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Pteropus poliocephalus Grey-headed Flying-fox	Vulnerable	The Grey-headed Flying-fox occurs in a range of habitats including subtropical and temperate rainforests, dry and wet sclerophyll forests, Banksia woodland, heaths and Melaleuca swamps (Tidemann, Eby, Parry-Jones and Vardon, 1999). This species is a canopy-feeding frugivore and nectarivore found in sub-tropical and temperate rainforests, open tall sclerophyll forests, closed or open woodlands, heaths, Banksia woodlands and Melaleuca swamps, as well as urban gardens and cultivated fruit crops (OEH, 2015; DoE, 2016). Roosting camps are often in gullies, close to water (lakes, rivers or the coast), in vegetation with a dense canopy, and located within 20 km of a regular food source (OEH, 2015; DoE, 2016). Roost vegetation includes rainforest patches, stands of Melaleuca, mangroves and riparian vegetation (DoE, 2016).	The site contains suitable feed trees, and is expected to be utilised during the flowering of the Eucalypts, Corymbias and Angophoras occurring on the site. As a large proportion of the sites' habitats will be retained, the proposed activity is not expected to significantly impact this highly mobile species.	**Subject Species for the proposed activity**

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		Important winter and spring vegetation communities are those that contain *Eucalyptus tereticornis, E. albens, E. crebra, E. fibrosa, E. melliodora, E. paniculata, E. pilularis, E. robusta, E. seeana, E. sideroxylon, E. siderophloia, Banksia integrifolia, Castanospermum australe, Corymbia citriodora citriodora, C. eximia, C. maculata, Grevillea robusta, Melaleuca quinquenervia* or *Syncarpia glomulifera* (Eby and Law 2008; Eby 2016; Eby et al., 2019) Where the existence of these important winter and spring flowering vegetation communities is verified in the field, they are considered habitat critical to the survival of the Grey-headed Flying-fox. Back yard fruit trees, orchards or non-native trees that may be used for foraging are not considered to be habitat critical to the survival of the Grey Headed Flying-Fox. Habitat critical to the survival of the Grey-headed Flying-fox may also be vegetation communities not containing the above tree species but which: • contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May) • contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the Department's interactive flying-fox web viewer, or • contain native and or exotic species used for roosting at the site of a nationally important Grey-Headed Flying-Fox camp1 as identified on the Department's interactive flying-fox web viewer		
		REPTILES		
Caretta caretta Loggerhead Turtle	Endangered	The loggerhead turtle has a worldwide distribution in coastal tropical and subtropical waters. In Australia, loggerheads occur in coral reefs, bays and estuaries in tropical and warm temperate waters off the coast of Queensland, Northern Territory, Western Australia and New South Wales. This species is carnivorous, feeding predominantly on benthic invertebrates in habitats ranging from near shore to 55 m. During their post-hatchling stage, they feed on algae, pelagic crustaceans and molluscs. The female comes ashore to lay her eggs in a hole dug on the beach in tropical regions during the warmer months (Commonwealth of Australia 2017).	The site does not contain oceanic habitats for this species. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Chelonia mydas Green Turtle	Vulnerable	The Green Turtle has been recorded in coastal waters of all Australian states; however, this species predominantly occurs in tropical and subtropical waters, with some individuals straying into temperate waters, including coastal waters of NSW north coast (Cogger et al., 1993). This species migrates great distances between foraging grounds and nesting beaches, where they lay eggs in holes dug in beaches throughout their range. In Australia, major nest sites are known in the Great Barrier Reef and the Gulf of Carpentaria and WA (Cogger et al, 1993). The Green Turtle has been noted to be carnivorous when young; however, as adults, this species primarily feeds upon	The site does not contain estuarine or oceanic habitats. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity

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		seagrass and algae, and may also consume fish egg cases, jellyfish and sponges (Commonwealth of Australia 2017).		
Coeranoscincus reticulatus Three-toed Snake-tooth Skink	Vulnerable	The Three-toed Snake-tooth Skink (*Coeranoscincus reticulatus)* occurs from Crescent Head in north-east NSW to Fraser Island in south-east Queensland however most records are from the Border Ranges. In Queensland, the species has been recorded in rainforest, closed forest, wet sclerophyll forest, tall open Blackbutt (*Eucalyptus pilularis*) forest, tall layered open eucalypt forest and closed Brush Box (*Lophostemon confertus*) forest with abundant leaf litter and ground debris. Usually found in these habitats amongst deep litter, decaying logs and well mulched friable soil, in and under rotting logs, in forest litter, fallen epiphytes, under fallen hoop pine bark and has been recorded under decomposing cane mulch (Department of the Environment 2024).	The site does not support Rainforest of Wet sclerophyll forest types and lacks friable soil or moist rotting logs and leaf litter. Considered unlikely to occur	Not considered a Subject species for the proposed activity
Delma torquata Collared Delma	Vulnerable	The Collared Delma is endemic to Queensland. The closest recorded distribution of the collared delma is from the western suburbs of Brisbane, whereas other recorded locations have been the Bunya Mountains, Blackdown Tablelands National Park, Expedition National Park, Western Creek (Millmerran) and the Toowoomba Range (DoE 2016). Occurs in remnant and non-remnant woodlands and grasslands, also found in areas modified for agriculture. The Collared Delma has been recorded from a number of different soil types throughout south-east Queensland (e.g. sandy loams, grey and black cracking clays, stony lithosols and basalt derived Podzolics) on land zones 3, 9 and 10. 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 Department of the Environment (2024).	The site is 20-25 km from recorded populations of Collared Delmas in western Brisbane. Although the site supports remnant and non-remnant woodlands with a grassy understorey, the essential microhabitats of significant leaf litter does not occur on the site. Considered unlikely to occur	Not considered a Subject species for the proposed activity
Dermochelys coriacea Leatherback Turtle	Endangered	The Leather Leatherback Turtle occurs in all coastal waters of Australia, Leatherback turtles are more commonly found foraging in Australian waters along the east coast and in Bass Strait. The southern waters of Australia are one of five identified foraging sites with most sightings in temperate waters (Commonwealth of Australia 2017). This species is oceanic and therefore remain planktivorous throughout their life, feeding on jellyfish and large planktonic ascidians (e.g. sea squirts) in the water column. Most of the nesting in Australia appears to be low density and there are no major nest sites recorded in Australia.	The site does not contain oceanic habitats for this species. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Eretmochelys imbricata Hawksbill Turtle	Vulnerable	In Australia the Hawksbill Turtle (*Eretmochelys imbricata)* is found along the tropical coasts of northern and eastern Australia, from mid-western Western Australia to southern Queensland. The Hawksbill Turtle forages over coral reefs, rock outcroppings, and seagrass beds. The species is omnivorous, feeding on algae sponges, soft corals and other soft-bodied invertebrates. Nesting hawksbill turtles from the northern Great	The site does not contain estuarine or oceanic habitats. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity

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		Barrier Reef migrate to the Northern Territory, the southern coast of West Papua (formerly Irian Jaya) and Papua New Guinea. Hawksbill turtles that forage on the Great Barrier Reef migrate to neighbouring countries including Papua New Guinea, Vanuatu, and the Solomon Islands (Commonwealth of Australia 2017).		
Hemiaspis damelii Grey Snake	Endangered	Distributed throughout the eastern interior, from central inland New South Wales, north to coastal areas near Rockhampton in Queensland (Hobson 2012). Within Queensland, the core area for the grey snake in the Brigalow Belt is south of the Great Dividing Range between Dalby and Glenmorgan (Hobson 2012). *Hemiaspis damelii* favours woodlands (typically brigalow *Acacia harpophylla* and belah Casuarina cristata), usually on heavier, cracking clay soils, particularly in association with water bodies or in areas with small gullies and ditches (gilgais) (*Wilson and Swan 2010; Hobson 2012*). The species shelters in soil cracks, rocks, logs, flood debris, and abandoned burrows within these habitats. The diet of the Grey Snake is primarily composed of ground-dwelling frogs. However, tree frogs and, rarely, skinks also form part of the species' diet.	The only record in the locality is near Ipswich and review of the ALA record determined that this record is from a specimen collected in 1975 and the location accuracy of the record (Lat/Long) is only to 2 decimal places. The site does not contain appropriate habitats for the species. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Furina dunmalli Dunmall's snake	Vulnerable	The distribution of Dunmall's Snake (*Furina dunmalli)* extends from near the Queensland border throughout the Brigalow Belt South and Nandewar bioregions, as far south as Ashford in New South Wales (NSW). This species prefers Brigalow forest habitat with microhabitats consisting of fallen timber, leaf litter and deep cracking clays – which is common in Brigalow country. It has primarily been recorded in the Brigalow belt region at 200-500 m above sea level (Department of the Environment 2024).	The study area does not support habitats appropriate for the species. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Lepidochelys olivacea Olive Ridley Turtle, Pacific Ridley Turtle	Endangered	The Olive Ridley Turtle (*Lepidochelys olivacea)* has a circumtropical distribution, with nesting occurring throughout tropical waters (except the Gulf of Mexico) and migratory circuits in tropical and some subtropical areas. A substantial part of the immature and adult population forage over shallow benthic habitats from northern Western Australia to south-east Queensland (Department of the Environment (2024). No major breeding areas have been recorded in Australia, instead, Olive Ridley's appear to undertake solitary or low-density nesting with most recorded or inferred sites in the NT along the north-western coast of Cape York Peninsula (Department of the Environment (2024). The species is primarily carnivorous, feeding on soft-bodied invertebrates such as sea pens, soft corals, beche-der-mer (sea cucumbers) and jellyfish in depth between 15-200 m (Commonwealth of Australia 2017).	The site does not contain estuarine or oceanic habitats. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Natator depressus	Vulnerable	The Flatback Turtle *(Natator depressus)* is endemic to Australia and all known breeding sites of this species occur only in Australia. They feed in the northern coastal regions of	The site does not contain estuarine or oceanic habitats.	Not considered a Subject species for the proposed activity

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Flatback Turtle		Australia, extending as far south as the Tropic of Capricorn. Their feeding grounds also extend to the Indonesian archipelago and the Papua New Guinea coast. In eastern Queensland nesting occurs between Bundaberg in the south and northwards to Torres Strait. The main nesting sites occur in the southern Great Barrier Reef (GBR) at Peak, Wild Duck and Curtis Island Department of the Environment (2024). Primarily carnivorous, feeding on soft-bodied invertebrates. Juveniles eat gastropod molluscs, squid, siphonophores. Limited data indicate that cuttlefish, hydroids, soft corals, crinoids, molluscs and jellyfish are also eaten (Commonwealth of Australia 2017).	Considered highly unlikely to occur	
		PLANTS		
Arthraxon hispidus Hairy-joint Grass	Vulnerable	Hairy-joint Grass (*Arthraxon hispidus*) has been recorded from scattered locations throughout Queensland and on the northern tablelands and north coast of NSW and is usually found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps, as well as woodland (WetlandInfo, 2011). In the South-East Queensland Bioregion, *A. hispidus* 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 (WetlandInfo, 2011), and also with bog mosses in mound springs (Department of the Environment, Water, Heritage and the Arts 2008).	The species was not detected during the targeted threatened flora surveys and site lacks suitable habitat. Considered highly unlikely to occur.	Not considered a Subject species for the proposed activity
Bosistoa transversa Three-Leaved Bosistoa	Vulnerable	Three-leaved Bosistoa is known from the Richmond River, NSW, to Mt Larcom near Gladstone, Queensland. The species occurs in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 300 m in altitude. Associated vegetation includes *Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photinophylla, Acmena ingens, Diploglottis australis and Diospyros mabacea* (Department of the Environment, Water, Heritage and the Arts 2008).	The study area does not support any vegetation associations known to support this species. Considered highly unlikely to occur.	Not considered a Subject species for the proposed activity
Bulbophyllum globuliforme Miniature Moss-orchid, Hoop Pine Orchid	*Vulnerable*	*Bulbophyllum globuliforme* occurs in notophyll vine forest and some microphyll vine forest with *Araucaria cunninghamii* emergents at altitudes of 500 to 900 m. In Queensland, it appears to grow solely on the scaly bark of the branches and upper trunk of older hoop pine trees with other epiphytes. This orchid appears to favour the underside of tree limbs *(Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) 2012). Bulbophyllum globuliforme in Species Profile and Threats Database.*	No appropriate habitat for the species occurs within the study area or locality. Considered highly unlikely to occur.	Not considered a Subject species for the proposed activity
Coleus habrophyllus (syn Plectranthus habrophyllus)-	Endangered	*Coleus habrophyllus* is known from only six locations in south-east Queensland, between Ipswich and Ormeau. Three populations occur in White Rock Conservation Park, two in small corridors through urban areas, and one in a proposed quarry site	The site does not contain significant rocky outcrop habitats favoured by the species and	Not considered a Subject species for the proposed activity

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		(Forster, 1994; Queensland Herbarium, 2008). The total population size is unknown, but some of these sites record only a few plants present (Queensland Herbarium, 2008). *Coleus habrophyllus* occurs on rock outcrops of sandstone or chert in shaded situations in eucalypt woodland often close to vine forest (Department of the Environment, Water, Heritage and the Arts 2008a).	it was not detected during targeted surveys for the species. Considered unlikely to occur.	
Coleus nitidus (syn Plectranthus nitidus) Nightcap Plectranthus, Silver Plectranthus	Endangered	*Coleus nitidus* is restricted to south-east Queensland and north-east NSW, where it occurs from Nightcap Range north to the McPherson Range, over a distance of approximately 60 km ((Department of the Environment, Water, Heritage and the Arts 2008b). It forms small clumps in gullies and on boulders in rainforest or open forest on the margins of rainforest (Queensland Herbarium, 2008). It is recorded from Springbrook National Park, though it is not common at this site ((Department of the Environment, Water, Heritage and the Arts 2008).	The site does not contain rocky outcrops adjoining rainforest associations and the species was not detected during targeted surveys. Considered highly unlikely to occur.	Not considered a Subject species for the proposed activity
Coleus omissus (syn Plectranthus omissus)	Endangered	*Coleus omissus* is known from only five sites between the Conondale Ranges and Gayndah, Queensland. The population at one site is estimated to be only 30 to 40 plants (Halford, 1998). The species occurs within Conondale National park, Wratten Resource Reserve, Grongah National Park, Miva State Forest and Mudlo National Park. *Coleus omissus* has been recorded on steep rocky outcrops approximately 300-400 m above sea level on the margin of vine forest or sclerophyll forests (Department of Sustainability, Environment, Water, Heritage and the Arts 2012). *Plectranthus omissus* in Species Profile and Threats Database	The site does not contain rocky outcrops and was not detected during targeted surveys. Considered highly unlikely to occur.	Not considered a Subject species for the proposed activity
Corchorus cunninghamii Native Jute	Endangered	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 aspect. It also occurs on sheltered slopes, gullies and on lower slopes, depending on the topographic position of the sclerophyll-rainforest margin. Sites are at low to mid elevation (110-450 m above sea level) (Department of the Environment, Water, Heritage and the Arts 2008). Corchorus cunninghamii in Species Profile and Threats Database.	The site does not contain appropriate habitats for the species and was not detected during targeted threatened flora searches. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity
Croton mamillatus Bahrs Scrub Croton	Critically Endangered	*Croton mamillatus* is known from a restricted and disjunct distribution in the Caboolture, Beenleigh and Boonah localities, near Brisbane. *Croton mamillatus* grows as an understorey shrub in remnants of dry microphyll or notophyll vineforest on red rocky soils derived from chert, often on hillsides near rainforest margins (Threatened Species Scientific Committee 2023).	The site does not contain appropriate habitats for the species and was not detected during targeted threatened flora searches. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity
Cryptostylis hunteriana Leafless Tongue-orchid	Vulnerable	Leafless Tongue-orchid occurs in Victoria, NSW, and Queensland, where it is known from a single plant near the village of Tinnanbar and four additional coastal populations	Due to the variable nature of the Leafless Tongue-orchid habitat, and the short period	Not considered a Subject species for the proposed activity

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		north of the Glasshouse Mountains to Tin Can Bay. The species occurs mostly in coastal heathlands, margins of coastal swamps and sedgelands, coastal forest, dry woodland, and lowland forest. The soils include moist sands, moist to dry clay loam and occasionally in accumulated eucalypt leaves (Jones et al., 2006; Jones, 2006).	of detection when the species is flowering specific searches were undertaken on four separate occasions. While some aspects of the study areas 'habitat could potentially be appropriate for the species it was not detected during the targeted surveys and is not known in the locality. Considered as unlikely to occur.	
Cupaniopsis shirleyana Wedge-leaf Tuckeroo	Vulnerable	*Cupaniopsis shirleyana is* restricted to southeast Queensland, from Brisbane, north to Curtis Island. *Cupaniopsis shirleyana* is known from It occurs in Pine Mountain Reserve, Mt Gravatt, Cold Creek State Forest and Miva State Forest. *C. shirleyana* occurs at 20 to 550 m elevation. Recorded in a variety of rainforest types including vine thicket and dry rainforest. Occurs on hillsides, mountain tops, lower slopes of valleys, stream beds and along riverbanks. Grows in a variety of soil types (Department of the Environment, Water, Heritage and the Arts 2008).	The habitats of the study area do not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity
Cupaniopsis tomentella Boonah Tuckeroo	Vulnerable	Boonah Tuckeroo is known only from an area between Boonah and Ipswich in south-eastern Queensland where it is known to grow in vine thickets predominantly on fertile clay soils. (Department of the Environment, Water, Heritage and the Arts 2008)	The soils and habitats of the study area are not appropriate, and the Boonah Tuckeroo was not detected during the targeted flora surveys conducted within the study area. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity
Cupaniopsis shirleyana Wedge-Leaf Tuckeroo	Vulnerable	*Cupaniopsis shirleyana* is known to occur at elevations between 20 to 550 m in a variety of rainforest types including vine thicket and dry rainforest. Occurs on hillsides, mountain tops, and lower slopes of valleys, stream beds and along riverbanks. Grows in a variety of soil types (Department of the Environment, Water, Heritage and the Arts 2008).	The habitats of the study area are not appropriate for the species and the Wedge-Leaf Tuckeroo was not detected during the targeted flora surveys conducted within the study area. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity
Dichanthium setosum Bluegrass	Vulnerable	In Queensland, *Dichanthium setosumoccurs h*as been reported from the Leichhardt, Morton, North Kennedy and Port Curtis regions. *Dichanthium setosum*occurs in heavy soils (predominantly cracking clays or alluvium, often in gilgai) in woodland or open woodland usually dominated by Acacia (brigalow) and/or Eucalyptus species. The climate is tropical to subtropical and markedly seasonal with the habitat drying out for part of the year (Ayers, 1996). Associated with heavy basaltic black soils and red-brown loams with clay subsoil (Department of the Environment, Water, Heritage and the Arts 2008).	The site lacks suitable soils and was not detected during the targeted flora surveys conducted within the study area. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity

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Diploglottis campbellii *Small-leaved Tamarind*	Endangered	*Diploglottis campbellii* is a rainforest tree northern New South Wales and southeastern Queensland in the Mudgeeraba Creek Area (OEH 2024). *D. campbellii* is generally confined to the warm subtropical rainforest associations including lowland subtropical rainforest to drier subtropical rainforest with a Brush Box open overstorey. It is confined to the NSW/Queensland border lowlands and adjacent low ranges on basalt-derived soils and also on poorer soils such as those derived from quartz monzonite (Office of Environment and Heritage 2024).	The habitats of the study area do not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity
Endiandra floydii *Floyd's Walnut, Crystal Creek Walnut*	*Endangered*	*Endiandra floydii* is confined to warm temperate, subtropical rainforest or wet sclerophyll forest with Brush Box overstorey, and in and Camphor Laurel forest within the Tweed, Brunswick Valleys and Byron Bay area of north-east NSW, and south-east Queensland. The species generally prefers sheltered locations however it has been recorded on ridgelines, slopes, gullies and creek flats from sea level up to 430 m above sea level (Office of Environment and Heritage 2024b).	The habitats of the study area do not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered Highly unlikely to occur	Not considered a Subject species for the proposed activity
Fontainea venosa	Vulnerable	*Fontainea venosa occurs south west of Beenleigh near Brisbane, in the Boyne Valley, and near Littlemore, in Queensland. The species is located within Dawes National Park State and Marys Creek State Forest (Queensland Herbarium, 2012). 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. Associated species include *Backhousia citriodora*, *Actephila lindleyi*, *Bosistoa medicinalis*, *Diospyros fasciculosa*, *Barkly syringifolia*, *Araucaria cunninghamii*, *Owenia venosa*, *Aphananthe philippinensis*, *Argyrodendron trifoliolatum*, *Croton acronychioides*, *Pentaceras australe* and *Planchonella myrsinoides* (Department of Sustainability, Environment, Water, Population and Communities 2012).	The habitats of the study area do not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Gossia gonoclada Angle-stemmed Myrtle	Endangered	*Gossia gonoclada* is currently known from sites along the lower reaches of the Brisbane and Logan Rivers and their tributaries. *G. gonoclada* is confined to lowland riparian rainforest /notophyll vine forest, along permanent watercourses. It usually grows below the peak flood level, on steep slopes and at low elevations of 5-50m. It occurs on clay soils, sandy loams and alluvial soils. (*A. gonoclada* Recovery Team 2001, Department of the Environment, Water, Heritage and the Arts (2008). Gossia gonoclada in Species Profile and Threats Database)	The habitats of the study area do not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Haloragis exalata subsp. velutina Tall Velvet Sea-berry	Vulnerable	Tall Velvet Sea-berry *(Haloragis exalata subsp. velutina)* occurs on the north coast of NSW and in south-east Queensland from near Kempsey, north to Carnarvon National Park (NP). In Queensland, it occurs in rainforest and rainforest margins and adjacent grassland and open grassy woodland above 500 metres altitude (Queensland CRA/RFA Steering Committee, 1998; Queensland Herbarium, 2008). Associated species include	The study area does not support appropriate habitat, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity

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		Broad-leaved Apple (*Angophora subvelutina*), Forest Redgum (*Eucalyptus tereticornis*), Green Wattle (*Acacia irrorata*), and *Scutellaria humilis*. The species has been recorded growing on brown heavy clay shallow rock loam, and basaltic soils (Department of the Environment, Water, Heritage and the Arts 2008).		
Leichhardtia longiloba (syn Marsdenia longiloba) Clear Milkvine	Vulnerable	Clear Milkvine is known from scattered sites on the NSW north coast from Hastings River northwards to Mount Nebo in Queensland. Clear Milkvine grows in open eucalypt forest, or margins of subtropical and warm temperate rainforest, and on rocky outcrops. Associated species include *Eucalyptus crebra, E. microcorys, E. acmenoides, E. saligna, E. propinqua, Corymbia intermedia and Lophostemon confertus* (Department of the Environment, Water, Heritage and the Arts 2008).	The habitats within the site provide some potential habitat for the Clear Milkvine, however the species was not recorded despite targeted searches for the species. Considered as unlikely to occur	Not considered a Subject species for the proposed activity
Lepidium peregrinum Wandering Pepper-cress	Endangered	Wandering Pepper-cress *(Lepidium peregrinum)* occurs from the Bunya Mountains, south-east Queensland, to near Tenterfield, in northern New South Wales. In Queensland the species is known for near Beechmont, the D'Aguilar Range, Deer Reserve State Forest near Kilcoy, Condamine Gorge near Killarney, Picnic Point and Highfields Falls near Toowoomba and Mt Glorious areas (Queensland Herbarium, 2024). Habitat data is largely deficient with the only available information from the Clifton population where it is reported to occur in an open riparian forest on sandy alluvium. Associated floristics of the site include *Eucalyptus camaldulensis* and *Casuarina cunninghamiana*, with a variably dense shrubby understorey of *Hymenanthera dentata, Bursaria spinosa, Acacia fimbriata, Acacia floribunda, Callistemon viminalis* and *Leptospermum brachyandrum. Lepidium peregrinum* was most abundant in the tussock grassland fringe of the riparian open forest, comprising *Poa* species, *Lomandra longifolia* and *Paspalum dilatatum* (Threatened Species Scientific Committee 2005).	The study area does not support any appropriate habitat for the species. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Macadamia integrifolia Macadamia Nut	Vulnerable	Macadamia Nut (*Macadamia integrifolia*) occurs from Mt Bauple, near Gympie, to Currumbin Valley in the Gold Coast hinterland, south-east Queensland. The species was known to occur in north-east New South Wales; was described from specimens from Camden Haven, and there are specimens also from Lismore. Macadamia integrifolia preferred habaitats are within lowland warm complex notophyll vine forest and *Araucarian* notophyll vine forest, which occur on basic and intermediate volcanics and alluvia in higher rainfall areas of southeast Queensland. This species occupies all topographic positions including ridges, scree slopes, foot slopes, gullies, benches and riverine terraces. Soils are predominantly alluvial or volcanic, well drained, often with significant surface exposure of rock fragments. Macadamia integrifolia is found in several rainforest regional ecosystems including complex notophyll vine forest, simple notophyll vine	The habitats of the study area do not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity

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		forest and simple microphyll-notophyll vine forest with emergent *Araucaria* and *Argyrodendron* (Costello, G. et al 2009, DCCEEW 2023).		
Macadamia ternifolia *Small-fruited Queensland Nut, Gympie Nut*	Vulnerable	Small-fruited Queensland Nut (*Macadamia ternifolia)* is endemic to Queensland with scattered populations extending from Goomboorian (north of Gympie), south to Mt Nebo northwest of Brisbane. *Macadamia ternifolia* is found within lowland warm complex notophyll vine forest and Araucarian notophyll vine forest predominantly on basic and intermediate volcanics and alluvia 15–700 m above sea level (ASL) in higher rainfall areas (DCCEEW 2023).	The study area does not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Macadamia tetraphylla Rough-shelled Bush Nut	Vulnerable	The Rough-shelled Bush Nut (*Macadamia tetraphylla)* is endemic to eastern Australia, from the Coomera River south of Brisbane to the Richmond River in northern New South Wales, and an altitudinal range of 100-800m. Rough-shelled Bush Nut is a rare species that generally occurs in subtropical rainforest and complex notophyll vineforest, littoral rainforest and at the margins of these forests and in mixed sclerophyll forest. It occurs in restricted habitat, growing on moderate to steep hillslopes on alluvial soils at well-drained sites (Costello, G. et al 2009).	The habitats of the study area do not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Notelaea lloydii Lloyd's olive	Vulnerable	The species occurs on undulating to hilly terrain either in moist gullies or on gentle to steep dry slopes but is rarely found on rocky outcrops. Soil types are mostly shallow, well drained and stony to very rocky in texture (Guymer 1987; Qld CRA/RFA Steering Committee 1998). Lloyd's Olive is found in the ecotone between eucalypt open forests and vine thickets (Guymer 1987) at 80-480 m above sea level (asl) (Qld CRA/RFA Steering Committee 1998). The more frequent tree species recorded with this species are Narrow-leaved Ironbark (*Eucalyptus crebra*), Spotted Gum (*Corymbia maculata*), White Mahogany (*E. acmenoides*), Lemon-scented gum (*C. citriodora*) and Curracabah (*Acacia concurrens*) with associated trees and shrubs of Kurrajong (*Brachychiton populneus*), Red Ash (*Alphitonia excelsa*), Brown Salwood (A. aulacocarpa), Burra (*A. falcata*) and Ebony (*Diospyros ferrea var. geminata*) (Guymer 1987; Qld CRA/RFA Steering Committee 1998	The study area does not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Notelaea x ipsviciensis Cooneana olive	Critically Endangered	The Cooneana Olive is known from only three closely clustered sub-populations in the Ipswich area of southern Queensland. Total extent of occurrence is less than 2 km^2, and total number of specimens is 17 (all mature). The Cooneana Olive grows as an understorey plant in open woodlands and is primarily associated with eucalypt-dominated dry sclerophyll communities situated on poor, sandstone-based soils (Lock et al., 2004; Beyleveld, 2006, 2007). This species occurs within the South-East Queensland Natural Resource Management Region (DoE, 20016).	While the site offers some marginal habitat that is considered potentially suitable for this species, detailed searches conducted in 2021 and 2024 failed to detect the species. Considered unlikely to occur	Not considered a Subject species for the proposed activity

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Persicaria elatior Knotweed, Tall Knotweed	Vulnerable	Knotweed (*Persicaria elatior)* is known from the North Coast, Central Coast, and South Coast botanical subdivisions of NSW and the Moreton Pastoral District in south-east Queensland. Knotweed grows on sandy, alluvial soil in swampy areas and riparian herblands along watercourses and lake edges. Associated plant species include *Melaleuca linearifolia, M. quinquenervia, Pseudognaphalium luteoalbum, Persicaria hydropiper, Floydia praealta* and *Cyperus semifertilis* (Department of the Environment, Water, Heritage and the Arts 2008).	The study area does not support wetlands or significant riparian habitats, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Phaius australis Lesser Swamp-Orchid	Endangered	*Phaius australis* grows in areas where soils are almost always damp, but not flooded for lengthy periods (WetlandInfo, 2008). Sands are generally the underlying soil type. *P. australis* is usually found in coastal habitats between swamps and forests or in suitable areas further inland. This includes swampy sclerophyll forest dominated by melaleucas, swampy forest that often have scleorphyll emergents, or fringing open forest and melaleuca swamp forest associated with rainforest species (WetlandInfo, 2008). *P. australis* has also been recorded in wallum, sedgeland, rainforest and closed forest. They often grow in deep shade, but can also occur in full sun (WetlandInfo, 2008, Department of the Environment 2014).	The study area does not support wetlands or significant riparian habitats, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Picris evae Hawkweed	Vulnerable	Hawkweed (*Picris evae)* occurs north of the Inverell area in NSW and has been collected near Inverell, Tamworth the NSW northern tablelands, Northern Rivers and at sites in the Darling Downs and Moreton pastoral districts in south-east Queensland Hawkweed occurs in Eucalyptus open woodland with a grassy understorey composed of *Dichanthium spp*. Upper stratum species include *Eucalyptus melliodora, E. crebra, E. populnea, E. albens, Angophora subvelutina, Allocasuarina torulosa, and Casuarina cunninghamiana* (Holzapfel, 1994). Collections have been made along roadsides and in cultivated areas, such as paddocks, on black, dark grey or red-brown soils, reddish clay-loam or medium clay soils (Department of the Environment, Water, Heritage and the Arts 2008).	While the site offers some marginal habitat that is considered potentially suitable for this species, detailed searches conducted in 2021 and 2024 failed to detect the species. Considered unlikely to occur	Not considered a Subject species for the proposed activity
Pouteria eerwah (syn Planchonella eerwah) Shiny-leaved Condoo, Black Plum, Wild Apple	Endangered	*Pouteria eerwah* is restricted to three areas of south-east Queensland: the Ipswich-Beaudesert area south-west of Brisbane; the Beenleigh–Ormeau–Pimpama area, south-east of Brisbane; and the Nambour–Maleny district on the Sunshine coast. Populations in the Ipswich- Beaudesert area occur on rocky slopes and drainage lines on a variety of soils. The species has been found to occur in Araucarian Notophyll Vine Forest and Araucarian Microphyll Vine Forest dominated by *Flindersia* species, with occasional emergent *Araucaria cunninghamii* and *Harpullia pendula*. The northern populations occur in the canopy and lower strata of remnant Complex Notophyll Vine Forest, *Atalaya multiflora, Choricarpia subargentea, Excoecaria dallachyana, and*	The study area does not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity

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		Flindersia australis (Department of the Environment, Water, Heritage and the Arts 2008).		
Rhaponticum australe Austral Cornflower, Native Thistle	Vulnerable	Austral Cornflower *(Rhaponticum australe)* is known from Mt Moffatt, Monto to Biloela, the eastern Darling Downs to Gatton in Queensland. This species was previously known from NSW and Victoria but is now presumed extinct in these two states. *R. australe* grows in eucalypt open forest with a grassy understory and in grasslands on black clay soil. It is often found on roadsides and on road or rail reserves associated with *Chloris gayana*, *Cirsium vulgare*, *Eucalyptus tereticornis* and *Angophora floribunda* (Queensland Herbarium, 2012, Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) 2012).	While the study area supports a eucalypt open forest/woodland community the soils are not typical of the black clays of the Darling Downs areas from which the species is known. The species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood	Critically Endangered	Scrub Turpentine (*Rhodamnia rubescens*) is known to occur from coastal districts of NSW north from Batemans Bay to Bundaberg in Queensland and occasionally extends inland onto the escarpment up to 600 m in areas with rainfall of 1,000-1,600mm. *R. rubescens* commonly occurs in all rain forest subforms except cool temperate rainforest. The species occupies a range of volcanically derived and sedimentary soils and is a common pioneer species in eucalypt forests and are often found in wet sclerophyll associations in rainforest transition zones and creekside riparian associations (Threatened Species Scientific Committee 2020).	The study area does not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Rhodomyrtus psidioides Native Guava	Critically endangered	Native Guava (*Rhodomyrtus psidioides*) is known to occur from coastal districts of NSW north from Gosford to Maryborough in Queensland typically occurring in coastal and sub-coastal areas of low elevation however, the species does occur up to c. 120km inland in the Hunter and Clarence River catchments and along the Border Ranges. R. psidioides can potentially occur in Subtropical Rainforests, Warm Temperate Rainforests, Littoral Rainforest, and Wet Sclerophyll Forests and may be found in the adjoining margins of sclerophyll vegetation associated with any of these rainforest formations (Threatened Species Scientific Committee 2020).	The study area does not support any rainforest associations, and the species was not detected during the targeted flora surveys conducted within the study area. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Samadera bidwillii Quassia	Vulnerable	Quassia (*Samadera bidwillii*) is endemic to Queensland and is currently known to occur in several localities between Scawfell Island, near Mackay, and Goomboorian, north of Gympie. S. bidwillii commonly occurs in lowland rainforest often with Araucaria cunninghamii or on rainforest margins, but it can also be found in other forest types, such as open forest and woodland, it is commonly found in areas adjacent to both temporary and permanent watercourses up to 510 m altitude. Commonly associated trees in the open forest and woodlands include spotted gum (*Corymbia citriodora*), grey gum (*Eucalyptus propinqua*), white mahogany (*E. acmenoides*), forest red gum (*E. tereticornis*), pink bloodwood (*Corymbia intermedia*), ironbark (*E. siderophloia*), gum	Unlikely that this species could occur on site due to the lack of suitable habitat. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity

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		topped box (*E. moluccana*), Gympie messmate (*E. cloeziana*) and broad- leaved ironbark *(E. fibrosa*) (Department of the Environment, Water, Heritage and the Arts 2008).		
Sarcochilus fitzgeraldii Ravine Orchid	Vulnerable	The Ravine Orchid (*Sarcochilus fitzgeraldii*) grows in shady areas, usually near streams, from 500 to 700 m altitude, mainly on rocks and sometimes on trees, in cool, moist ravines in the coastal subtropical rainforests and open forests of northern NSW north of the Macleay River to Maleny in south-east Queensland (Department of the Environment, Water, Heritage and the Arts 2008).	The study area does not support any appropriate habitat for the species. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Sophora fraseri Brush Sophora	Vulnerable	Brush Sophora (*Sophora fraseri*) is restricted to south-eastern Queensland and north-eastern New South Wales from the Casino to near Miriam Vale. *S. fraseri* is a subtropical shrub, that normally grows in wet sclerophyll forest and a range of rainforest types. It has been reported growing in hilly terrain on hillslopes at altitudes at altitudes from 60 to 660m, mostly shallow stony to shaly soils, of loam to clay texture derived from sandstone or basalt rocks. Associated species include: Corymbia citriodora, Eucalyptus carnea, E. microcorys, E. acmenoides, E. propinqua and Lophostemon confertus. The shrub appears to prefer growing along rainforest margins, in eucalypt forests in the vicinity of rainforests or in large canopy gaps in closed forest communities (Barker and Borsboom, 1997; Queensland Herbarium, 2012).	The study area does not support any appropriate habitat for the species. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity
Thesium australe Toadflax	Vulnerable	Toadflax (*Thesium australe)* occurs in New South Wales, the Australian Capital Territory, Queensland and Victoria. In Queensland the species is known from Bundaberg to Dalby, south to the NSW border and west to Carnarvon NP. *T. australe* is a semi-parasitic plant growing on the roots of a range of grass species, particularly kangaroo grass (*Themeda triandra*) in grassland or woodland, often in damp sites (WetlandInfo, 2012). It occurs in subtropical, temperate and subalpine climates over a wide range of altitudes. It occurs on soils derived from sedimentary, igneous and metamorphic geology on a range of soils including black clay loams to yellow podzolics and peaty loams. Examples of associated vegetation includes: open woodland with *Eucalyptus tereticornis* and *E. tindaliae* on skeletal soils; on heavy alluvium soil in grassy *E. populnea* woodland; on black cracking clay in grassland of *Dichanthium sericeum*; and grassland dominated by *Themeda triandra* and *Heteropogon contortus* on basaltic, rocky soils (WetlandInfo, 2012, Department of the Environment 2013).	While the sites habitats include open forest /Woodland with a grassy understorey the soil types and moisture content of the substrate are not typical of the known locations of the species. Considered highly unlikely to occur	Not considered a Subject species for the proposed activity

6.2 MNES Significant Impact Assessment – Listed Threatened Ecological Communities, Species and Migratory Species

The following MNES Impact Assessment - Listed Threatened Species Ecological Communities and Listed Migratory Species has been undertaken in accordance with the Significant Impact Guideline 1.1. – Matters of National Environmental Significance (hereafter referred to as the "DoE Guideline") (DoE, 2013).

The Significant Impact assessment addresses species determined as Subject species in the Likelihood of Occurrence Assessment (**TABLE 6.1)** and applies the relevant MNES Significant Impact Criteria according to the Species or communities' respective EPBC Act conservation status.

The Significant impact assessment takes into account the nature and magnitude of potential impacts with consideration to matters including, but not limited to:

- the sensitivity of the environment which will be impacted
- the timing, duration and frequency of the action and its impacts
- all on-site and off-site impacts
- all direct and indirect impacts
- the total impact which can be attributed to the action over the entire geographic area affected, and over time
- existing levels of impact from other sources, and
- the degree of confidence with which the impacts of the action are known and understood.

In preparing the assessment relevant information is reviewed from various sources such as habitat, distribution, extent of occurrence and decline information and threatening process including the basis of determinations, Conservation Advice or information actions and priorities, information related to the recovery of the species or community as detailed in any draft or Approved recovery plan for the species or ecological community and, habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

The significant impact assessment also takes into the account the controls and mitigation measures that will be incorporated in the proposed development however, in accordance with the DOE 2013 Guideline, the assessment of significant impact does not consider the action is not likely to have the potential for a significant impact to occur because of management or mitigation measures **unless** the effectiveness of those measures is well-established (for example through demonstrated application, studies or surveys) and there is a high degree of certainty about the avoidance of impacts or the extent to which impacts will be reduced.

6.2.1 Definitions

A '**population of a species'** is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

• a geographically distinct regional population, or collection of local populations, or

• a population, or collection of local populations, that occurs within a particular bioregion.

An **'important population'** is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

• key source populations either for breeding or dispersal

• populations that are necessary for maintaining genetic diversity, and/or

• populations that are near the limit of the species range ((DoE, 2013).

'Population', in relation to migratory species, means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries including Australia.

An **'invasive species'** is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources, or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

Habitat critical to the survival of a species or ecological community'

'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

• for activities such as foraging, breeding, roosting, or dispersal

• for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)

• to maintain genetic diversity and long-term evolutionary development, or

• for the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

Area of Occupancy

Area of Occupancy is considered in accordance with the approach adopted in relevant recovery Plans (Such as the National Recovery defined as The area within the extent of occurrence (distribution) that is occupied by the species using 2 x 2 km grid cells (IUCN 2019). When adopting the Recovery plan definition of occupancy, the activity could not be considered as impacting the area of occupancy of the species.

Important habitat for a migratory species

An area of 'important habitat' for a migratory species is:

a) habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or

b) habitat that is of critical importance to the species at particular life-cycle stages, and/or

c) habitat utilised by a migratory species which is at the limit of the species range, and/or

d) habitat within an area where the species is declining.

Ecologically Significant Proportion

Listed migratory species cover a broad range of species with different life cycles and population sizes. Therefore, what is an 'ecologically significant proportion' of the population varies with the species (each circumstance will need to be evaluated). Some factors that should be considered include the species' population status, genetic distinctiveness and species-specific behavioural patterns (for example, site fidelity and dispersal rates).

6.2.2 Identification of Subject Species

The Assessment of Likelihood of Occurrence (**TABLE 6.1**) determined that only two species are considered as known or potentially occurring and, could be considered as Subject Species that could be potentially impacted by the proposed activity and as such require detailed assessment against the relevant criteria in the Matters of National Environmental Significance - Significant Impact Guidelines 1.1 (DoE 2013).

The two species are the Koala (*Phascolarctos cinereus*) and Grey-headed Flying fox (*Pteropus poliocephalus*). Additional details on the species habitat, lifecycle, occurrence on the site and the assessment against significant impact criteria is detailed in the sections below.

6.3 Significant Impact Assessment - Critically Endangered and Endangered species

6.3.1 Koala (Phascolarctos cinereus)

Conservation Status

The Koala (*Phascolarctos cinereus*) population that occurs in Queensland (Koala) is listed as part of the ***Phascolarctos cinereus* (Koala) combined koala populations of Queensland, New South Wales and the Australian Capital Territory** and was declared to be a species for the purposes of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act) on 27 April 2012 and listed in the Vulnerable category of the threatened species list under the EPBC Act effective from 2 May 2012.

The listed population was reassessed in 2021 by the Threatened Species Scientific Committee and determined to be eligible for listing as **Endangered** and came into effect under the *Environment Protection and Biodiversity Conservation Act* 1999 from 12 February 2022

The updated Conservation Advice for the Koala describes habitat as "*areas that are typically characterised by Eucalyptus forests and woodlands. Biophysical habitat attributes for the koala include places that contain the resources necessary for individual foraging, survival (including predator avoidance), growth, reproduction and movement*" (DAWE, 2022)

Habitat critical to the survival of the species is defined as;

"*the areas that the species relies on to avoid or halt decline and promote the recovery of the species. Under the EPBC act, the following factors and other relevant factors are considered when identifying habitat that is critical to the survival of the species:*

(a) Whether the habitat is used during periods of stress (examples: flood, drought or fire);

(b) whether the habitat is used to meet essential life cycle requirements (examples: foraging, breeding, nesting, roosting, social behaviour patterns or seed dispersal processes);

(c) the extent to which the habitat is used by important populations;

(d) whether the habitat is necessary to maintain genetic diversity and long- term evolutionary development;

(e) whether the habitat is necessary for use as corridors to allow the species to move freely between sites used to meet essential life cycle requirements;

(f) whether the habitat is necessary to ensure the long-term future of the species or ecological community through reintroduction or re- colonisation;

(g) any other way in which habitat may be critical to the survival of a listed threatened species or a listed threatened ecological community."

Occurrence in the Subject Area

Based on field surveys the site is known to be utilised by the Koala on an infrequent yet, regular basis evidenced by low numbers of scats scratches detected using a Koala scat search surveys in 2020, 2021, and recently in 2024.

The formal KSAT surveys undertaken in 2021 and 2024 showed preference for certain areas of the site with the activity levels recorded during the KSATs were reviewed as follows:

- Two (2) sites KSAT 2 and KSAT 4, both recorded scats at one (1) single tree each KSAT (from 30 searched) equating to a 3.3% activity level, both KSAT sites occurred within the development footprint
- At both KSAT 3 and KSAT 5, two (2) trees were recorded with scats equating to an activity level of 6.7%. KSAT 3 was undertaken within the development footprint while KSAT 5 was undertaken in the retained conversation and corridor area in the west of the site.
- The highest activity was recorded in the east-west conservation corridor at KSAT 1 with an activity level of 13.4% based on four (4) trees with scats detected.

This considered, the Study Area contains varied Koala habitat, both in amount and type of habitat. For the purposes of defining habitat across the Study Area, habitat has been delineated into breeding/foraging habitat, and dispersal habitat. This is due to the differing quality of the habitat,

The 2020 KSAT surveys identified an occasional usage of the site as identified by both old and recent scats and scratches. The relative ages of these Koala signs indicated three periods in which the site was used, possibly dating back to more than 12 months prior to the 2020 surveys. The most recent scats were of a size that represented a sub-adult potentially indicating it that was dispersing through the area.

The activity levels recorded during 2020 surveys ranged from 3.3% (1 tree with scat from 30 searched) to 13.3 %,(4 trees with scats from 30 searched). The results of the KSATs showed that the highest activity KSAT area was within the conservation area along the southern boundary of the site and that one (1) of the two (2) incidences of higher activity (6.3%) occurred in the conservation area corridor area in the north of the site. The two (2) lowest activity KSATs were in the proposed development footprint. In total, four (4) trees with scats were identified within the development area from three (3) KSATs while six (6) trees with scats were recorded from only two (2) KSATs conducted within the conservation area.

The subsequent surveys undertaken using an adapted KRAM methodology during August 2021 also detected Koala utilisation of the site. These scats were recent indicating that the site had been utilised since November 2021. Similar to the KSAT surveys, only a small number of trees were used, further indicating that Koala habitat utilisation was sporadic and for movement between higher quality habitats.

The Koala usage did not appear to be for regular foraging purposes, as there appeared no overlap of usage areas, i.e. no trees had both old and more recent scats detected at the same tree. In high usage areas/ important foraging habitats, it is extremely common to detect scats of differing ages reflecting repeat visitation of the tree(s) for foraging purposes, with high numbers of scats indicating some significant time was spent in each tree. As the Koala records across the site are sparse and, scats were recorded in low abundance, it is a potential indication that the site was not used as a preferred foraging area but instead, as a corridor to access higher quality habitat areas in the locality with occasion trees used during these movements. In the immediate locality, there are a number of areas containing higher utility tree species (preferred feed tree species) such as Forest Red Gums (E. tereticornis) associated with the alluvial and colluvial flats of Woogaroo Creek and its tributaries. As such, the value of the site's habitats appears to be limited to the occasional utilisation of feed trees such as the Grey Gums (E. major/propinqua) occurring within the site.

The August 2021 surveys included a qualitative and quantitative methodology devised to provide a comparative formalised assessment of the habitat values of areas of the site using 50 x 50m Koala habitat value plots. As detailed in the results, nine (9) plots were conducted in total which were used to determine the relative abundance of Non Juvenile Koala Habitat Trees (NJKHT) with data on the age class cohorts (based on DBH) and the relative abundance of low, medium and high utility tree species also collected. The results indicate that the retained corridors and conservation areas demonstrated higher abundances of NJKHTs than the proposed development area. The results also indicate that the relative abundance of High utility Koala tree species, such as E. tereticornis and E. major/propinqua were in greater relative abundance in the conservation areas.

The proposed development would result in the removal of Koala habitat which would result in a reduction in Koala sheltering and foraging resources in the site's locality. The proposed development will also reduce the width of the ecological corridor along the Church Street boundary. Currently, both Bertha Street and Church Street appear to be a considerable barrier to Koala movement through the site and these two (2) roads are probably the single greatest threat to individuals due to the high potential for road strike.

The proposed development through the retention of part of the site, active maintenance of corridors and installation of traffic calming devices, or reduced speeds, signage and lighting at crossing areas, in accordance with an approved koala management plan (incorporating koala sensitive design) is unlikely to alone significantly impact the local koala population.

Here is it noted that strategic retention of site vegetation, existing corridors, waterway corridors and KHA/regulated vegetation of the site would allow for retention of potential habitat resources for other Threat-listed species known to occur in the site's locality.

TABLE 6.2 presents a review of project impacts on koala against the Significant Impact Guidelines (EPBC Act Policy Statement 1.1).

TABLE 6.3: SIGNIFICANT IMPACT ASSESSMENT - KOALA

SIGNIFICANT IMPACT CRITERIA	ASSESSMENT AGAINST SIGNIFICANT IMPACT CRITERIA
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of a population	Based on field surveys the site is known to be utilised by the Koala, as evidenced by low numbers of scats and scratches detected using a formal KSAT method. The 2020 surveys only detected the usage at 4 trees from 3 formal KSAT searches within the proposed development area and the usage of 6 trees from 32 KSATs undertaken in the conservation area. The koala activity levels recorded during 2020 surveys also suggested that the site did not appear to be used regularly for foraging purposes, as there appeared to little repeat usage of the site's trees, i.e., no trees had both old and more recent scats detected at the same tree. The additional KSAT surveys conducted in September 2024 obtained similar results to the previous surveys and indicated usage of the sites habitats on two occasions since previous surveys (a period of 4 years) based on the age of visual assessment of the age of scats (indicated by decomposition). Similar to the 2020 results, activity levels were generally low across the site but ranged from zero activity (recorded at three KSAT sites) to one plot with medium usage. Similar to the 2020 results the Koala activity demonstrated that, although most of the site is used sporadically, the Conservation Area consistently recorded the higher utilisation. As the Koala records across the site are sparse and, scats were recorded in low abundance, it is a potential indication that the site was not used as a preferred foraging area but instead, as a corridor to access higher quality habitat areas in the locality with occasion trees used during these movements. In the immediate locality, there are several areas containing higher utility tree species (preferred feed tree species) such as Forest Red Gums (E. tereticornis) associated with the alluvial and colluvial soils in the conservation reserve to the west of Church Street and the Ric Natrass Conservation area is known to provide high quality habitat for the species. As such, based the low frequency of use recorded, the low activity levels recorded and that, the higher use areas are to be retained. It is not considered that the prosed development area provides sufficient preferred resources for the species that its loss would significant impact the food availability to the extent that it would lead to a decrease in the size of a population Under the Significant Impact Guidelines: A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to: » a geographically distinct regional population, or collection of local populations, or » a population, or collection of local populations, that occurs within a particular bioregion. The Koala population in South-East Qld and specifically in the Goodna/Greenbank /Springfield region extends over a large geographic area, has large areas of intact vegetation and is connected in many areas via corridors the local population of Koala in the Goodna locality would be considered as part of this larger population. **The action is not considered as likely to lead to a long-term decrease in the size of a population**
Reduce the area of occupancy of the species	While the development will result in the removal of 5.22 ha of Koala habitat, the activity incorporates a conservation area that will be subject to ongoing active management including active tree planting, assisted regeneration and weed management. These management measures in the conservation area, and within the development footprint as per the approved plans, will provide a safe refuge and movement corridor and will result and increase in the number and allow for the succession of, and maturation of existing preferred koala feed trees within the site. The proposed development will remove only a small area of known Koala habitat which demonstrates low koala activity levels and infrequent usage for both foraging and movement. Given that Koala sensitive design principles have been incorporated into the development and, a comprehensive suite of management measures are required as conditions for State approval against the Nature Conservation (Koala) Conservation Plan 2017, the removal of less than 5.22 ha of Koala habitat is considered to pose a small potential for significant impact on the spatial area of occupancy of the species. The National Recovery Plan for the Koala (Phascolarctos cinereus) (combined populations of Queensland, New South Wales and the Australian Capital Territory) defines the Area of Occupancy as *The area within the extent of occurrence (distribution) that is occupied by the species using 2 x 2 km grid cells (IUCN 2019).* When adopting the Recovery plan definition of occupancy, the activity could not be considered as impacting the area of occupancy of the species. As such, when the activity is evaluated on the basis of the approved management plans and actions and, the high likelihood of improvements in habitat quality, reduction of known threats and with some certainty that the measures should increase the Koalas habitat utilisation of the site, the activity could therefore result in the potential for significant impact however residual impacts will be reduced to levels that would be extremely low to negligible. **The action is considered as resulting in a Reduction in the area of occupancy of the species**
Fragment an existing population into two or more populations	The development itself has been designed to avoid barriers to movement and where practical will facilitate koala movement throughout the site through the use of preferred koala food trees in landscaping, the use of koala friendly fencing throughout (except the fenced dog exercise area) and has been designed to avoid any threatening processes usually associated with residential development including restrictions on dog ownership. The conservation area contains wide corridors containing known koala habitat which will provide a functional connection to known Koala habitats in all directions of the site. **The action will not fragment an existing population into two or more populations.**
Adversely affect habitat critical to the survival of a species	The site is known to provide habitats used by the Koala for foraging, shelter, movement and, potentially breeding and dispersal purposes. As such, the habitat within the proposed development footprint and conservation areas is considered as habitat critical to the survival of a species in accordance with the definition under the recovery plan. The studies found that there is a marked difference in the number and density of Non Juvenile Koala Habitat Trees (NJKHTs) within the proposed development footprint and within the approved conservation areas. The plots in the development area ranged between 69 – 116 NJKHTs in the development footprint, compared to a range of 121 to 156 NJKHs in the conservation areas.

TABLE 6.3: SIGNIFICANT IMPACT ASSESSMENT - KOALA

SIGNIFICANT IMPACT CRITERIA	ASSESSMENT AGAINST SIGNIFICANT IMPACT CRITERIA
	In addition the analysis of Koala Tree utility (primary vs secondary browse species), there was a significantly higher proportion of "primary" tree species such as *Eucalyptus tereticornis* and *E. propinqua* within the conservation area than was recorded in the proposed development area. Overall, the Koala Habitat Value Plot surveys show that the relative quality of koala habitat in the development footprint is lower than that recorded in the proposed vegetation retention areas. This is shown by both the higher density of NJKHTs and higher utility trees within the proposed retention areas relative to the development footprint. The above-summarised koala scat (activity assessment) surveys also found a lower rate of koala activity within the development footprint than that recorded within the proposed vegetation retention areas. This data was also reviewed in accordance with the Locally Important Koala Trees (LIKT) in the koala management bioregions as detailed in the document A review of koala habitat assessment criteria and methods (ANU, 2021). The review of the data for LIKT and Ancillary Trees showed similar trends to the comparison of NJKHTs and higher utility trees within the conservation area relative to the development footprint. The data shows that the conservation area supports both a higher representation of LIKT trees per plot (double) and a higher proportion of LIKT trees to Ancillary trees. As such, the measures of Koala habitat value and utilisation i.e. KSATs, the number of NJKHTs recorded; relative abundance of high Koala utility species and, LIKT trees to Ancillary trees all demonstrate that the KHA habitat values are higher within the conservation area than was recorded in the proposed development area. While the habitat within the proposed development is defined as critical habitat, the loss of this could be considered as posing a low potential for significant impact under this criterion. In addition, when the proposed clearing is considered in conjunction with the approved management measures that have been conditioned by the Qld State government, including the Rehabilitation Plan, Clearing Extents Plan and the Koala Management Plan, there is a likelihood that remaining habitats will be improved over time through active planting, allowing regeneration and succession and, Koala habitats would not be subject to increased threats such as weed invasion. As such the while the clearing will adversely affect the habitat defined as critical, loss of a small area of low-quality habitat when considered in conjunction with conditioned management measures the action is considered as having a low potential for significant impact. The residual impacts would also be negligible as the Qld government requires an offset which will be delivered by the active planting and management of Koala food trees at a secured offset site, that will provide greater than 5187 trees to compensate for the loss of 1729 NJKTs on site and will be approximately 15.6 ha in area. **The action will adversely affect habitat critical to the survival of a species, however given the low quality, retention of higher quality habitats subject to active management and the provision of an offset the residual impacts are considered negligible.**
Disrupt the breeding cycle of a population	The ecological surveys, including spotlighting and Koala faecal search surveys did not detect any definitive or anecdotal indications that site was used by breeding females, such as females with joeys indicated by two sizes of scats (large and small) detected at the same browse tree nor, were any signs of "pap" observed. The faecal search surveys results (KSATS) within the development footprint were more indicative of transient individuals based on, low activity levels and low numbers of scats detected indicating low residence times within browse trees. As such the habitats proposed for removal within the proposed development footprint, based on these results, are unlikely to form part of an important breeding habitat within a regular home range for breeding females. Whilst the studies could not assess the use of the site for Koala movement between breeding areas or for dispersal purposes, the proposed development has been designed to be "porous" for the Koala allowing and, encouraging movement through the final development with koala feed trees used in landscaping, complementing the significant corridor values retained and enhanced in the conservation areas on the balance site. The nature of the proposed activity including the retention and active management of the conservation area, the removal of threatening processes such as dogs, the assisted regeneration of the conservation area and active planting of landscape treatments should, increase the quality of habitats in the site area, compensating the spatial loss of lower quality habitats. As such, it is anticipated that rehabilitation works will support the improvement in habitat quality through encouraging higher densities and facilitating succession to maturity of preferred koala feed trees within the conservation area will provide habitats that support or supplement important breeding habitats. **The action is not considered likely to disrupt the breeding cycle of a population.**
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,	The site is known to provide habitats used by the Koala for foraging, shelter, movement and potentially, breeding and dispersal purposes. As previously detailed, the proposed activity will result in the loss or modification of 5.22 ha of the habitat demonstrating low koala usage (activity levels), with lower numbers of NJKHTs recorded; lower relative abundance of high Koala utility species and, lower abundance of LIKT trees to Ancillary trees in the proposed development than the proposed on-site conservation area. It is noted that the site's habitats, including the conservation area are degraded, subject to high levels of weed intrusion, ongoing impacts such as collection of firewood and rubbish dumping, and the entire area is bisected by many tracks which provide significant areas that can be rehabilitated. When considering the high level of disturbance within the proposed clearing area, the low recorded utilisation of koala, the koala-sensitive design measures incorporated into the development including use of koala feed trees in landscaping and the suite of management measures contained in the approved management plans, the loss of a small area of lower quality habitat is considered extremely unlikely to impact of the local koala population to the extent that it would decline. **It is therefore considered that the proposed activity would not pose the potential for significant impact on the Koala based on this criterion.**
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the	Invasive species that are currently known to be harmful to Koalas or Koala habitat include: » feral predators that attack Koalas (including Joeys) such as Feral dogs, Foxes and Cats and; » invasive plant species that: » degrade habitats through competition to regenerating browse and shelter trees,

TABLE 6.3: SIGNIFICANT IMPACT ASSESSMENT - KOALA

SIGNIFICANT IMPACT CRITERIA	ASSESSMENT AGAINST SIGNIFICANT IMPACT CRITERIA
endangered or critically endangered species' habitat	» create barriers to movement or access to trees (i.e. Guinea Grass or Lantana) » change fire regimes or fire impacts such as Gamba Grass. The proposed development area is currently subject to feral predator intrusion which is unabated. Further, the site contains significant areas of invasive weed species such as Giant Guinea Grass that are restricting Koala tree regeneration and create significant barriers to movement. The proposed activity does not directly include the introduction of any species that is known to be harmful to Koalas or Koala habitat. Notwithstanding the residents will be allowed to have pets or assistance animals but, as conditioned by the development approval, the Koala Management Plan requires that all pets must be approved by the body corporate/management which will restrict the breed of the pet. In addition, no pets are allowed off-leash except in a designated dog area with Koala exclusion fencing. The activity will also actively manage invasive weed species as part of the approved plans that form the approval conditions. Specifically, infestations of Guinea grass will be subject to active management and weed monitoring will occur throughout the conservation area and all new occurrences of weed species will be actively treated. The community-title model of management associated with the development provides a unique opportunity for a consolidated approach to ongoing compliance with approved rehabilitation and koala management plans. The action will therefore reduce the potential for invasive species that are harmful to the Koala becoming established in the site's habitats. **The action will therefore not be likely to result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.**
Introduce disease that may cause the species to decline, or	There are two major diseases that are thought to be impacting Koalas - Chlamydia (*Chlamydia pecorum*) and Koala Retrovirus (KoRV). Studies show that both have likely been with Koalas for thousands of years. KoRV may have been impacting Koalas prior to European arrivals in Australia. At present there are no other identified pathogens that present a risk to Koalas. The proposed action does not include any actions that represent a biosecurity threat to the Koalas or any species that may affect their habitat. **The action will therefore not be likely to introduce disease/pathogen that may cause the species to decline.**
Interfere with the recovery of the species.	In considering whether an activity will interfere with the recovery of the species an assessment must be undertaken of the impacts in terms of loss or increase in habitat values and the introduction or exacerbation of threats that may impact on the recovery of the local and regional population and, whether the action is consistent with the National Recovery Plan for the Koala *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory) (the listed Koala) (The Recovery Plan). The Recovery Plan identifies that prior to the introduction of amendments to the Koala conservation planning framework in 2020 in Queensland, "an independent review determined that the decline in peri-urban Koala populations in the Koala Coast and Pine Rivers areas of South East Queensland showed no evidence of slowing, and may even be increasing (Rhodes et al. 2015). These declines were linked to ongoing habitat loss in South East Queensland resulting from increasing urbanisation as well as other threats, such as dog attacks, disease and road mortality associated with development" The introduction of amendments to the Koala conservation planning framework in 2020 has resulted in the strongest Koala habitat protections Queensland has ever seen. This framework provides increased protection for Koala habitat in South East Queensland by increasing both the size and level of protections for Koala habitat areas compared with the state's previous regulatory framework. Koala habitat areas (including both core Koala habitat areas (KHA) and locally refined Koala habitat areas (LRKHA)) now cover 714,040 ha of land across South East Queensland. Of this, 332,278 ha, including 10,012 ha within the South East Queensland Urban Footprint, falls within Koala priority areas in which the clearing of Koala habitat areas is prohibited by the Queensland Government, subject to certain exemptions. These exemptions balance protecting Koala habitat with the need to allow clearing for limited development such as essential services. The proposed activity through its design and approved management measures will limit impacts to a small area of low-quality habitat where, as detailed in the KSAT results, only demonstrated the use of 4 koala trees from 90 trees searched in the development footprint during 2020. The design also reduces the potential for threatening processes as a result of the development through adoption of koala-sensitive design including the use of koala exclusion fences where conflicts occur and koala-friendly fencing securing habitats – such as the conservation area, the development having low-speed internal roads and even increased lighting along Church Street to avoid road conflicts and the regulation of dogs within the development. The management measures such as assisted and active revegetation and weed management to be applied to the conservation area (as well as koala refuge tree landscape planting treatments) will also ensure a safe refuge for foraging, shelter, breeding dispersal and movement to other habitats in the locality by alleviating the current threats and improving koala habitat such as; » altered fire regimes as a result of weed species such as Giant Guinea grass, » allow for free and unhindered koala movement by reduction of invasive species reducing impacts to energetics and stress of feral animal and thereby potentially reduce susceptibility to Chlamydia as a result of external stressors; » allow for the regeneration of LIKT tree species in currently cleared areas such as tracks and ensure assisted natural successional processes to be unhindered. As such, the activity when assessed in the context of the combination of design and management measures that form the entire activity for the assessment will not interfere with the recovery of the local or regional population of Koalas. The Recovery Plan also states that *"The South East Queensland Koala Conservation Strategy 2020–2025 (DES 2020a) represents a relatively successful planning approach, undertaken in consultation with interest groups, at a bioregional scale that is fit for purpose and is a bespoke response to the issues affecting the management of Koalas in South East Queensland".*

TABLE 6.3: SIGNIFICANT IMPACT ASSESSMENT - KOALA

SIGNIFICANT IMPACT CRITERIA	ASSESSMENT AGAINST SIGNIFICANT IMPACT CRITERIA
	As the proposed development has been approved by the State in accordance with the South East Queensland Koala Conservation Strategy 2020–2025 (DES 2020a) and the National recovery plan acknowledges that the bespoke management and regulation provided by strategy aligns with the Recovery Plan – it is considered that the proposed activity largely meets the requirements of The Recovery Plan. **The activity is considered unlikely to interfere with the recovery of the species.**

6.4 Significant Impact Assessment - Vulnerable species

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

Conservation Status

The Grey-headed Flying-fox is listed as 'Vulnerable' under the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act). In effect under the EPBC Act from 06-Dec-2001.

Occurrence and Habitat

The Grey Headed Flying fox is a single, extremely mobile, interbreeding population distributed over a vast area from Bundaberg in Queensland to Geelong in Victoria, with some isolated camps and rare sightings outside this range. During the last 100 years the extent of the species has reduced up to 500 km due, speculatively to the southward movement of the Black-flying Fox (*Pteropus alecto*).

The Grey-headed Flying-fox (*Pteropus poliocephalus*) occurs in a range of habitats including subtropical and temperate rainforests, dry and wet sclerophyll forests, Banksia woodland, heaths and Melaleuca swamps (Duncan et al, 1999; NPWS, 2001). The Grey-headed Flying-fox is a frugivorous and nectivorous species that feeds upon a variety of flowering and fruiting plants, feeding upon the blossoms of eucalypts, angophoras, tea-trees, and banksias, and rainforest species, especially *Ficus spp*. (DAWE 2021, National Recovery Plan for the Grey-headed Flying-fox '*Pteropus poliocephalus'*, Department of Agriculture, Water and the Environment). This species may travel hundreds of kilometres in response to food availability and may often feed upon orchids and trees in urban gardens (NPWS, 2001). Major food plants include the fruit and blossom of and blossoms of myrtaceous species such as *Eucalyptus*, *Corymbia* and *Angophora*, melaleucas, banksias (Eby and Law 2008) and the fruit and flowers of *Syzygium spp*. (Roberts 2006, Eby 1991).

The Grey-headed Flying-fox roosts in large colonies of up to tens of thousands, often known as 'camps'. The camps are generally located within 20 km of a regular food source, and often situated in the exposed branches of emergent tree within riparian rainforest, mangroves, and a variety of sclerophyll forest types including Paperbark and Casuarina Forests (Duncan et al, 1999; NPWS, 2001). These colonies are also known to occur in urban parks and gardens Patterns of occupancy and relative abundance within its distribution vary widely seasonally and temporally. When assessed at a local scale, the species is generally present intermittently and irregularly (Eby and Lunney 2002).

Patterns of camp occupation vary, ranging from sites that are inhabited continuously to those that are inhabited only rarely (Parry-Jones 1993, Eby 1995). Although many camps have distinguishable seasonal patterns of occupation, annual variations can be extreme and peak population size can exceed 50 000 (Parry-Jones and Augee 1992, Parry-Jones 1993, Eby et al. 1999, Birt 2000).

In March 2024 the CSIROs review of population data, show the population has been relatively stable since 2012, when surveys first began under the National Flying-fox Monitoring Program.

Known Camp in the locality

A review of the Ipswich Council Flying Fox webpage and the National Flying-fox Monitoring Program via the Flying-fox interactive web tool interactive was interrogated for information on the location of and usage of both local and Nationally Important Flying fox Camps. The Local camps identified within the local area included;

- Langley Road, Camira which is approximately 2km south-west of the site
- Pilny Reserve, Camira situated approximately 2.2km SW of the site

- Stephen Cook Memorial Park, Camira situated approximately 3.5km SW of the site
- Pan Pacific Peace Gardens, Redbank, situated approximately 2.5km NW of the site
- Philip Street, Redbank Plains greater than 4km southwest of the site

The Langley Road roost during the last monitoring survey only reported Black Flying -foxes at this location. An additional local roost at Woogaroo Creek Goodna, near Wolston Park Golf Club was shown on the interactive viewer however the most recent survey conducted for the National Flying-fox Monitoring Program determined that the roost was not in use at the time.

The closest Nationally Important Flying-fox Camps were determined to occur at;

- Lilac Street Inala, approximately 7 km North- east of the site with between 2,500 and 9,999 Grey-headed flying foxes estimated during surveys in 2021 and,
- Westlake Drive, Mount Ommaney approximately 9 km North, north- east of the site with numbers of Grey-headed flying foxes estimated at between 500 -2500 most years since 2013 and between 16000-49,999 of these species estimated in 2019.

The study area contains foraging habitat for the Grey-headed Flying-fox and there are numerous records of this species within the locality (NPWS, 2005). In addition, the Swamp Forest and Casuarina Forest adjoining the site to the north and west respectively may support a Flying-fox camp, however there are no records of these areas being utilised by roosting colonies.

Occurrence in the Subject Area

The Grey-headed Flying-fox (*Pteropus poliocephalus*) was not recorded on the site despite specific spotlighting surveys undertaken for the species. However, based on habitats present and the species habitat preferences, records in the area, the species was considered as Likely to Occur in the Likelihood of Occurrence assessment and is considered a Subject Species for the proposed activity. **TABLE 6.3** presents a review of project impacts on grey-headed flying fox against the Significant Impact Guidelines (EPBC Act Policy Statement 1.1).

TABLE 6.4: SIGNIFICANT IMPACT ASSESSMENT – GREY-HEADED FLYING FOX

SIGNIFICANT IMPACT CRITERIA	ASSESSMENT AGAINST SIGNIFICANT IMPACT CRITERIA
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of an important population of a species,	The Grey Headed Flying fox is a single, interbreeding population from Bundaberg in Queensland to Geelong in Victoria. While this range has contracted in the last 100 years the species numbers and distribution has recently been stated as stable for the last 10 years. Due to the species mobility and this interbreeding across its range, the Grey Headed Flying fox **is not an important population** in SE Qld, or any other area of its known range. The amount of habitat to be cleared is up to 5.22 ha however, the proposed development will retain 6.02 ha in a conservation area that will be subject to approved Management plans for the development including a Rehabilitation Management Plan. The impact area final development will incorporate native tree species that are known to provide nectar resources for the species and therefore in combination the management including active planting of the conservation area the residual loss of nectar resources will be reduced over time. The area of habitat proposed to be cleared is considered negligible in the context of the similar and associated vegetation communities that support foraging resources within the Goodna-Springfield –Greenbank area and as such, would not significantly reduce the area of nectar resources available in the area to the extent that it lead to any decrease in the population. **The proposed activity is therefore unlikely to lead to a long-term decrease in the size of the population and a result of the action.**
Reduce the area of occupancy of an important population,	The Grey Headed Flying fox is a single, interbreeding population from Bundaberg in Queensland to Geelong in Victoria. While this range has contracted in the last 100 years the species numbers and distribution has recently been stated as stable for the last 10 years. Due to the species mobility and this interbreeding across its range, the Grey Headed Flying fox is not considered as an important population in SE Qld, or any other area of its known range. Due to the species mobility and interbreeding across its range, the Grey Headed Flying fox is not considered as an important population in SE Qld, or any other area of its known range. As the area of occupancy is assessed using 2 x 2 km grid cells (200 ha) as per IUCN criteria, the clearing of less than half of the site (5.22 ha) for the proposed action, and as the study area does not occur near the edge of the species distribution, the proposed activity could not be considered as reducing the area of occupancy in a regional context. In a local context, the proposed removal of less than 45% of the appropriate habitat from the site and retention of higher quality habitats in the conservation area the proposed activity would only result in the loss of a small area of foraging habitat and not impact on the dispersal ability of the species in the locality. **The proposed activity will not reduce the area of occupancy of an important population,**
Fragment an existing important population into two or more populations,	The Grey headed flying fox is extremely mobile often recorded travelling 10.9 km from the roost to forage (average based on telemetry), and up to 40km from the roost in a night. Within this flight distance the Grey-headed Flying-fox utilises fragmented areas of habitat. The Grey-headed flying fox also migrate in response to food availability and are known to travel on occasions hundreds of kilometres. The removal of 5.22 ha of foraging habitat occurring within the study area will not become isolated as a result of the proposal.

TABLE 6.4: SIGNIFICANT IMPACT ASSESSMENT – GREY-HEADED FLYING FOX

SIGNIFICANT IMPACT CRITERIA	ASSESSMENT AGAINST SIGNIFICANT IMPACT CRITERIA
	As such, the proposed activity will not fragment an existing population into two or more populations and therefore would not pose the potential for a significant impact on the Grey-headed Flying-fox under this assessment criteria.
Adversely affect habitat critical to the survival of a species,	Habitat critical to the survival of Grey-headed Flying-is identified in the National Recovery Plan for the Grey-headed Flying-fox (Pteropus poliocephalus (DAWE 2021) ("The Recovery Plan") are vegetation communities that contain important winter and spring flowering species including; *Eucalyptus tereticornis, E. albens, E. crebra, E. fibrosa, E. melliodora, E. paniculata, E. pilularis, E. robusta, E. seeana, E. sideroxylon, E. siderophloia, Banksia integrifolia, Castanospermum australe, Corymbia citriodora citriodora, C. eximia, C. maculata, Grevillea robusta, Melaleuca quinquenervia* or *Syncarpia glomulifera.* » *"Habitat critical to the survival of the Grey-headed Flying-fox may also be vegetation communities not containing the above tree species but which:* » *contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May)* » *contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the Department's interactive flying-foxweb viewer, or* » *contain native and or exotic species used for roosting at the site of a nationally important Grey-Headed Flying-Fox camp1 as identified on the Department's interactive flying-fox web viewer"* The study are supports Open forest analogous to Remnant Regional Ecosystem 12.9-10-2 which contains a number of these winter flowering species as overstorey dominant /co dominant species including but not limited to *Corymbia citriodora, E. crebra, E. tereticornis*, *E. major/paniculata* and *E. siderophloia*. In addition, two Nationally Important Flying-fox Camps occur within 20km of the study area. As such, the study area supports habitat critical to the survival of Grey-headed Flying as defined by the Recovery Plan. As Regional Ecosystem 12.9-10-2 is widespread in the South east QLD bioregion and is estimated to have an extant area of 86000 ha (2021) (Accad, Aet.al.2024) the loss of 5.22ha is less than 0.006% of the extent of this vegetation type in Qld. Locally, this Regional ecosystem is well represented in conserved with large areas in Goodna, Greenbank and Springfield areas which are in closer proximity to the nationally important camps. The analysis of the of the Non-Juvenile Koala Habitat Trees data collected from field surveys (and Locally Important Koala Trees) which includes these winter and spring flowering species, demonstrates that the proposed clearing area is lower quality, supporting lower densities of mature trees and less trees (above 10cm dbh) than the retained conservation area. In addition, the Rehabilitation Plan and Koala Management plan as approved under state legislation, will result in the active planting of Winter flowering species within the landscaping and conservation areas providing for future nectar resources for the species. While the proposed activity will result in a reduction of a vegetation community containing Habitat critical for the species, the residual impact of 5.22 ha of habitat loss has been minimised as far as practicable and is limited to areas with younger trees that currently provide limited nectivorous resources for the species. As such the loss of this small area of habitat is highly unlikely to affect the survival of the species. **The proposed activity will adversely affect habitat critical to the survival of a species.**
Disrupt the breeding cycle of an important population,	The proposed activity does not occur within close proximity to any known Grey-headed Flying-fox local or nationally important camps that occur in the region, with, Four (4) local camps occurring between 2 and 4km from the site and, two (2) Nationally Important Flying-fox Camps occurring 7 km and 9 km North to North -north- east of the site respectively. The largest of these is at Westlake Drive, Mount Ommaney approximately 9 km North, north- east of the site with numbers of Grey-headed flying foxes estimated at between 500 -2500 most years since 2013 and between 16000-49,999 of these species estimated in 2019. The direct impacts associated with the activity will therefore not occur near any species breeding habitat for the species and due to the distance of the proposed activity from known camps, no indirect impacts such as noise, light or other human disturbance will affect the breeding cycle. **The action could not be considered as posing a potential to disrupt the breeding cycle of a population.**
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 activity will result in the removal of 5.22 ha of potential foraging habitat As Regional Ecosystem 12.9-10-2 is widespread in the South east QLD bioregion and is estimated to have an extant area of 86000 ha (2021) (Accad, Aet.al.2024) the loss of 5.22ha is less than 0.006% of the extent of this vegetation type in Qld. Locally, this Regional ecosystem is well represented in with large areas in Goodna, Greenbank and Springfield areas which are in closer proximity to the nationally important camps. **The action could not be considered as posing a potential to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.**
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed action does not involve the use of, or introduction of any species (agricultural or landscaping) that could pose a risk of becoming invasive. The approved management plans also require that existing invasive weed species such as Guinea Grass and Lantana species are actively managed and will reduce the impact of these on the species which are currently degrading the habitats of the site and causing a hindrance to the natural regeneration. **The proposed action is not considered to pose a risk that will result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**
Introduce disease that may cause the species to decline, or	The proposed action does not involve the use of, or introduction of any species (agricultural or landscaping) that could pose of introduction of a pathogen that could impact on the Grey-headed Flying-fox **The action will therefore not be likely to introduce disease/pathogen that may cause the species to decline.**

TABLE 6.4: SIGNIFICANT IMPACT ASSESSMENT – GREY-HEADED FLYING FOX

SIGNIFICANT IMPACT CRITERIA	ASSESSMENT AGAINST SIGNIFICANT IMPACT CRITERIA
Interfere with the recovery of the species.	The nature of the proposed activity including the retention and active management of, and the and assisted regeneration of the conservation area and, active planting of landscape treatments should, increase the quality of habitats in the site area, compensating the spatial loss of lower quality habitats. As such, it is anticipated that rehabilitation works will support the improvement in habitat quality through encouraging higher tree densities and facilitating succession to maturity of important winter feed trees within the conservation area. **The action will therefore not Interfere with the recovery of the species**

Chapter 7: Conclusion

7.1 Conclusions

This Ecology Assessment Report has been prepared based on ecological surveys to detail the existing ecological values of the site and to assess the potential impacts of future development within the site. The conclusions of this report are essentially a summary of the desktop-based environmental planning review and results of field survey conducted during 2020, 2021 and are supplemented by recent surveys conducted in 2024.

The ecological studies and assessments determined that:

- The site is generally in moderate ecological condition supporting a disturbed Open forest Community dominated by *Eucalyptus mollucana* and *Corymbia citriodora* with *E. crebra, Angophora leiocarpa, E. major and E. siderophloia. E. tereticornis* and *Lophostemon suaveolens* are also represented in gullies. The Shrub layer is dominated by *Acacia spp., Alphitonia excelsa, L. suaveolens* and occasional *Allocasuarina littoralis*. This community was found to be analogous with Least Concern Remnant Regional Ecosystem 12.9-10-2
- The site contains two ephemeral drainage corridors which are highly disturbed and contain high densities of the Guinea Grass.
- The site was also identified as contributing to local fauna movement conduits.
- No Locally Significant fauna species were recorded on site despite targeted surveys.
- Twelve potential fauna breeding habitat resources were recorded on site. The proposed development allows for the retention of six (6) of these and would result in the removal of only three (3) hollow bearing trees.
- The site has low to high levels of weed incursion, including scheduled weeds under the Biosecurity Act 2014.
- The site is known to contain known habitat for the Koala listed Endangered pursuant to the EPBC act and the NC Act and, the site was considered likely to support habitat for the Grey Headed Flying Fox listed as Vulnerable pursuant to the EPBC act

The Assessment of significant impact determined that the proposed activity is likely to result in a significant impact on both the Koala and Grey-headed Flying Fox as the proposed development requires clearing and modification of 5.22 ha which is deemed as habitat critical to the survival of both species.

Notwithstanding, the proposed activity has incorporated a suite of design considerations including the retention and active management of a conservation area of 6.02 ha (~55% of the site) which retains higher quality habitats and maintains corridor function across the site.

The development has also been approved by the Qld state government (SARA) and Ipswich City Council on the basis of a suite of mitigation measures detailed in the site specific management plans including the;

- Vegetation Clearing Extents Plan, prepared by New Ground, dated 8 March 2022,
- Koala Management Plan, prepared by New Ground, dated 9 October 2021, and
- Conceptual Rehabilitation Plan Lot 372 SP104177, prepared by New Ground, dated 9 October 2021

In addition, the conditions require that the proponent deliver an environmental offset in accordance with the Environmental Offsets Act 2014 to counterbalance the residual impacts on the matters of state environmental significance being clearing of 1,729 non-juvenile koala habitat trees.

The client is currently in advanced discussions to secure an appropriate offset site in the Minjehla Dhagun Conservation area under the jurisdiction of the board of Yugambah Land Enterprises. This offset area will be subject to revegetation including the planting and management of Koala fed trees at a ratio of three times the removed NJKTs, totalling at least 5187 koala food tree species over an area of greater than15.6ha.

With consideration of the management measures and other conditions of consent, including the requirement for offsets, it is considered that the proposed action is unlikely to result in the potential for residual impact on either the Koala or Grey-headed Flying Fox.

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