Biodiversity AUSTRALIA

SUSTAINABLE PARTNERSHIPS
DEDICATED TO ACHIEVING
ECOLOGICAL AND ECONOMICAL BALANCE

LEADING THE WAY
IN ENVIRONMENTAL
MANAGEMENT

WILLOWTREE WMF EXPANSION

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT MERRIWA ROAD WILLOW TREE

October 2022

Contents

List of Tables

List of Figures

List of Photos

Document Control Page

Version Control

Version	Purpose	Author	Reviewed / approved by	Date
Rev 1.0	Draft Report	Daniel Joyce	Karl Robertson	13/10/2022
Rev 2.0	Final		Lachlan Webster	2/12/2022

Distribution Control

Copy	Purpose	Method	Issued to:	Name	Date
1	File Copy	Electronic/Email	Biodiversity Australia	Chantal Sargeant	2/12/2022
2	Client Review	Electronic/Email	GHD	Shaun Lawler	2/12/2022

Project Number: ENS5225

Our Document Reference: ENS5225-BEC-REP-WillowtreeWMF EX EA-rev2.0

1. Executive Summary

This report has assessed the impact in relation to a proposed extension to an existing Waste Facility at Willow Tree, NSW. The proposed Development Footprint has been designed to minimise impact on the native vegetation of the Subject Land. The total area of impact is 0.05 ha.

No threatened flora or fauna species were recorded during the survey. However the vegetation on site does qualify as White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Grassland TEC. A number of threatened species were deemed to have a moderate to fair chance of occurring on the Subject Land. However, given only 0.05 ha of native vegetation is proposed to be cleared it is unlikely that the proposed development will have a significant impact on these species.

Although a significant impact to the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is not expected due to the minute area of impact. Under the precautionary principle a 0.3 ha rehabilitation area has been proposed to offset the proposed clearing. The proposed ameliorative measures that the rehabilitation area would have will, over time, improve the quality and extent of the TEC. It will also improve resources and habitat available on the subject land for any threatened fauna that may occur.

The Development does conform to potential Koala Habitat under the *State Environmental Planning policy (Biodiversity and Conservation) 2021*. However, the minute impact area of the proposed development will not reduce the available habitat on the subject land to an extent that would impact negatively on the species.

The Subject Site does not include Coastal Wetlands or Littoral Rainforest pursuant to the Resilience and Hazards SEPP.

The Subject Site is not deemed to have a negative impact on any other areas of significant biodiversity value.

Consequently, the proposal is not considered to require a Biodiversity Development Assessment Report, or referral to the DCCEEW for approval under the EPBC Act.

2. Abbreviations

Table 1: List of abbreviations used within the report

APZ	Asset Protection Zone
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act*
BDAR	Biodiversity Development Assessment Report
CBD	Central Business District
DA	Development Application
DBH	Diameter at Breast Height
DCP	Development Control Plan
DEC	Department of Environment and Conservation
DEE	Department of Environment and Energy
EEC	Endangered Ecological Community
EPBC Act	*Environment Protection and Biodiversity Conservation Act*
HBT	Hollow-bearing Tree
KFT	Koala Food Tree
KPoM	Koala Plan of Management
KTP	Key Threatening Process
LEP	Local Environment Plan
LGA	Local Government Area
MNES	Matter of National Environmental Significance
NSW	New South Wales
OEH	Office of Environment and Heritage
PCT	Plant Community Type
PIR	Passive Infrared Camera
SAT	Spot Assessment Technique
SEPP 44	*State Environmental Protection Policy No. 44*
TEC	Threatened Ecological Community
VMP	Vegetation Management Plan

3. Background Information

3.1 Location of the Study Site and Key Definitions

The Subject Land is currently zoned SP1 Special Purpose and is currently operating as a Waste Management Facility (WMF). Historically the Subject Land was operated as a quarry. The location of the Subject Land is on Merriwa Road, Willow Tree, NSW, approximately 1.8km south west of Willow Tree town centre (Figure 1). The current land use is predominantly associated with the existing waste management facility and adjacent quarry with excavated areas devoid of vegetation present across the majority of the Development Footprint. The site also consists of partially cleared grassland and vegetated areas in the southern portion with relatively intact flora communities.

The Subject Land is defined as Lot 213 DP1173230 and other associated road easements and comprises 16.9 ha located on Merriwa Road, Willow Tree (Figure 2) The study area is land within 100 metres of the Subject Land. The locality is land within a 10 km radius of the Development Footprint. The Development Footprint is defined as the area of land directly affected by the proposed development and covers an area of 3.91 hectares, consisting of the proposed waste facility infrastructure and associated access roads and weigh bridge.

3.2 Development Proposal

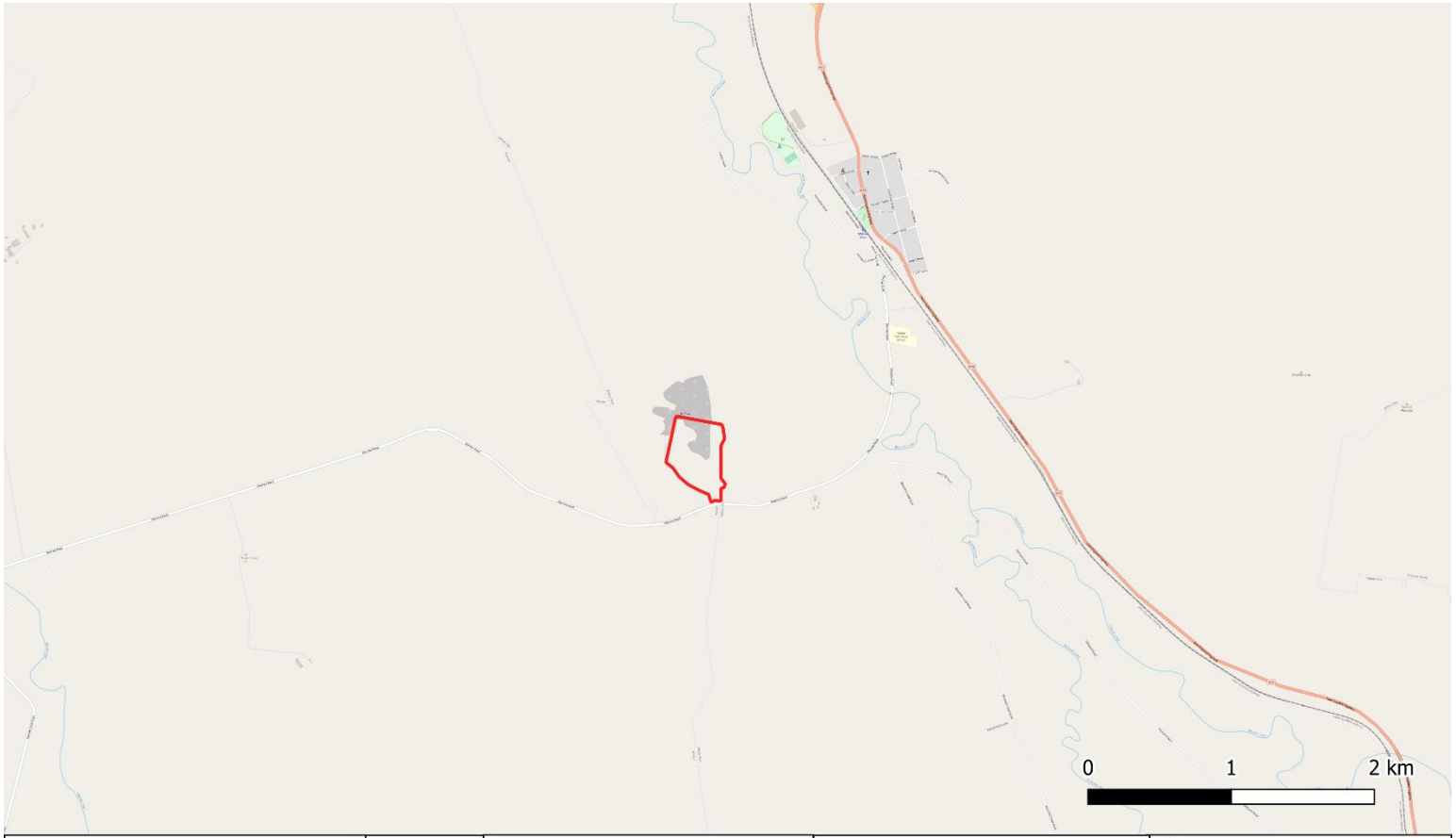
The proposed development requests the extension of an existing Waste Management Facility and associated amenities consisting of:

- Weigh Bridge
- Access road
- Small vehicle transfer station
- Resource recovery area

3.3 Soils, Topography and Geology

The Subject Land is mapped as containing Triassic sedimentary rocks consisting of Lithology; Quartz-lithic to quartz-rich sandstone with conglomerate, mudstone and siltstone. Deposited in high energy braided river systems. (SEED Data Base -Department of Regional NSW – 15,000 Simplified Surface Geology mapping 2009). The site also contains alluvial deposits associated with local water courses.

Figure 1: Location of the subject land



This mapping is to be considered indicative only and all derivations (eg of areas of EECs and vegetation communities) are at best approximations and subject to errors including individual interpretation and reliance on information provided to Biodiversity Australia where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping, ect. should be placed upon this map without independent validation of the information by the user.Biodiversity Australia takes no responsibility for any sudsequent error losses etc. that may arise from use of this data without independent verification.	Project Manager: KR Drawn By: LW Date: 13 May 2022 Map Projection: MGA Zone 56 Datum: GDA1994	Figure Name: Location of Development Site Site: Willow Tree WMF Expansion Client: GHD	**Legend** Development Site N	Biodiversity AUSTRALIA QGIS Job Number: ENS5225 Scale: 1:40000 Page: 1 of 1 Veriation A

Figure 2: Proposed development layout

This mapping is to be considered indicative only and all derivations (eg of areas of EECs and vegetation communities) are at best approximations and subject to errors including individual interpretation and reliance on information provided to Biodiversity Australia where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping, ect. should be placed upon this map without independent validation of the information by the user. Biodiversity Australia takes no responsibility for any sudsequent error losses etc. that may arise from use of this data without independent verification.

Biodiversity AUSTRALIA

QGIS

Project Manager: KR	
Drawn By: LW	
Date: December 2022	
Map Projection: MGA Zone 56	
Datum: GDA2020	
Page: 1 of 1	

Legend
- Development Footprint
- Subject Land
- RoadSegment

N

Figure Name: Proposed Development Layout

Site: Willowtree WMF

Client: GHD

Scale:	Job Number:	Veriation:
1:2000	ENS5225	B

Figure 3: NSW geology

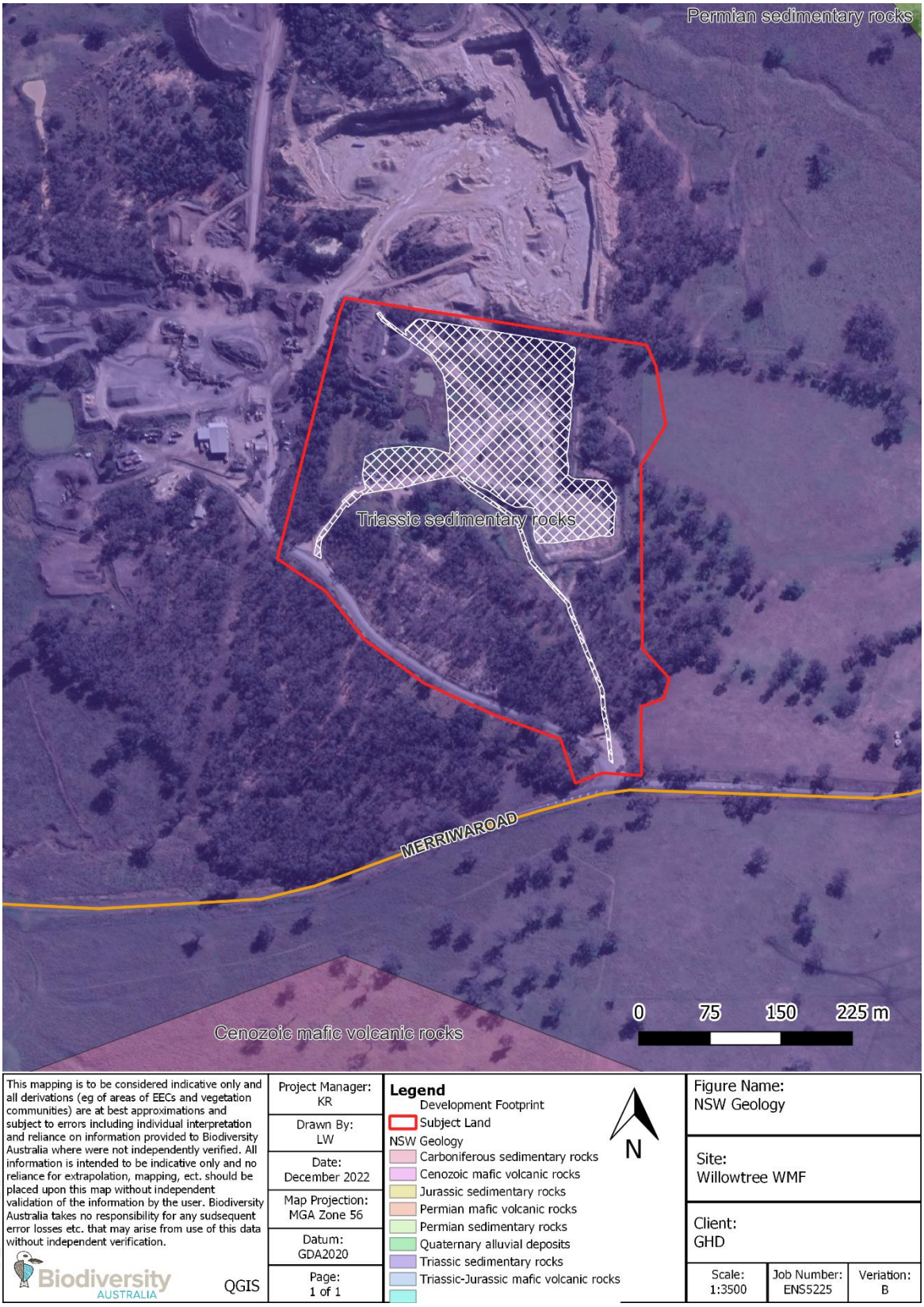


Figure 4: Subject Land photo locations

This mapping is to be considered indicative only and all derivations (eg of areas of EECs and vegetation communities) are at best approximations and subject to errors including individual interpretation and reliance on information provided to Biodiversity Australia where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping, ect. should be placed upon this map without independent validation of the information by the user. Biodiversity Australia takes no responsibility for any sudsequent error losses etc. that may arise from use of this data without independent verification.

Biodiversity AUSTRALIA

QGIS

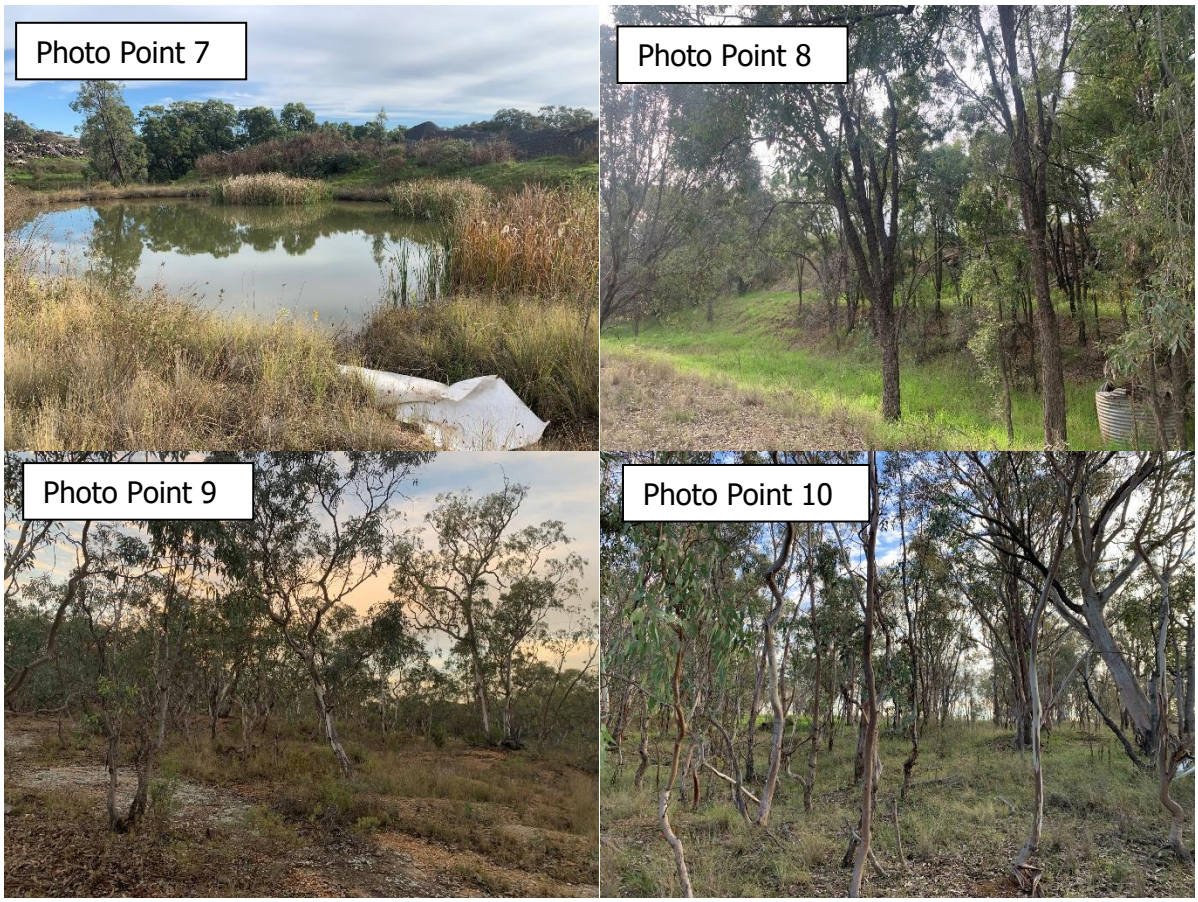
Project Manager: KR	
Drawn By: LW	
Date: December 2022	
Map Projection: MGA Zone 56	
Datum: GDA2020	
Page: 1 of 1	

Legend
- Development Footprint
- Subject Land
- Photo Point

N

Figure Name: Subject Land Photo Locations		
Site: Willowtree WMF		
Client: GHD		
Scale: 1:2000	Job Number: ENS5225	Veriation: B

Photo 1: Site Photos



4. Methods

4.1 Desktop Study and Literature Review

A desktop study was carried out prior to the field survey to gather relevant information and data. The following databases and Geographic Information System (GIS) layers were searched/obtained:

- Department of Climate Change, Energy, the Environment and Water Protected Matters Search Tool (DCCEEW 2022a).
- Department of Climate Change, Energy, the Environment and Water Protected MNES SPRAT Profiles (DCCEEW 2022b).
- Office of Environment and Heritage Threatened Biodiversity Data Collection (OEH 2022).
- NSW Department of Planning, Industry and Environment - BioNet/Atlas of Wildlife (DPIE 2022a).
- NSW Department of Planning, Industry and Environment - Regional Corridors and Key Habitat Mapping (DPIE 2022b).
- NSW Department of Planning, Industry and Environment - Biodiversity Values Map and Threshold Tool and digital data layer (DPIE 2022c).
- Department of Regional NSW – 15,00 Simplified Surface Geology Mapping (2009)

4.2 Flora Survey

The flora survey consisted of three main components:

- Identification, description and mapping of the vegetation communities on the site;
- Searches for threatened species listed under the *Biodiversity Conservation Act 2016* (*BC Act*) *and Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) undertaken in accordance with the NSW Guide to Surveying Threatened Plants (DPE 2022); and
- Identification, mapping and condition assessment of any Endangered Ecological Communities listed under the *BC Act*, and *EPBC Act*.

4.2.1 Vegetation Classification and Mapping

Vegetation integrity survey plots were undertaken within the development footprint as per the BAM methodology. Each consists of a 20x20 metre plot in which floristic composition and structural attributes are collected, and a 20x50 metre plot which collects ecosystem function attributes.

The following information was collected within each vegetation plot:

- Observer, location and date;
- Plot dimensions and orientation;
- Photographic record of vegetation;
- Vegetation Class and Plant Community Type (PCT);
- Physical features and disturbance history;
- Full flora list;
- Growth-form cover and abundance of each species;
- Exotic and High Threat Exotic (HTE) plant cover;
- Number of large trees;
- Recruitment;
- Presence of hollow-bearing trees;
- Length of logs; and
- Litter cover.

Vegetation classifications were based on the NSW Plant Community Type (PCT) Classification. Identification of possible Threatened Ecological Communities (TECs) was based on the data collected in the survey and review of the relevant listings on the DPE website (www.environment.nsw.gov.au) and Department of Climate Change Environment Energy and Water (DCCEEW) – MNES SPRAT website (2022).

Plant species were identified to species or subspecies level and nomenclature conforms to that currently recognised by the Royal Botanic Gardens and follows Harden (1990, 2007) and PlantNET (Royal Botanic Gardens 2022) for changes since Harden.

4.2.2 Threatened Flora Species

4.2.2.1 Searches

A targeted survey for threatened flora species was undertaken over the Subject Land in May 2022 by accredited assessor Karl Robertson (BAAS21022) CVs is presented in (Appendix A-1). Bluegrass was the focus of these surveys however searches incorporated all possible threatened species.

The survey methodology consisted of field traverses as per the Surveying Threatened Plants and Their Habitats, NSW Survey guide for the Biodiversity Assessment Method 2020. This survey technique typically involves searches along a grid of parallel traverses within the Subject Land. The traverses are a set distance apart depending on the life form and type of vegetation and cover the entire extent of potential habitat for each target plant species. Due to the limited extent of vegetation on site, traverses were conducted along all vegetated areas and not in parallel traverses. This ensured that the full extent of the Subject Land was surveyed.

The Subject Land was traversed by one BAM Accredited accessor and one other Ecologist. Given the limited extent of vegetation in the Development Footprint, this level of targeted threatened flora effort allowed for 100% coverage of the Development Footprint. Areas of exotic grassland were given the least amount of effort whilst habitats which had potential to support the aforementioned threatened species were afforded higher effort.

Targeted threatened flora survey was undertake by ecologists - Karl Robertson (BAAS212022), Lachlan Webster among others. CVs are presented in Appendix A-1.

Opportunistic searches for threatened flora species were also undertaken during the vegetation plot surveys as well as during other activities on the Subject Land. Species identified during the survey are presented in Appendix A-2.

4.2.2.2 Potential Occurrence Assessment

A potential occurrence assessment of threatened flora species is provided in Appendix A-3. This assesses threatened species for their potential to occur on site.

4.3 Fauna Survey

The fauna survey was undertaken by a Principal Ecologist under Biodiversity Australia's scientific license and animal research authority. This was undertaken over one day on 19 May 2022. The methods per survey measure are detailed below.

4.3.1 Habitat Evaluation

The habitat evaluation was the principal survey method employed to assess the suitability of site habitats for threatened species recorded in the locality, or in broadly similar habitats in the region.

Habitats on and adjacent to the site were defined and assessed according to parameters such as:

- Structural and floristic characteristics of the vegetation;
- Degree and extent of disturbance;
- Presence of water in any form;
- Size and abundance of hollows and fallen timber;
- Availability of shelter e.g. rocks, logs, hollows, undergrowth;

- Wildlife corridors, refuges and proximate habitat types; and
- Presence of mistletoe, nectar, gum, seed and sap sources.

This information is considered for evaluation of the potential occurrence of threatened species on or adjacent to the site based on cited ecology and personal experience/knowledge of the species.

4.3.2 Secondary Evidence/Reptile Searches

Physical habitat searches involved lifting up of any timber, rocks and debris, and inspection of dense vegetation and leaf litter for frogs and reptiles; inspection of trees for Koalas and claw markings; binocular inspection of trees; searches for nests; and searches for scats, owl regurgitation pellets, tracks and scratches.

4.3.3 Diurnal Bird Survey

This involved passive surveys (e.g. listening for bird calls) and active observation/binocular searches while walking around the entire development site; and opportunistically during other activities.

4.3.4 Potential Occurrence Assessment

A Potential occurrence assessment of threatened fauna species is provided in Appendix A-3. This assesses threatened species for their potential to occur on site. Marine and estuarine species have not been considered as suitable habitat for these does not occur within the subject site.

4.4 Survey Timing and Limitations

The fauna survey period fell in early May, which is a period of lower activity for arboreal mammals, Microchiropteran bats, frogs and birds (DEC 2004). Longitudinal and latitudinal migrants such as the Swift Parrot may however be present at this time of year.

To counter any limitations, qualitative and quantitative habitat evaluations were used as well as a standard ecological field survey to assess the site's significance to threatened species. Habitat evaluations conservatively assesses the potential occurrence of threatened species based on potentially suitable habitat and local records, providing a prediction of the likelihood of a particular threatened species occurring in the study area (DEC 2004, DECC 2007). This approach is considered best practice to address the principle of uncertainty.

4.5 Weather Conditions

The weather over the 2 day survey period in 2022 was generally fine and sunny.

Minimum temperatures ranged from 3.7 degrees Celsius to 6.2 degrees Celsius with maximum temperatures of 14.8- 18.6 degrees Celsius. (BOM 2022 - nearest weather station at Murrurundi Gap AWS).

There were showers in the in the two weeks preceding the survey period.

5. Results

5.1 Desktop Search Results

5.1.1 Locally Recorded Threatened Species

The following table lists the threatened flora and fauna species identified in database and literature searches of the locality (10 km radius).

Table 2: Locally recorded threatened species

Common Name	Scientific Name	BC Act	EPBC Act	Source
Fauna				
Little Eagle	*Hieraaetus morphnoides*	V,P	-	Bionet
Masked Owl	*Tyto novaehollandiae*	V,P,3	-	Bionet
Koala	*Phascolarctos cinereus*	E1,P	E	Bionet

BC Act
3 Sensitivity Class 3 (Sensitive Species Data Policy)
E1 Endangered (Biodiversity Conservation Act 2016)
P Protected (National Parks & Wildlife Act 1974)
V Vulnerable (Biodiversity Conservation Act 2016)

EPBC Act
E Endangered (Commonwealth EPBC Act 1999)

5.1.2 Matters of National Environmental Significance

The results of the MNES search are provided in Section 9 with a total of 36 threatened species and twelve migratory species identified. The search was undertaken using a 10-kilometre search radius from the Subject Land. See Appendix A-6 for the full report.

5.1.2.1 Threatened Ecological Communities

A total of seventeen (17) Threatened Ecological Communities (TEC's) were identified during the desktop assessment. These communities detailed in Table 3, below.

Table 3: Threatened Ecological Communities

Description	BC Status	EPBC Status
Artesian Springs Ecological Community in the Great Artesian Basin	Critically Endangered	-
Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions	Endangered	-
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered	-
Howell Shrublands in the New England Tableland and Nandewar Bioregions	Endangered	-
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	Endangered	-
Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions	Endangered	-
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Endangered	-

Native Vegetation on Cracking Clay Soils of the Liverpool Plains	Endangered	-
Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions	Endangered	-
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	-	Endangered
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	-	Critically Endangered
Lowland Rainforest of Subtropical Australia	-	Critically Endangered
New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands	-	Critically Endangered
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	-	Endangered
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Critically Endangered
Weeping Myall Woodlands	-	Endangered
Poplar Box Grassy Woodland on Alluvial Plains	-	Endangered

5.2 Flora Survey Results

5.2.1 Vegetation Communities

The Subject Land and more particularly, the Development Footprint has been exposed to many years of extreme disturbance as a product of its use as a quarry. A significant portion of the site is highly disturbed consisting of excavated gravel pits. Undisturbed vegetation across the site consisted of eucalyptus woodland conforming to PCT 435 and PCT 433. This vegetation is classification is discussed in the following sections.

5.2.2 Vegetation Classification and Mapping

Vegetation communities were sampled by the vegetation plots described above and through walking random meander transects. Due to the limited extent of vegetation on the Subject Land this provided 100 % coverage. The random meander transects also allowed for a more comprehensive flora inventory on the Subject Land.

The vegetation communities were described from data collected during the vegetation plots and random meander transect studies. The vegetation classification is based on the NSW Plant Community Type (PCT) Classification.

Plant species were identified to species or subspecies level and nomenclature conforms to that currently recognised by the Royal Botanic Gardens and follows Harden and PlantNET for changes since Harden.

5.3 Plant Community Type Descriptions

Native vegetation occurs in varying conditions over the Subject Land with northern and central section's being completely devoid of vegetation and highly disturbed (quarry excavations). The areas of native vegetation within the development footprint include;

- PCT 435 White Box – White Cypress Pine shrub grass hills in the Brigalow Belt South Bioregion and Nandewar Bioregion,
- PCT433 - White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, Brigalow Belt South Bioregion

The following provides a description of the native vegetation within the Subject Land that occur within the subject site. Both PCTs are listed as Threatened Ecological Communities (TECs) and Endangered Ecological Communities (EECs) under the *EPBC Act* or *BC Act*.

A description of the vegetation communities sampled is provided below, with photos following. A map of the vegetation communities is provided in Table 4.

5.3.1 Community 1

Table 4: Vegetation community 1 description

Vegetation Community (NSW PCT)	435 – White Box – White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion.
Vegetation Formation	Dry Sclerophyll Forests (shrub/grass sub-formation)
Vegetation Class	North-west Slopes Dry Sclerophyll Woodlands
Land Zones & Area	Moderate – 0.8 ha, Low – 1.5 ha
EEC Status	BC Act White Box – White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions – Conforming EPBC Act - White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland - Conforming
Clearing Extent	58% with a percent accuracy of +/-50
Number of Plots	2
Location	Occurs within the centre of the Subject Land and extends in a modified form to the southern boundary.
Description	**Canopy:** Structure and Species: Tall to mid-high open woodland or woodland with trees dominated by Blakely's Red Gum (*Eucalyptus blakelyi*) White Box (*Eucalyptus albens*) occasionally with Kurrajong (*Brachychiton populneus subsp. populneus*) and White Cypress (*Callitris glaucophylla*). **Shrub layer:** Structure and Species: The shrub layer is sparse to absent in some areas. *Acacia paradoxa* and *Acacia ulicifolia* and *Cassinia arcuata* were common. *Pulteneae microphylla, Gompholobium aspalathoides* and *Styphelia trifolia* were uncommon. **Ground layer:** Structure and Species: The ground stratum is typically dense with good sites containing rich array of grasses and forbs. More abundant species included *Aristida benthamii, Aristida warburgii, Dichanthium sericeum, Cynodon dactylon* and *Digitaria brownii.* **a) Lianas, scramblers, etc.:**

	Scramblers include *Hardenbergia violacea, Glycine clandestina, Glycine tabacina* and *Desmodium varians*
Condition	This community was co dominated by *Eucalyptus albens* and *E. blakelyi* on hill crest and *E. blakelyi* only on the southern aspect. The mid story included scattered *Callitris glaucophylla* and *Brachychiton populnea.* The ground layer was dominated by grasses and in areas of sufficient topsoil diversity was high. Weed incursion across the site was typically low.

Photo Plate 1: PCT 435 at each Vegetation Plot

5.3.2 Community 2

Table 5: Vegetation community 2 description

Vegetation Community (NSW PCT)	433 – White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, BBS Bioregion
Vegetation Formation	Grassy Woodland
Vegetation Class	Western Slopes Grassy Woodland
Land Zones & Area	Moderate – 5.24
EEC Status	BC Act White Box – White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions – Conforming EPBC Act - White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland - Conforming
Clearing Extent	85% with a percent accuracy of +/-50
Number of Plots	3
Location	Occurs along the Eastern and Western boundary of the subject land. See Figure 5
Description	**Canopy:** Structure and Species: Tall to mid-high open woodland or woodland with trees heavily dominated by dominated by Box (*Eucalyptus albens*) occasionally with Kurrajong (*Brachychiton populneus subsp. populneus*) and Blakely's Red Gum (*Eucalyptus blakelyi*) occurring occasionally. **Shrub layer:** Structure and Species: The shrub layer is sparse to absent in some areas. *Acacia paradoxa* and *Acacia ulicifolia* and *Cassinia arcuata* were common. *Pulteneae microphylla* were uncommon. The

	shrub layer was likely modified throughout the Vegetation community and hence the full representation of shrub layer species was not present. **Ground layer:** Structure and Species: The ground stratum is typically dense with good sites containing rich array of grasses and forbs. More abundant species included *Chloris ventricosa, Wahlenbergia communis, Panicum buncei, Bothriochloa biloba, Aristida leptopoda* etc. **b) Lianas, scramblers, etc.:** Scramblers include *Hardenbergia violacea, Glycine clandestina, Glycine tabacina* and *Desmodium varians*
Condition	This community was dominated by *Eucalyptus albens* and *E. blakelyi* on hill crest and *E. blakelyi* only on the in small patches and ecotones. Overall the PCT occurred in good condition with area that contained old growth canopy vegetation.

Photo Plate 2: PCT 433 at Plot 4 & 5

5.3.3 Justification of PCT and Vegetation Zones

- PCT 435 - This community has the necessary diagnostic features, substrate and landscape position to enable its identification within the Subject Land. The PCT is present in a moderate condition with minor disturbance through weed incursion and historical clearing with some remnant canopy species.

  The Vegetation Zone classified as low condition for the PCT is present as a different structure to the moderate Vegetation Zone attributed to its position on the southern slope which appeared to have poorer soil quality and greater erosion of topsoil. Analysis of other potential PCTs found that PCT435 still was the most conforming of the available PCTs for the IBRA subregion and as such the same PCT was applied but broken into two distinct Vegetation Zones. The area is characterised by;

  - Contains scattered hollow bearing trees,
  - Contains scattered large trees over 49cm DBH,
  - Contains scattered fallen logs, &
  - Species diversity of ground cover was moderate to high, &
  - Weed coverage is relatively low.
- PCT433 – this community is consistent with the necessary diagnostic features, substrate and landscape position to enable its identification at this Subject Land. The area of PCT is present in a moderately disturbed state, with vegetated areas being largely remnant and with minor weed incursion. Some historical thinning of canopy trees was apparent however many mature canopy trees were present.

Analysis of other potential PCTs found that PCT433 was the most conforming of the available PCTs for the IBRA subregion a The area is characterised by;

- Contains scattered large trees over 49cm DBH,
- Contains scattered fallen logs, &
- Species diversity of ground cover was moderate to high, &
- Weed coverage is relatively low.

Figure 5: Vegetation Communities and proposed clearing

5.3.4 Threatened Flora

5.3.4.1 Results of Threatened Flora Survey

No threatened plants were recorded on the Subject Land.

5.3.4.2 Potential Occurrence Assessment

As detailed in Section 5.1.1 of this report, searches of relevant literature and databases (DPE 2022) found no records of threatened flora species in the locality. The Protected Matters Search Tool produced a list of additional 15 potential occurrences in the locality. These are assessed for their potential to occur on site in Appendix A-3. Bluegrass (*Dichanthium setosum)* is considered a moderate likelihood of occurring on site and as such a targeted survey for the species was undertake. This species or any other threatened flora were not identified onsite.

Given the past disturbance of the habitat and thorough search of vegetation during the flora survey, it is considered highly unlikely that any threatened flora species would occur on the Subject Land. Thus, no further threatened flora species are considered in the subsequent statutory assessments.

5.3.5 Threatened Ecological Communities

As detailed in Section 5.1.2.1 of this report, searches of relevant literature and databases found 17 threatened ecological communities were known or had the potential to occur in the locality. These were assessed for their potential to occur on the Subject Land in Appendix A-5

The vegetation on site is consistent with TEC - *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (Critically endangered) An assessment of the community following *Appendix 2* of *The National recovery plan for White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* and the NSW *White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland Final Determination* confirmed the community as the TEC.

5.4 Fauna Survey Results

5.4.1 Koala Habitat Assessment

As a Koala Plan of Management (KPoM) does not exist for the Subject Land and the land is zoned as SP1 Special Use, the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* applies. *Eucalyptus albens and E. blakelyi* are both listed as koala use trees under Schedule 2 of the SEPP 2021 and were recorded on the Subject Land. The area of impact however is 0.05 ha of native vegetation and highly unlikely to impact on the potential for Subject Land to act as koala habitat. In addition no koalas were recorded during the survey.

5.4.2 Habitat Evaluation, Corridors and Linkages

The following table summarises the habitat evaluation results and comments on regional/local corridors and habitat linkages.

Table 6: Summary of site habitat values

Habitat/ Attribute Type	Details
Groundcover	Open to dense grassy groundcover layer, depending on canopy cover and aspect.

Habitat/ Attribute Type	Details
Leaf litter	Leaf litter was dense across the Subject Land with the exception of the small area on the south-eastern boundary which showed signs of erosion.
Logs and debris	A small number of small logs were present throughout the vegetation zone. Two large log piles were present in the north-western patch.
Hollows	Hollow bearing trees were present in areas with larger eucalypts exists.
Nectar Sources	Eucalypt and Mistletoe species present on the Subject Land would flower throughout the year.
Sap and gum sources	The site contains a number of eucalyptus species that can produce/weep sap
Primary preferred Koala browse trees	Many Koala use tree species comprising *A. floribunda, E. albens & E. blakelyi*
Allocasuarina	No *Allocasuarina* were present in the Subject Land
Aquatic/ wetland habitats	2 small dams were present in cleared zones behind the refuse area.
Fruiting species	Few fruiting species were present in the understory and ground layer as forbs with sporadic *Dianella* and *Einadia* species present.
Forest bird habitat	Average to poor quality. Forested areas on sited are highly exposed with high edge effects and limited connectivity. The eastern sections of the vegetation zone have dense grassy understory and a scattered shrub layer providing little cover. . The south-west of the site lacks the dense grassy ground layer and provides less shrub layer. At the time of surveying the eucalypts were in flower which attracted a large number of lorikeets and honeyeater species. The central and northern portion of the site was largely cleared.
Caves, cliffs, overhangs, culverts, bridges	Absent. Absence of roosts for obligate Microchiropteran bats.
Small terrestrial prey	Some habitat provided in areas with dense leaf litter and better quality vegetation cover. Arboreal prey species such as possums and gliders would be rare due to the low abundance of hollow-bearing trees.
Habitat Linkages	Site is mostly surrounded by highly disturbed agricultural land to the east, an operational quarry to the north and northwest. There is some habitat connectivity provided to the south west via a similar size patch of remnant vegetation. This patch however is fragmented by agricultural land further to the south west. Habitat is highly fragmented in the surrounding locality.

Photo 2: Highly disturbed aquatic habitat within Development Footprint

5.4.3 Hollow-Bearing Trees

No hollow-bearing trees occur within the proposed Development Footprint. A number occur within the Subject Land however these are not likely to be impacted.

5.4.4 Observed/Detected Fauna

The surveys detected a limited range of fauna species due to the short survey period and modified conditions within the site. Some of the recorded species were observed on the site while others were seen flying overhead or heard calling from adjacent habitats. The surveys detected a range of fauna species over the Subject Land. Birds were the most common species detected (20), followed by mammals (3).

There were no threatened fauna species detected during the survey period.

Table 7, below provides the total fauna list for the site and details the method of detection for each species. No threatened fauna species were detected on site during field surveys.

Table 7: Fauna species recorded during the survey

Common Name	Scientific Name	Detection Method
White-winged Chough	*Corcorax melanorhamphos*	Vis
Noisy Friarbird	*Philemon corniculatus*	Vis
Noisy Miner	*Maronina melanocephala*	Vis
Grey Fantail	*Rhipidura albiscapa*	Vis
Pied Butcherbird	*Cracticus nigrogularis*	Vis
Eastern Rosella	*Platycercus eximius*	Vis
White-necked Heron	*Ardea pacifica*	Vis
Australasian Grebe	*Tachybaptus novaehollandiae*	Vis

Common Name	Scientific Name	Detection Method
Pied Cormorant	*Phalacrocorax varius*	Vis
Musk Lorikeet	*Glossopsitta concinna*	Vis
Crimson Rosella	*Platycercus elegans*	Vis
Weebill	*Smicrornis brevirostris*	Vis
Australian Magpie	*Cracticus tibicen*	Vis
Rufous Whistler	*Pachycephala rufiventris*	Vis
Striated Pardalote	*Pardalotus striatus*	Vis
Common Bronzewing	*Phaps chalcoptera*	Vis
Pacific Black Duck	*Anas superciliosa*	Vis
Laughing Kookaburra	*Dacelo novaeguineae*	Vis
King Parrot	*Alisterus scapularis*	Vis
Eastern Grey Kangaroo	*Macropus giganteus*	Vis
Feral Cat	*Felis catus*	Vis
Feral Pig	*Sus scrofa*	TR
Observation Key: Heard Calling (HC), PIR Camera (Cam), Scats (SC), Visual Observation (VIS), Tracks or scratching (TR) v		

5.4.5 Threatened Fauna

5.4.5.1 Detected Threatened Fauna

No threatened fauna species were detected during the survey period.

5.4.5.2 Potential Occurrence Assessment

There are several threatened fauna species that have been recorded in the locality in the Bionet Atlas of Wildlife search (DPE 2022) and spatial portal of Atlas of Living Australia, and a number of others are considered potential occurrences by the EPBC Protected Matters Search Tool (DCCEEW 2022). These species are evaluated for their potential to occur on the Subject Land and their eligibility/requirement for further assessment is included in this report as Appendix A-3

Note: Locally recorded marine species have not been addressed as there is no habitat for these species on the Subject Land.

6. Impact Assessment

6.1 Direct Impacts

The development proposal comprises land within Lot 213 DP1173230 and associated road easements. The total Development Footprint covers an area of 3.91 ha. Native vegetation loss, including vegetation considered a TEC and habitat loss associated with the proposal covers approximately 0.05 hectares.

The majority of vegetation exists outside of the proposed Development Footprint (Figure 5) with almost all of the Development Footprint being disturbed by gravel quarry extraction, this is a product of the iterative design process that the proponent and this consultant undertook to actively avoid Biodiversity Values within the site.

The proposed development has been designed to minimise impacts on vegetation and habitat values, locating most of the proposed disturbance in areas of minimal to no habitat values and outside of ground truthed TEC vegetation where possible. A total of 0.05 hectares of vegetation (TEC) is proposed to be cleared as part of the proposal to allow for suitable access.

6.2 Indirect Impacts

The following potential indirect impacts may be associated with the proposal:

a) ***Fragmentation and landscape change***: Landscape change will be highly localised within the subject land and will likely have minor to no impact on species. Fragmentation is likely to be minute and due to the remoteness of the vegetation impacted it is unlikely to have a measurable impact of the fragmentation of the landscape. In the long term long term, there is likely to be a net benefit in connectivity across the landscape as a proposed 0.3 ha rehabilitation area in the north east of the subject land will increase available habitat.

b) ***Injury/mortality during clearing:*** Due to the absence of the hollow bearing trees, understorey, natural groundcover, logs and other debris on the ground the potential habitat for most terrestrial fauna species is reduced and as such the likelihood for injury or mortality is low. However, the swamp habitat present on site does provide habitat for amphibian species and should be considered. Pre-clearing surveys by an ecologist in relation to the removal of trees and vegetation within and adjacent to inundated areas is recommended.

c) ***Edge effects:*** The subject site is situated at the current urban/agriculture/bushland interface; therefore edge effects are already a significant issue along the northern and western margins.

d) ***Fencing:*** Fences have potential to obstruct the movement of fauna across the site. Any additional or new fencing should be fauna friendly and not obstruct fauna movement.

e) ***Weed invasion:*** Weeds currently occur across the site. The proposal has the potential to introduce new weed species through planting of undesirable species or garden escapees invading the adjacent forest habitats.

f) ***Erosion and sedimentation:*** Standard mechanisms and controls will be required to ensure that erosion and sedimentation impacts do not extend beyond the development footprint where they could potentially impact other vegetation and drainage lines on adjacent land. Stormwater and runoff will need to be managed adequately to ensure that potential impacts are minimised.

g) Noise and vibration: The construction phase will temporarily increase noise levels however this will be diurnal only and is not expected to pose significant impacts to potentially occurring threatened species.

7. State Environmental Planning Policy (Biodiversity and Conservation) 2021

As the Subject Land is zoned as SP1 – Special Use, State Environmental Planning Policy (Biodiversity and Conservation) 2021 applies. Under Schedule 2 of this policy, *Eucalyptus albens* and *E. blakelyi,* are both considered potential koala use trees. These species make up the dominant canopy forming species on the Subject Land. The vegetated areas of the subject land therefore likely provide approximately 7 ha of potential koala habitat.

No koalas and no evidence of koala usage (i.e. scats) were recorded on the Subject Land during the survey period. A NSW Bionet Atlas search revealed only two koala records within 10 km of the Subject Land and no records within the Subject Land. The proposed area for clearing equates to 0.05 ha and constitutes a minute portion of the Subject Land and even smaller portion of potential habitat that exists in the locality. The proposed development is unlikely to impact on the koala directly or indirectly and the proposed 0.3 ha rehabilitation area will, in time, increase potential koala habitat within the local landscape.

It is concluded that although potential koala habitat exists on the Subject Land that the use of this site is extremely low by the species and the likelihood of impact is negligible.

8. Biodiversity Conservation Act Assessment

8.1 Assessment Pathway

Under the NSW *Biodiversity Conservation Act 2016* and *Biodiversity Conservation Regulation 2017*, Part 4 developments under the *Environmental Planning & Assessment Act 1979* (other than State Significant Development) are assessed through the following process:

- For developments in which the impact exceeds the clearing threshold, will impact any area mapped on the Biodiversity Value Map or impact on an area of Outstanding Biodiversity Value, a Biodiversity Development Assessment Report (BDAR) will be required. This assesses the impact using the Biodiversity Assessment Method (BAM) and determines the offset obligations required. Offsets can be met through several options including:
    - Purchase and retirement of biodiversity credits from the open market.
    - Establish a biodiversity stewardship site and create credits via managing the land for conservation in perpetuity.
    - Pay an amount of money into the newly established Biodiversity Conservation Trust who will source credits on behalf of the proponent.
- Developments which fall below the clearing threshold and do not impact on sensitive biodiversity values must be assessed under the new five part test of significance (replacing the former seven part test). If the test determines that a significant impact is likely, a BDAR will be required. There is no offset obligation for Part 4 developments which fall below the threshold and/or are unlikely to have a significant impact on threatened species and/or ecological communities.

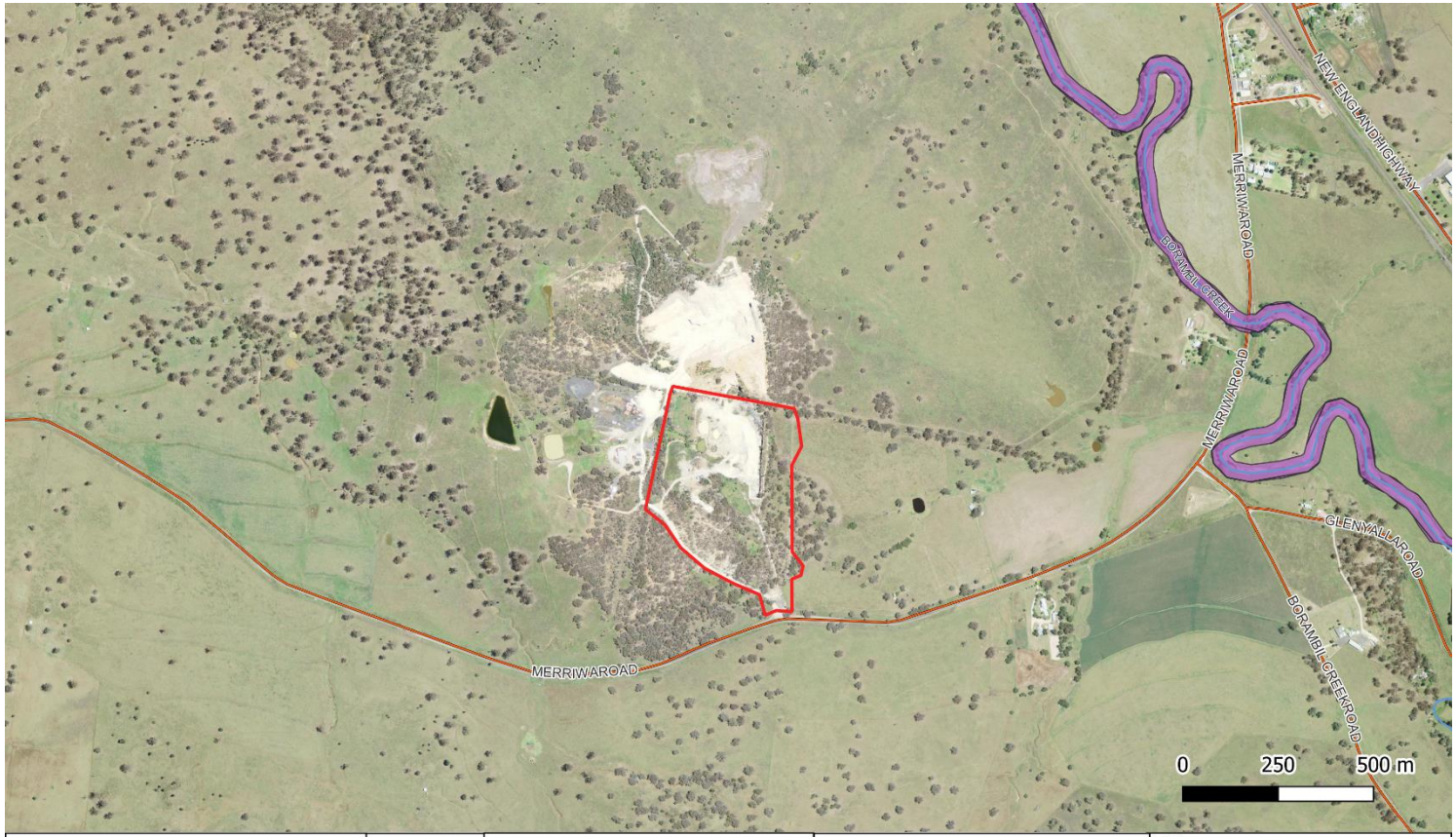
The table below provides an assessment to determine if a BDAR is required.

Table 8: Assessment of BDAR requirement

Criteria	Response
Will the development require clearing of native vegetation?	Yes
Has the development been granted Biodiversity Certification?	No
Is the development considered State Significant Infrastructure?	No
Does the development affect an area mapped in the NSW Biodiversity Values Map?	No – refer to Figure 7
Minimum lot size on which the development is located.	4,076 sqm
Will the development require the removal of >0.5 ha of vegetation?	No – Development will remove only 0.05ha of native vegetation
Result	BDAR not required

The above assessment has determined that a BDAR is not required for the proposal. The next stage of the assessment which determines whether the development is likely to have a significant effect on threatened species or ecological communities is provided below.

Figure 6: Biodiversity Values Mapping with Subject Land marked red



This mapping is to be considered indicative only and all derivations (eg of areas of EECs and vegetation communities) are at best approximations and subject to errors including individual interpretation and reliance on information provided to Biodiversity Australia where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping, ect. should be placed upon this map without independent validation of the information by the user.Biodiversity Australia takes no responsibility for any sudsequent error losses etc. that may arise from use of this data without independent verification.	Project Manager: KR Drawn By: LW Date: 13 May 2022 Map Projection: MGA Zone 56 Datum: GDA1994	Figure Name: Biodviersity Values Site: Willow Tree WMF Expansion Client: GHD	**Legend** Development Site Biodiversity Values N	Biodiversity AUSTRALIA QGIS Job Number: ENS5225 Scale: 1:15000 Page: 1 of 1 Veriation A

8.2 Test of Significance

The Test of Significance is prescribed under Part 7, Division 1, Section 7.3 of the *Biodiversity Conservation Act 2016*. The purpose of the Test of Significance is to determine whether a proposed development or activity is likely to significantly effect threatened species or ecological communities, or their habitats. If it is determined that a development or activity will have a significant effect, a Biodiversity Development Assessment Report will be required. The Test of Significance has been prepared in consideration of the *Threatened Species Test of Significance Guidelines* (OEH 2018).

8.2.1 Entities to be Assessed

The Potential Occurrence Assessment in Appendix A-3 has determined that a total of 6 Matters of State Environmental significance (5 species and one vegetation community) potentially / do occur in the development footprint of the site. These are described in the table below and are the subject to a Test of Significance under the BC Act. The BC Act Significant Impact Tests are presented in Appendix A-4

Species		Extent of potential occurrence	Likelihood of occurrence
Common Name	**Scientific Name**		
Koala	*Phascolarctos cinereus*	Foraging and breeding habitat available within the subject site	Moderate
Grey-headed Flying-fox	*Pteropus poliocephalus*	Foraging habitat only	Moderate
Painted Honeyeater	*Grantiella picta*	Foraging and breeding habitat available within the subject site	Fair
Little Eagle	*Hieraaetus morphnoides*	Foraging habitat available within the subject site	Moderate
Masked Owl	*Tyto novaehollandiae*	Foraging habitat available within the subject site	Moderate
Ecological Community			
PCT433 – White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, BBS Bioregion.		A total of 5.2 hectares of the site contains this vegetation community	Present

A Key Threatening Process (KTP) is defined as a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities.

The following table lists all of the current KTP's listed under the *BC Act* and whether the proposed activity is recognised as a threatening process.

Table 9: Contribution to Key Threatening Processes

Key Threatening Processes	Will Proposal Affect KTP?
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners *Manorina melanocephala*	No – this project is unlikely to exacerbate this process
Alteration of habitat following subsidence due to longwall mining	No

Key Threatening Processes	Will Proposal Affect KTP?
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	No
Anthropogenic Climate Change	Yes – Vegetation removal and greenhouse gasses generated by machinery used during construction
Bush rock removal	No
Clearing of native vegetation	There is a small amount of native vegetation removal. 0.05 ha.
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus*	No - European Rabbit already occurs within the area
Competition and habitat degradation by Feral Goats, *Capra hircus*	No
Competition from feral honey bees, *Apis mellifera*	No
Death or injury to marine species following capture in shark control programs on ocean beaches	No
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments	No
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	No
Herbivory and environmental degradation caused by feral deer	No
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	No
Importation of Red Imported Fire Ants *Solenopsis invicta*	No
Infection by *Psittacine Circoviral* (beak and feather) Disease affecting endangered psittacine species and populations	No
Infection of frogs by amphibian *chytrid* causing the disease chytridiomycosis	No
Infection of native plants by *Phytophthora cinnamomi*	No
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	No
Introduction of the Large Earth Bumblebee *Bombus terrestris*	No
Invasion and establishment of exotic vines and scramblers	No, not beyond current conditions
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)	No
Invasion and establishment of the Cane Toad (*Bufo marinus*)	No
Invasion of native plant communities by African Olive *Olea europaea subsp. cuspidata*.	No
Invasion of native plant communities by *Chrysanthemoides monilifera*	No

Key Threatening Processes	Will Proposal Affect KTP?
Invasion of native plant communities by exotic perennial grasses	Unlikely
Invasion of the Yellow Crazy Ant, *Anoplolepis gracilipes* into NSW	No
Invasion, establishment and spread of Lantana (*Lantana camara*)	Low likelihood of Lantana being introduced to the Subject Land.
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	No
Loss of Hollow-bearing Trees	No
Loss or degradation (or both) of sites used for hill-topping by butterflies	No
Predation and hybridisation by Feral Dogs, *Canis lupus familiaris*	No
Predation by *Gambusia holbrooki* (Plague Minnow or Mosquito Fish)	No
Predation by the European Red Fox *Vulpes vulpes*	No
Predation by the Feral Cat *Felis catus*	Not beyond current conditions.
Predation by the Ship Rat *Rattus rattus* on Lord Howe Island	No
Predation, habitat degradation, competition and disease transmission by Feral Pigs, *Sus scrofa*	No

8.3 Conclusion

The Test of Significance has determined that the proposed development would not result in a significant impact on threatened species or ecological communities. Therefore, a BDAR is not required for the development proposal.

9. EPBC Act 1999 - MNES Assessment

9.1 General Assessment Overview

The provisions of the *EPBC Act (1999)* require determination of whether the proposal has, will or is likely to have a significant impact on a "matter of national environmental significance" (MNES). These matters are listed and addressed in summary as follows:

1) **World Heritage Properties:** The site is not listed as a World Heritage area nor does the proposal affect any such area.

2) **National Heritage Places**: The site is not listed as a National Heritage Place nor does the proposal affect any such area.

3) **Ramsar Wetlands of International Significance:** A Ramsar wetland does not occur on the site, nor does the proposal affect a Ramsar Wetland.

4) **EPBCA listed Threatened Species and Communities:** the Protected Matters data base search (Appendix A-6) identified the potential for:

   - 36 threatened species
   - 7 Migratory Species and
   - 7 Threatened Ecological community's

   A Potential Occurrence assessment (Appendix A-3) was undertaken to determine the likelihood of these species and communities occurring onsite. The results of this assessment are summarised in Table 10, below.

Table 10: Summary of EBPC Potential Occurrence Assessment

Common Name	Scientific Name	Extent of potential occurrence	Likelihood of occurrence
Koala	*Phascolarctos cinereus*	Foraging and breeding habitat available within the subject site	Moderate
Grey-headed Flying-fox	*Pteropus poliocephalus*	Foraging habitat only	Moderate
Painted Honeyeater	*Grantiella picta*	Foraging and breeding habitat available within the subject site	Fair
Ecological Community			
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland - (PCT433 – White Box grassy woodland to open woodland on basalt flats and rises in the Liverpool Plains sub-region, BBS Bioregion.)		A total of 5.2 hectares of the site contains this vegetation community	Present

Using the *Matters of National Environmental Significance – Significant impact guidelines 1.1* (Significant Impact Guidelines), (Department of Environment (DoE) 2013) a self-assessment determined that the potential impacts on MNES were not considered *Significant.* The assessment is presented in Appendix A-4-7.

The results of the outline that the proposed development will not have a significant impact on these MNES

5) **Migratory Species Protected under International Agreements:** No Migratory species are likely to be significantly affected by the proposal as assessed below.

6) **The Commonwealth Marine Environment (CME):** The site is not within the CME nor does it affect such.

7) **The Great Barrier Reef Marine Park:** The proposal does not affect the Great Barrier Reef Marine Park.

8) **Nuclear Actions:** The proposal is not a nuclear action.

9) **A water resource, in relation to coal seam gas development and large coal mining development:** The proposal is not a mining development.

It is considered that the proposal is not required to be referred to Department of Climate Change, Energy, the Environment and Water (DCCEEW) for approval under the *EPBC Act (1999).*

9.2 Protected Matters Assessments

The potential occurrence assessment (Appendix A-3) identified the potential for three significant species and one community, under the EPBC act to potentially occur on site, namely:

- Koala,
- Grey headed flying fox,
- Painted Honeyeater, and
- White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland

An significance assessment on these species and community is provided in Appendix A-4-7

9.3 Recommendations

The following are recommended to be included as conditions of consent if the proposal is approved. The conclusions of this assessment assume the measures are implemented and effective in mitigating impacts.

9.4 General Clearing Measures

The following measures are recommended to manage clearing:

- The extent of the development footprint is to be clearly marked (e.g. via pegging/ fencing/ flagging) before clearing in order to prevent any inadvertent clearing beyond what is required and has been assessed and to avoid damage or encroachment into the root zone of retained trees. This fencing/ marking is to remain until all clearing and construction is completed.
- Site induction is to specify that no clearing is to occur beyond the marked area. All vehicles are only to be parked in designated areas.
- Clearing and earthworks is to avoid damage to root zones of any retained trees.
- Weeds are not to be mulched with native vegetation and should be taken to a licenced landfill facility.

9.5 Animal Welfare Considerations

The following is recommended to be implemented to minimise risk of direct mortality of fauna during clearing works:

- The area of clearing work is to be inspected for fauna by an ecologist immediately prior to commencement of any vegetation removal involving machinery and/or tree-felling. Pre-clearing

checks will include searches of habitat e.g. lifting and destruction of logs, searches for bird nests, and raking of leaf litter. Any detected fauna is to be relocated off-site. Any bird nest considered active is to be removed in a manner that allows retrieval of eggs/young, and these are to be taken into care by FAWNA.

9.6 Sedimentation and Erosion Control

Standard soil and sedimentation control measures will be required throughout the clearing works to ensure that habitats on the site and in the study area, including the ephemeral stream are not substantially affected by erosion and sedimentation.

9.7 Weed Control

Disturbance of the development site's soils and vegetation removal has potential to encourage weed invasion. Hence, it is recommended that:

- Disturbance of vegetation and soils on the site should be limited to the areas of the proposed work and should not extend into adjacent vegetation.
- All plant used for clearing and construction works is to be inspected for presence of weeds.
- Appropriate collection and disposal of all weed material removed via clearing.
- Removal of any new weed infestations that have developed throughout the construction phase.

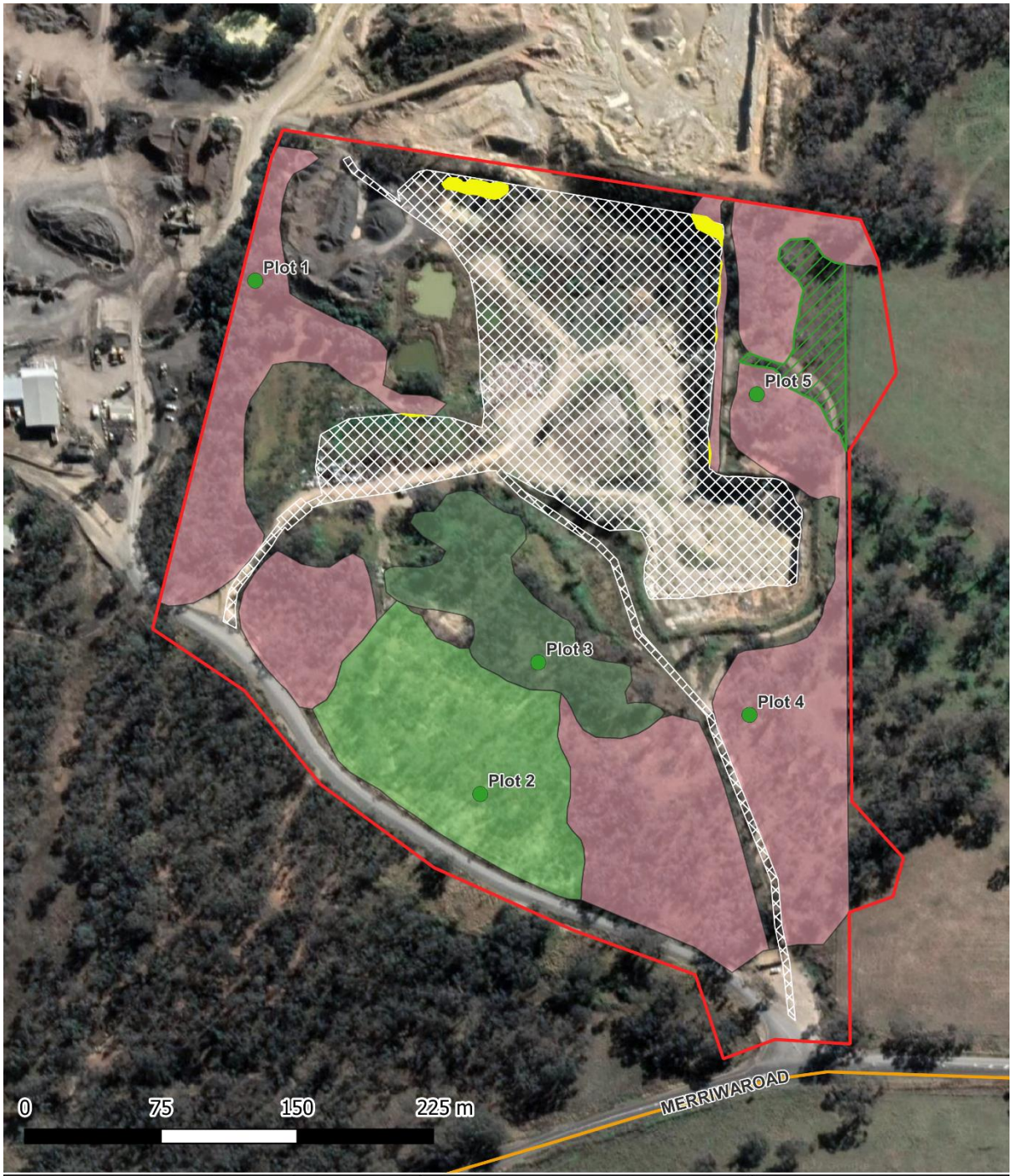
9.8 Threatened Ecological Community Rehabilitation

The site has recorded a significant area (approximately 7.61 hectares) of Critically Endangered *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*, with approximately 6.05 hectares in *moderate* condition and 1.56 hectares in *poor* condition. The development proposes to remove a minute portion of this (0.05 ha) of TEC in moderate condition. The significance assessment (Appendix A-5) deemed that the loss of 0.05 ha through the proposed development would not have a significantly detrimental impact on the TEC and therefore referral to DCCEEW is not required.

Although no significant impact was determined the precautionary principle has been applied to the proposal and an area of 0.3 ha is proposed for rehabilitation. The proposed rehabilitation area is depicted in Figure 1. Under the *EPBC Act* 1999 this offsetting area has been assessed using the *Offset assessment guide* and determined that the proposed rehabilitation area would meet minimum 90% offsetting requirement as shown below in Table 11. To guide the restoration of the rehabilitation area and surrounding TEC a Vegetation Management Program is recommended which would include specific actions and outcomes of the rehabilitation area.

It should be noted that a successful rehabilitation program of the above size will give a net increase in area of the TEC and improve the condition of the TEC that currently exists on the subject land.

Figure 7: Proposed Rehabilitation Area



This mapping is to be considered indicative only and all derivations (eg of areas of EECs and vegetation communities) are at best approximations and subject to errors including individual interpretation and reliance on information provided to Biodiversity Australia where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping, ect. should be placed upon this map without independent validation of the information by the user. Biodiversity Australia takes no responsibility for any sudsequent error losses etc. that may arise from use of this data without independent verification.

Biodiversity AUSTRALIA

QGIS

Project Manager:	KR
Drawn By:	LW
Date:	December 2022
Map Projection:	MGA Zone 56
Datum:	GDA2020
Page:	1 of 1

Legend

- Development Footprint
- Subject Land
- Rehabilitation Area
- BAM Plot
- PCT 433 - Moderate - Good
- PCT435 - Moderate
- PCT435 Low
- Total Native Vegetation Cleared

N

Figure Name:
Proposed Rehabilitation Area

Site:
Willowtree WMF

Client:
GHD

Scale:	Job Number:	Veriation:
1:2000	ENS5225	B

Table 11: Table excerpt from EPBC Offset assessment guide.

Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)		% of impact offset	Minimum (90%) direct offset requirement met?
0.3	**Risk-related time horizon (max. 20 years)**	20	**Start area (hectares)**	0.3	**Risk of loss (%) without offset**	2%	**Risk of loss (%) with offset**	0%	0.01	80%	0.00	0.00	0.07	494.15%	Yes
					Future area without offset (adjusted hectares)	0.0	**Future area with offset (adjusted hectares)**	0.3							
	Time until ecological benefit	10	**Start quality (scale of 0-10)**	**1**	**Future quality without offset (scale of 0-10)**	**1**	**Future quality with offset (scale of 0-10)**	**8**	6.00	80%	4.80	2.49			

9.9 Fencing

Temporary fencing may be required during earthworks and construction. Fences have potential to obstruct the movement of fauna across the site. Any fencing required should be permeable and not pose a barrier or risk of entanglement to fauna (e.g. post and plain wire).

10. Conclusion

This report has assessed the impact in relation to a proposed extension to an existing Waste Facility at Willow Tree, NSW. The proposed Development Footprint has been designed to minimise impact on the native vegetation of the Subject Land. The total area of impact is 0.05 ha.

No threatened flora or fauna species were recorded during the survey. However the vegetation on site does qualify as White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Grassland TEC. A number of threatened species were deemed to have a moderate to fair chance of occurring on the Subject Land. However, given only 0.05 ha of native vegetation is proposed to be removed it is considered unlikely that the proposed development will have a significant impact on these species.

Although a significant impact to the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is not expected due to the minute area of impact, under the precautionary principle a 0.3 ha rehabilitation area has been proposed to offset the proposed clearing. The proposed ameliorative measures that the rehabilitation area would have will, over time, improve the quality and extent of the TEC. It will also improve resources and habitat available on the subject land for any threatened fauna that may occur.

The Development does conform to potential Koala habitat under the State Environmental Planning Policy (Biodiversity and Conservation) 2021. However, the minute impact area of the proposed development will not reduce the available habitat on the subject land to an extent that would impact negatively on the species.

The Subject Site does not include Coastal Wetlands or Littoral Rainforest pursuant to the Resilience and Hazards SEPP.

The Subject Site is not deemed to have a negative impact on any other areas of significant biodiversity value.

Consequently, the proposal is not considered to require a Biodiversity Development Assessment Report, or referral to the DCCEEW for approval under the EPBC Act.

11. References

Australian Koala Foundation (2007). Planning Guidelines for Koala Conservation and Recovery: A Guide to Best Planning Practice. Australian Koala Foundation, Brisbane. Website <www.savethekoala.com.au>.

Biodiversity Conservation Act (2016). Website <https://www.legislation.nsw.gov.au/~/view/act/2016/63>.

Brooker, MIH & Kleinig, DA (2006). *Field Guide to Eucalypts*. *Volume 1, South-eastern Australia*, Bloomings Books, Hawthorn, Victoria.

Department of Environment (DOE) (2013) Matters of National Environmental Significance – Significant impact guidelines 1.1 Commonwealth of Australia

Department of Environment and Conservation (DEC 2004). Threatened Biodiversity Survey and Assessment: Guidelines for Development and Activities. Working Draft. NSW DEC, Hurstville.

Department of Environment and Climate Change (DECC 2007). Threatened Species Assessment Guidelines: The Assessment of Significance. NSW DECC, Hurstville.

Department of the Environment (2022). Chalinolobus dwyeri in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Dasyurus maculatus maculatus (SE mainland population) in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Nyctophilus corbeni in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Petauroides volans in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Petaurus australis australis in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022 15:20:10 +1000.

Department of the Environment (2022). Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Office of Environment and Heritage (2022). Pteropus poliocephalus in Threatened species profiles, Office of Environment and Heritage, NSW. Available from: https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10697. Accessed Wed. 14 Sep 2022.

Department of the Environment (2022). Anthochaera phrygia in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Botaurus poiciloptilus in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Calidris ferruginea in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Callocephalon fimbriatum in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Calyptorhynchus lathami lathami in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Falco hypoleucos in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Grantiella picta in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Office of Environment and Heritage (2022). Hieraaetus morphnoides in Threatened species profiles, Office of Environment and Heritage, NSW. Available from: https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=20131 . Accessed Wed. 14 Sep 2022.

Department of the Environment (2022). Hirundapus caudacutus in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Lathamus discolor in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Numenius madagascariensis in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Polytelis swainsonii in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Rostratula australis in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Office of Environment and Heritage (2022). Tyto novaehollandiae in Threatened species profiles, Office of Environment and Heritage, NSW. Available from: https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10820 . Accessed Wed. 14 Sep 2022.

Department of the Environment (2022). Aprasia parapulchella in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Delma impar in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Uvidicolus sphyrurus in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Litoria booroolongensis in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Maccullochella peelii in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Wed, 14 Sep 2022.

Department of the Environment (2022). Androcalva procumbens in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

Department of the Environment (2022). Cadellia pentastylis in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

Department of the Environment (2022). Dichanthium setosum in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

Department of the Environment (2022). Eucalyptus nicholii in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

Department of the Environment (2022). Euphrasia arguta in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

Department of the Environment (2022). Haloragis exalata subsp. velutina in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

Department of the Environment (2022). Lepidium aschersonii in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

Department of the Environment (2022). Lepidium monoplocoides in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

Department of the Environment (2022). Pomaderris brunnea in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

Department of the Environment (2022). Prasophyllum sp. Wybong (C.Phelps ORG 5269) in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

Department of the Environment (2022). Vincetoxicum forsteri in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: https://www.environment.gov.au/sprat. Accessed Thu, 15 Sep 2022.

DECC (2008). Recovery Plan for the Koala (Phascolarctos cinereus). NSW DECC, Hurstville.

Department of Climate Change, Energy, the Environment and Water (DCCEEW 2022). Matters of National Environmental Significance Search Tool. Website <www.environment.gov.au/epbc>.

Eby, P. (2000). A Case for Listing Grey-Headed Flying Fox (Pteropus poliocephalus) as Threatened in NSW Under IUCN Criterion A2. In: Proceedings of a Workshop to Assess the Status of the Grey-Headed Flying Fox in NSW. Richards, G. (Ed.). Australasian Bat Society, Sydney.

Environment Protection Biodiversity Conservation Act (1999) https://www.legislation.gov.au/Series/C2004A00485.

Harden, G.J. (Editor) (1990) Flora of NSW. Vol 1-4. NSW Press, Sydney.

Harden, G.J, McDonald, B. and Williams, J.B. (2007). Rainforest Climbing Plants – A field guide to their identification. Gwen Harden Publishing, Nambucca Heads.

Jurskis, V. and Potter, M. (1997). Koala Surveys, Ecology and Conservation at Eden. Research Paper No. 34. State Forests, Sydney.

NSW Government (1995). Koala Habitat Protection SEPP 2021

BAM threatened flora survey methodology

DPE (2018). Threatened Species Test of Significance Guidelines.

DPE (2022a) Bionet/Atlas of Wildlife. Website <http://www.bionet.nsw.gov.au/>.

DPE (2022b) Threatened Species. Website <www.threatenedspecies.environment.nsw.gov.au>.

Phillips, S, and Callaghan, J. (1995). The Spot Assessment Technique for determining the significance of habitat utilisation by Koalas. Addendum to *Proceedings of a conference on the status of the Koala in 1995*. Australian Koala Foundation. Brisbane.

Phillips, S. and Callaghan, J. (2011). The Spot Assessment Technique: a tool for determining levels of localised habitat use by Koalas *Phascolarctos cinereus*. *Australian Zoologist* **35**(3): 774-780.

Royal Botanical Gardens (2019). PlantNET. Website <www.plantnet.rbgsyd.nsw.gov.au/search>.

Triggs, B. (1996). Scat, track and other traces. New Holland, Sydney.

Troedson, A.L. and Hashimoto, T.R. (2008). Coastal Quaternary Geology – north and south coast of NSW. Geological Survey of New South Wales, Bulletin 34.

Van Dyck, S., Gynther, I. and Baker, A. (2013). Field Companion to the Mammals of Australia. Brisbane, Australia: New Holland Publishers.

12. Appendices

A-1 C.V. Suitably Qualified And Experienced Person (Karl Robertson).

Karl Robertson

Karl Robertson –Senior Business Manager and Principal Ecologist

Bachelor of Environmental Science and Management,

BAM Accredited Assessor

DAWE- Suitably Qualified and Experienced Practioner- Ecology, Chemical Cert Prepare and Apply Chemicals, Chemical Cert Store and Transport Chemicals, Operate 4WD Vehicle, First Aid and CPR, White Card

Karl is the Senior Business Manager and Principal Ecologist at Biodiversity Australia and has been with the company for 12 years. Joining Biodiversity Australia as a Senior Ecologist, Karl has gained a holistic knowledge of Australian Ecology through advanced survey and assessment skills. These skills have enabled Karl to develop extensive knowledge of Australian native and exotic fauna and flora.

Karl has applied his expertise to numerous industry sectors on a diverse range and complexity of projects ranging from residential developments to billion dollar infrastructure projects. Karl's key sectors include Government (Federal, State and Local), coal, gas and mining, linear infrastructure and construction. Karl has undertaken the role of Project Manager on numerous large value contracts.

Karl has a broad understanding of both State and Territory and Federal legislation, having prepared an extensive number of Ecological Assessments, Monitoring Reports and referral documents. He has further worked on preparation of Reviews of Environmental Factors, Vegetation Management Plans and Control Plans for Exotic Flora. As an accomplished spatial analyst Karl has experience in the use of ArcGIS and MapInfo as well as a vast range of data collection software (GBM Mobile, GIS Pro, Weed Map Pro) and hardware (Trimble, iPad, GPS, Toughbook).

As a further summary of expertise Karl acted as Project Manager within several recent rehabilitation projects including:

1. Jmac Constructions, Cannon Hill development bush regeneration project.
2. Department of Defence -Weed Control projects
3. Boral Quarries, Narangba Environmental Restoration
4. Yarrabilba Natural Area Rehabilitation project
5. Tillegra Riparian Improvement Project for Hunter Water
6. Roycorp, Thornlands Bush Rehabilitation Program

A-2 Site Vegetation List

Common Name	Scientific Name
Trees and Shrubs	
Baker's Wattle	*Acacia bakeri*
Kurrajong	*Brachychiton populneus*
White Box	*Eucalyptus albens*
Blakely's Red Gum	*Eucalyptus blakelyi*
Dwyers Red Gum	*Eucalyptus dwyeri*
Sticky Wattle	*Acacia viscidula*
Native Olive	*Notelaea microcarpa*
Needle Shaggy Pea	*Podolobium aciculiferum*
Pinnate Wedge Pea	*Gompholobium pinnatum*
Dolly Bush	*Cassinia aculeata*
Western Silver Wattle	*Acacia decora*
Kangaroo Thorn	*Acacia paradoxa*
Native Currant	*Leptomeria acida*
-	*Pultenaea microphylla*
-	*Solanum sp.*
Climber and Scramblers	
-	*Glycine clandestina*
-	*Glycine tabacina*
Grasses	
-	*Digitaria ramularis*
Tussock Grass	*Poa labillardieri*
Ringed Wallaby Grass	*Rytidosperma caespitosum*
Barbed Wire Grass	*Cymbopogon refractus*
Three-awned Spear Grass	*Aristida benthamii*
-	*Aristida warburgii*
Shorthair Plumegrass	*Dichelachne micrantha*
Two-colour Panic	*Panicum simile*
Western Rat-Tail Grass	*Sporobolus creber*
Red Grass	*Bothriochloa decipiens*
Plump windmill grass	*Chloris ventricosa*
Couch	*Cynodon dactylon*
Cotton Panic Grass	*Digitaria brownii*
Wiry Panic	*Entolasia stricta*
Wattle Mat-rush	*Lomandra filiformis*
-	*Panicum effusum*

Common Name	Scientific Name
-	*Rytidosperma racemosum*
-	*Lomandra spicata*
Forbs	
Crane's Bill	*Geranium neglectum*
Bristly cloak fern	*Cheilanthes distans*
Bears Ears	*Cymbonotus lawsonianus*
-	*Plantago debilis*
-	*Poranthera microphylla*
Sprawling Bluebell	*Wahlenbergia gracilis*
Native Geranium	*Geranium solanderi*
Native Carrot	*Daucus glochidiatus*
Slender Tick-trefoil	*Desmodium varians*
Forest Nightshade	*Solanum prinophyllum*
-	Trefoil sp.
Tufted Bluebell	*Wahlenbergia communis*
-	*Youngia japonica*
Blue Flax-lily	*Dianella revoluta*
Kidney Weed	*Dichondra repens*
Cobblers Tack	*Glossocardia bidens*
Fuzzweed	*Vittadinia cuneata*
Weeds	
Cobblers Pegs	*Bidens pilosa*
Narrow-leaved Cotton Bush	*Gomphocarpus fruticosus*
Inkweed	*Phytolacca octandra*
Plantain	*Plantago lanceolata*
Peppercorn	*Schinus molle*
-	*Sida cordifolia*
Blackberry Nightshade	*Solanum nigrum*
Purpletrop	*Verbena bonariensis*
Flaxleaf fleabane	*Erigeron bonariensis*
Balloon Cottonbush	*Gomphocarpus physocarpus*
Common Prickly Pear	*Opuntia stricta*
Stinking Roger	*Tagetes minuta*
Scarlet Pimpernel	*Lysimachia arvensis*
Tiger Pear	*Opuntia aurantiaca*
Catsear	*Hypochaeris radicata*

A-3 Potential Occurrence Assessment

The following tables are used as a summary to address threatened species in terms of potential occurrence and requirement for formal assessment. A threatened species has been assessed if it is:

a) Recorded on-site; or

b) Not recorded on site, but recorded within a 10 kilometre radius (the locality), and may occur to some degree on-site due to potential habitat, key habitat component, etc.

Likelihood of occurrence is based on the probability of occurrence in terms of:

- Habitat extent (e.g. sufficient to support an individual or the local population; comprises all of home range; forms part of larger territory, etc.); quality (i.e. condition, including an assessment of threats, historical land uses on and off-site, and future pressures); interconnectivity to other habitat; and ability to provide all the species life-cycle requirements (either the site alone, or other habitat within its range);
- Occurrence frequency (i.e. on-site resident; portion of larger territory or seasonal migrant); and
- Usage i.e. breeding or non-breeding; opportunistic foraging (e.g. seasonal, migratory or opportunistic); marginal fringe of core range; refuge; roosts; etc.

An indicative 1-5 scale used by the author to indicate the likelihood of the species to potentially occur in the habitat on the study sites (if they have not been recorded in the locality) is as follows:

- 0: *Unlikely* (<1% probability) - no potentially suitable habitat; too disturbed; or habitat is very poor. No or few records in region or records/site very isolated e.g. by pastoral land, urbanisation, etc.
- 1: *Low* (1-25%) - few minor areas of potential habitat; highly modified site/habitat; or few habitat parameters present, but others absent or relatively insignificant (sub-optimum habitat). Usually very few records in locality.
- 2: *Fair* (25-50%) - some significant areas of potential habitat, but some habitat parameters limited. Potential for occasional foraging e.g. from nearby more optimal areas or known habitat. Records at least within 10-15 km radius of site.
- 3: *Moderate* (50-75%) - quite good potentially suitable habitat on and adjacent to the site, and/or good quality and abundance of some vital habitat parameters. Records within <10km, or adjacent to site, or adjacent to high quality habitat where species likely to occur.
- 4: *High* (>75%) - very good to optimum habitat occurring on or adjacent to the site (support breeding pair or population). Recorded within 5-10km of site in same or similar habitat.

Table 12: Potential occurrence assessment

Common Name	Scientific Name	BC Act	EPBC Act	ID Within 10km (ALA)	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
Mammals								
Large-eared Pied Bat, Large Pied Bat	*Chalinolobus dwyeri*	V	V	N	The species requires a combination of sandstone cliff/escarpment to provide roosting habitat that is adjacent to higher fertility sites,	Unlikely	The species has no records within the locality. The Subject Land does not contain preferred habitat (cliffs and caves) for the species.	No.
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	*Dasyurus maculatus maculatus (SE mainland population)*	V	E	N	Mainly forest dependent but occurs in a variety of habitats including closed forests (including temperate and sub-tropical rainforest), tall eucalypt forests, open woodlands, open forests, drier rain-shadow woodlands and coastal heathlands.	Unlikely	Although the Subject Land has potential habitat, it's unlikely this species would occur due to minimal large tracks of vegetation surrounding the site, no know records within 10 km.	No.
Corben's Long-eared Bat, South-eastern Long-eared Bat	*Nyctophilus corbeni*	V	V	N	Found in a wide range of inland woodland vegetation types including box / ironbark / cypress pine woodlands, Buloke woodlands, Brigalow woodland, Belah woodland, smooth-barked apple woodland, river red gum forest, black box woodland, and various types of tree mallee.	Low	Although the Subject Land has potential habitat, the species prefers extensive areas of stands of vegetation rather than smaller woodland areas. it's unlikely this species would occur, no know records within 10 km.	No.
Petauroides volans	*Greater Glider (southern and central)*	NL	E	N	Largely restricted to eucalypt forests and woodlands of eastern Australia. Found in highest abundance in older taller, montane, moist eucalypt forests on fertile soils. With abundant hollows.	Unlikely	The species has no records within the locality. Requires tall standing eucalyptus usually along watercourses. The Subject Land contains a small number of hollows which may suit the species.	No.

Common Name	Scientific Name	BC Act	EPBC Act	ID Within 10km (ALA)	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
Petaurus australis australis	*Yellow-bellied Glider (south-eastern)*	V	V	N	Eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests, but preference for large patches of mature old growth forest that provide suitable trees for foraging and shelter.	Unlikely	The species has no records within the locality. The Subject Land contains a small number of hollows which may suit the species.	No.
koala	*Phascolarctos cinereus*	E	E	Y	Coastal and inland areas that are typically characterised by Eucalyptus forests and woodlands.	Moderate	Subject Land not identified as important habitat. The nearest geographical record is on the northern side of the Willow tree township. Species potentially uses the site.	Yes.
Pteropus poliocephalus	*Grey-headed Flying-fox*	V	V	N	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Moderate	The Subject Land does not contain any evidence of a roosting colony. Site contains high number of flowering eucalyptus. Site likely used by the species for foraging.	Yes.
Birds								
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	N	Mostly inhabits inland slopes of the Great Dividing Range, in areas of low to moderate relief with moist, fertile soils. It is most commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest.	Unlikely	Although the Subject Land has potential habitat, it's unlikely this species would occur, may overfly or pass through as foraging no know records within 10 km.	No
Australasian Bittern	*Botaurus poiciloptilus*	E	E	N	Freshwater wetlands and, favours wetlands with tall dense vegetation, dominated by sedges, rushes and reeds.	Unlikely	The Subject Land does not contain preferred habitat for the species.	No

Common Name	Scientific Name	BC Act	EPBC Act	ID Within 10km (ALA)	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
Curlew Sandpiper	*Calidris ferruginea*	E, M	CE, M	N	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.	Unlikely	The Subject Land does not contain preferred habitat for the species.	No.
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	E	N	Tall mountain forests and woodlands - particularly within mature, wet sclerophyll forests, dominated by eucalypts with dense, shrubby acacia and banksia understories, often in secluded valley.	Unlikely	Although the Subject Site has potential habitat, it's unlikely this species would occur, no know records within 10 km.	No.
South-eastern Glossy Black-Cockatoo	*Calyptorhynchus lathami lathami*	V	NL	N	Typically found foraging in Allocasuarinas Sp.and Casuarina sp. And prefers large nesting hollows in Eucalypts forests.	Likely	The Subject Land does not contain preferred habitat for the species.	No.
Grey Falcon	*Falco hypoleucos*	E	NL	N	Timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water also in treeless areas and frequents tussock grassland and open woodland.	Unlikely	Although the Subject Land has potential habitat, it's unlikely this species would occur, no know records within 10 km.	No.
Painted Honeyeater	*Grantiella picta*	V	V	N	Eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, woodlands which contain a higher number of mature trees, as these host more mistletoes.	Fair	The Subject Land contains suitable habitat and contain mistletoe at sufficient densities to provide foraging habitat for the species. There are 2 records within 15 kms of the site.	Yes

Common Name	Scientific Name	BC Act	EPBC Act	ID Within 10km (ALA)	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
Little Eagle	*Hieraaetus morphnoides*	V	NL	Y	Eucalypt forest, woodland or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior.	Moderate	Potential for species to be observed on site foraging or flying over	Yes.
White-throated Needletail	*Hirundapus caudacutus*	NL	V, M	N	Occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings. Mostly aerial.	Unlikely	Potential for species to be observed on site foraging or flying over.	No.
Swift Parrot	*Lathamus discolor*	E	CE	N	Old-growth or other forest with suitable hollows, in relatively close proximity to the main food source, flowering Tasmanian blue gum.	Unlikely	The species has no records within the locality. The Subject Land contains a small number of hollows which may suit the species.	No.
Eastern Curlew, Far Eastern Curlew	*Numenius madagascariensis*	NL	CE, M	N	Sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass.	Unlikely	The Subject Land does not contain preferred habitat for the species.	No.
Superb Parrot	*Polytelis swainsonii*	V	V	N	Typically near a watercourse, they use at least six species of eucalyptus but have a particular reliance on Blakely's red gum E. blakelyi.	Unlikely	Although the Subject Land has potential habitat, it's unlikely this species would occur, no know records within 10 km.	No.
Australian Painted Snipe	*Rostratula australis*	E	E	N	Freshwater wetlands, both ephemeral and permanent, such as lakes, swamps, claypans, inundated or waterlogged grassland/saltmarsh, dams, rice crops, sewage farms and bore drains, generally with a good	Unlikely	The Subject Land does not contain preferred habitat for the species.	No.

Common Name	Scientific Name	BC Act	EPBC Act	ID Within 10km (ALA)	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
					cover of grasses, rushes and reeds, low scrub.			
Masked Owl	*Tyto novaehollandiae*	V	NL	Y	Dry eucalypt forests and woodlands, Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	Moderate	Subject Land lacks trees with hollows greater than 20 cm required for breeding for the species, however suitable habitat for foraging..	Yes.
Reptiles								
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	*Aprasia parapulchella*	V	V	N	Grassland, grassy woodland and woodland communities, and the species usually inhabits sloping sites that contain rocky outcrops or scattered, partially buried rocks.	Unlikely	The Subject Land does not contain preferred habitat for the species.	No.
Striped Legless Lizard, Striped Snake-lizard	*Delma impar*	V	V	N	Native grasslands or grassy woodlands (including derived grasslands) if area retains suitable tussock structure, the soil is of appropriate type and structure, and the site has not had major disturbance such as ploughing.	Unlikely	The Subject Land does not contain preferred habitat for the species, no know records within 10 km.	No.
Border Thick-tailed Gecko, Granite Belt Thick-tailed Gecko	*Uvidicolus sphyrurus*	V	V	N	Granite in the New England area and favours dry eucalypt forest or woodland with boulders, rock slabs, fallen timber and deep leaf litter.	Unlikely	The Subject Land does not contain preferred habitat for the species, no know records within 10 km.	No.
Amphibian								
Booroolong Frog	*Litoria booroolongensis*	E	E	Y	Exclusively along rocky sections of permanent streams in wet and dry forest, woodland, and cleared	Unlikely	The Subject Land does not contain preferred habitat for the species.	No.

Common Name	Scientific Name	BC Act	EPBC Act	ID Within 10km (ALA)	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
					grazed land. The species is reliant on permanent running water.			
Fish								
Murray Cod	*Maccullochella peelii*	NL	V	N	Freshwater water ways with wood debris.	Unlikely	The Subject Land does not contain preferred habitat for the species.	No.
Flora								
Null	*Androcalva procumbens*	V	V	N	Sandy soils, often in disturbed habitats such as road verges, quarry boundaries, gravel stockpiles, and power line easements.	Unlikely	Although the Subject Land may contain preferred habitat for the species, no know records within 10 km.	No.
Ooline	*Cadellia pentastylis*	V	V	N	Dry rainforest, semi-evergreen vine thickets and sclerophyll ecological communities.	Unlikely	The Subject Land does not contain preferred habitat for the species and is outside species distribution area.	No.
Bluegrass	*Dichanthium setosum*	V	V	N	Moderately disturbed areas such as cleared woodland, grassy roadside remnants, grazed land and highly disturbed pasture.	Moderate	Although the Subject Land may contain preferred habitat for the species a targeted survey for this species was undertaken onsite. The survey did not identify the presence of this species on site and only minimal suitable habitat.	No.
Narrow-leaved Peppermint, Narrow-leaved Black Peppermint	*Eucalyptus nicholii*	V	V	N	Grassy or sclerophyll woodland in association with many other eucalypts that grow in the area, including E. andrewsii and many of the stringybarks, such as E. caliginosa	Unlikely	The Subject Land does not contain preferred habitat for the species and is outside species distribution area.	No.

Common Name	Scientific Name	BC Act	EPBC Act	ID Within 10km (ALA)	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
Null	*Euphrasia arguta*	CE	CE	N	Grassy forests or regrowth vegetation.	Unlikely	Although the Subject Land may contain preferred habitat for the species, no know records within 10 km.	No.
Tall Velvet Sea-berry	*Haloragis exalata subsp. velutina*	V	V	N	Damp places near watercourses and in woodland on steep rocky rainforest margins and grasslands.	Unlikely	The Subject Land does not contain preferred habitat for the species and is outside species distribution area.	No.
Spiny Pepper-cress	*Lepidium aschersonii*	V	V	N	Wet sites such as gilgai depressions and the margins of freshwater and saline marshes and shallow lakes, usually on heavy clay soil.	Unlikely	The Subject Land does not contain preferred habitat for the species, no know records within 10 km.	No.
Winged Pepper-cress	*Lepidium monoplocoides*	E	E	N	Open, sparsely vegetated sites in a range of habitats on heavy clay or clay-loam soils, usually on sites that are seasonally flooded or prone to waterlogging, in arid to semi-arid areas.	Unlikely	The Subject Land does not contain preferred habitat for the species and is outside species distribution area.	No.
Rufous Pomaderris, Brown Pomaderris	*Pomaderris brunnea*	E	V	N	Ridgetops and plateaux in relatively dry habitats, and also in moist woodland or forest on clay and alluvial soils of flood plains and creek lines in relatively damp habitats.	Unlikely	The Subject Land does not contain preferred habitat for the species and is outside species distribution area.	No.
a leek-orchid	*Prasophyllum sp. Wybong (C.Phelps ORG 5269)*	NL	CE	N	Open eucalypt woodland and grassland.	Unlikely	Although the Subject Land may contain preferred habitat for the species, no know records within 10 km.	No.
Austral Toadflax, Toadflax	*Thesium australe*	V	V	N	Shrubland, grassland or woodland, often on damp sites of open grassy heath dominated by	Unlikely	Although the Subject Land may contain preferred habitat for the	No.

Common Name	Scientific Name	BC Act	EPBC Act	ID Within 10km (ALA)	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
					Kangaroo Grass grassland surrounded by *Eucalyptus* woodland; and grassland dominated by Barbed-wire Grass.		species, no know records within 10 km.	
Null	*Vincetoxicum forsteri*	V	E	N	Dry scrub, open forest and woodlands associated with Melaleuca uncinata, Eucalyptus fibrosa, E. sideroxylon, and E. albens.	Unlikely	Although the Subject Land may contain preferred habitat for the species, no know records within 10 km.	No.
Migratory								
Curlew Sandpiper	*Calidris ferruginea*	E, M	CE, M	N	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.	Unlikely	The Subject Land does not contain preferred habitat for the species.	No.
White-throated Needletail	*Hirundapus caudacutus*	N L	V, M	N	Occur over most types of habitats, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings. Mostly aerial.	Unlikely	Potential for species to be observed on site foraging or flying over.	No.
Eastern Curlew, Far Eastern Curlew	*Numenius madagascariensis*	N L	CE, M	N	Sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass.	Unlikely	The Subject Land does not contain preferred habitat for the species.	No.

Table 13: Potential occurrence assessment for threatened ecological communities

Community Name	BC Act	EPBC Act	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
Artesian Springs Ecological Community in the Great Artesian Basin	Critically Endangered	-	Occurs where artesian springs emerge at surface through fault lines in the overlying rock.	Unlikely	No artesian springs were recorded on the Subject Land	No.
Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions	Endangered	-	Community characterised by the presence *Acacia harpophylla* throughout the North West Slopes and Plains and Darling River Plains in NSW.	Low	The subject land does not contain the flora community of this TEC	No.
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	Endangered	-	Often occurs upslope of river red gum communities on brown loam or clay alluvial soils. Community dominated by *Eucalyptus conica* with *E. microcarpa* and *E. melliodora.*	Unlikely	The subject land does not contain the flora community of this TEC. The Subject Land does not occur on the appropriate soil type the subject land occurs on the upper slope on red clays. TEC unlikely to occur.	No.
Howell Shrublands in the New England Tableland and Nandewar Bioregions	Endangered	-	Occurs on areas of extensive granite outcropping where the vegetation community is dominated by low shrubs including *Babingtonia densifolia* and *Homoranthus prolixus*.	Unlikely	The subject land vegetation does not conform to the low shrub strata nor does it contain the correct floristics. TEC unlikely to occur.	No.
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain,	Endangered	-	Occurs on fertile soils of western slopes and plains of NSW where rainfall is between 375-800mm. A correlation exists with tertiary and quaternary alluvial Red Brown Earths.	Unlikely	Subject Land does not contain *Eucalyptus microcarpa*. TEC unlikely to occur.	No

Community Name	BC Act	EPBC Act	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
Nandewar and Brigalow Belt South Bioregions						
Mount Kaputar high elevation and dry rainforest land snail and slug community in the Nandewar and Brigalow Belt South Bioregions	Endangered	-	Occurs in habitats with low average temperatures and high rainfall and humidity that support *Eucalyptus pauciflora, E. viminalis, E. dalrympleana, E. volcanica,* and *E. laevopinea* amongst others.	Unlikely	The Subject Land does not contain the correct floristics nor abiotic factors to support the TEC.	No
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	Endangered	-	Occurs on the alluvial pains of the Murray-Darling Basin. Occurs on red-brown earths and heavy grey brown alluvial soils. Community invariably includes *Acacia pendula* as the dominant or only tree species.	Unlikely	Subject land does not occupy the correct landscape position, nor does it support the correct flora community.	No
Native Vegetation on Cracking Clay Soils of the Liverpool Plains	Endangered	-	Native grassland community containing *Austrostipa aristiglumis, Dichanthium sericeum* and *Panicum queenslandicum* occurring on the North West Slopes and Plains of NSW.	Unlikely	The subject land does not conform to the appropriate vegetation strata and does not contain the correct flora community.	No
Semi-evergreen Vine Thicket in the Brigalow Belt South and	Endangered	-	Occurs on soils of high to medium fertility where *Brachychiton* spa reemergent and vine thickets occur.	Unlikely	The subject land does not contain the flora community of this TEC	No.

Community Name	BC Act	EPBC Act	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
Nandewar Bioregions						
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Endangered	Occurs on grey self-mulching clays that are periodically waterlogged.	Unlikely	Subject Land does not occur on the appropriate soil type for this TEC.	No.
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	-	Critically Endangered	Community is strongly reliant on soil type i.e. fine textured often cracking clay derived from basalt or quaternary alluvium. In the Liverpool plains region the community occupies areas with mean rainfall of 550-750 mm.	Unlikely	The Subject Land does not contain preferred soil type or landscape position for the TEC.	No.
Lowland Rainforest of Subtropical Australia	-	Critically Endangered	Typically occurs in areas of high rainfall and in areas more than 2km from the coast. Occurs on basalt and alluvial soils.	Unlikely	The Subject Site does not occur on the correct soil type and does not support the correct flora community for this TEC..	No.
New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands	-	Critically Endangered	Typically occurs on valley flats and lower slopes subject to cold air drainage. Occur on poorly drained loam-clay soil, fine grained sedimentary and acid volcanic substrates or coarse sandy soils overlying granite. Canopy is dominated or co dominated by *Eucalyptus nova-anglica.*	Unlikely	The Subject Land does support the correct flora community for this TEC.	No
Grey Box (Eucalyptus microcarpa) Grassy	-	Endangered	Community occurs on the drier edge of temperate grassy woodland belt of central NSW. The community is	Unlikely	The Subject Land does not support *Eucalyptus microcarpa*.	No

Community Name	BC Act	EPBC Act	Preferred Habitat*	Likelihood	Justification	Significant species Assessment required? Y/N
Woodlands and Derived Native Grasslands of South-eastern Australia			dominated or co dominated by *Eucalyptus microcarpa*.			
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Critically Endangered	The community occurs in NSW North Coast, New England tablelands, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, South Western Slopes and South East Corner and Riverina Bioregions. It is dominated by one or a mixture of *Eucalyptus albens, E. melliodora* or *E. baleklyi* with a high diversity of grasses and herbs.	Likely	The subject land occurs in the correct bioregion and also has the correct canopy species and woodland structure. This TEC occurs on the Subject Land.	**Yes**
Weeping Myall Woodlands	-	Endangered	Occurs on the alluvial pains of the Murray-Darling Basin. Occurs on red-brown earths and heavy grey brown alluvial soils. Community invariably includes *Acacia pendula* as the dominant or only tree species.	Unlikely	Subject land does not occupy the correct landscape position, nor does it support the correct flora community.	No
Poplar Box Grassy Woodland on Alluvial Plains	-	Endangered	The community occurs on a range of soil types of alluvial origins, most common this includes clay, clay-loam, loam or sandy-loam in flat terrain. The canopy is dominated by *Eucalyptus populnea*.	Unlikely	The subject land does not occupy the correct landscape position nor the appropriate soil type. The subject land also does not contain the correct flora species for this TEC.	No

A-4 Biodiversity Conservation Act - Significance Assessment

A-4-1 Koala (*Phascolarctos cinereus*)

BC Act Status: Endangered

EPBC Act Status: Endangered

Distribution and ecology

The koala is a wide-ranging marsupial endemic to Australia. It typically occurs in eastern Australian forests and woodlands of predominantly Eucalyptus species. The koala's distribution is not continuous across this range and it occurs in several subpopulations that are separated by cleared land or unsuitable habitat (Martin and Handasyde 1999; NSW DECC 2008). The koala's distribution includes Queensland, New South Wales, the Australian Capital Territory, Victoria and South Australia. The listed population of the koala has a wide but patchy distribution that spans the coastal and inland areas of Queensland north to the Herberton area, extending westwards into hotter and dryer semi-arid climates of central Queensland, New South Wales and the Australian Capital Territory.

Threats

The koala is threatened by wide-scale climate change drivers which include the increased frequency and intensity of drought and high temperatures, the increasing prevalence of weather conditions which promote bushfire, and a shrinking climatically suitable area (Adams-Hosking et al. 2011; McAlpine et al. 2015; Runge et al. 2021a). Simultaneously, koala populations are also being impacted by diseases, specifically koala retrovirus (KoRV) and Chlamydia (Chlamydia pecorum), human-related activities including habitat loss resulting from land clearance and mining, and mortality due to encounters with vehicles and dogs

Survey Results

Targeted surveys for koalas were not undertaken on the site however habitat surveys did not identify any signs (scats, scratch marks) indicating the presences of koalas on the site. A single record of the species is present within a ten kilometre radius of the subject site. The subject site contains potential habitat for the threatened species.

BC Act Test of Significance

Table 14: BC Act Test of Significance - Koala

Significant Impact Criteria	Details
a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	The proposed development involves removal of approximately 0.05 hectares of vegetation considered suitable habitat for koalas. The species is highly mobile and can travel several kilometres for food sources. This considered, the Development Site represents a minute portion of a much larger foraging range. For this reason, it is not considered possible that the proposed development could lead to a significant impact on a viable local population of the species to the point of placing it at risk of extinction.
b) In the case of an endangered ecological community or critically endangered ecological community,	Not Applicable to this threatened species.

Significant Impact Criteria	Details
whether the proposed development or activity: (i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	
c) In relation to the habitat of a threatened species or ecological community: (i) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.	Habitat to be removed comprises a minor area of vegetation located to minimise clearing impacts. The 0.05 hectares of vegetation represents a minute portion of the habitat available to the koala in the locality. The vegetation proposed to be removed is located adjacent to previously cleared / impacted areas, minimising impacts on connectivity and edge effects. Removal of the vegetation will not impact habitat connectivity and no areas of habitat will become isolated as a result of the proposal. The Development Footprint offers limited potential habitat for the Koala, and this is limited to a minute portion of their potential foraging range within the site and immediate surrounding area. Given the very limited extent of native vegetation to be removed and limitations of the site's habitat, the Koala would be reliant on adjacent and nearby habitats to fulfil their lifecycle requirements and the limited vegetation within the development footprint would not be of any key importance.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposed development will not directly or indirectly affect an area of outstanding biodiversity value for the Koala.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	As per assessed in Section 8.2.1, the proposed development contributes to the following KTP: • Clearing of native vegetation The proposed development may increase the potential impact of the following KTP's on this threatened species, listed under the BC Act: • Anthropogenic Climate Change • Invasion, establishment and spread of Lantana (*Lantana camara*) • Invasion of native plant communities by Bitou Bush & boneseed • Invasion and establishment of exotic vines and scramblers These KTPs have the potential to impact this species by reducing the area of habitat available and potentially cause disease to these species. Recommendations are provided to assist in minimising potential indirect impacts on this threatened species. Given these measures are followed impacts from these KTPs are unlikely.
Conclusion	The proposal will result in the removal up to 0.05 ha of Eucalyptus woodland, potential habitat for the Koala. The proposal is not considered to significantly impact this species due to the following factors: • The extent of native vegetation to be removed is a minute proportion of the extent of foraging and breeding habitat available for this species which exists within the locality. • The proposal will not fragment or isolate any areas of this foraging habitat. • Connectivity will remain unaffected throughout the study area. • The Recommendations have been made to minimise the likelihood of potential impacts of KTPs within the subject site.

Significant Impact Criteria	Details
	• An ecological restoration program has been recommended under the precautionary principle to restore 0.3 ha of eucalypt woodland as the impacted vegetation conforms to a TEC.

A-4-2 Grey-headed Flying-fox (*Pteropus poliocephalus*)

BC Act Status: Vulnerable

EPBC Act Status: Vulnerable

Distribution and ecology

he Grey-headed Flying-fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feeds on commercial fruit crops and on introduced tree species in urban areas. The primary food source is blossom from Eucalyptus and related genera but in some areas it also utilises a wide range of rainforest fruits (Eby 1998). None of the vegetation communities used by the Grey-headed Flying-fox produce continuous foraging resources throughout the year. As a result, the species has adopted complex migration traits in response to ephemeral and patchy food resources (Duncan et al. 1999; Eby 1996, 1998; Nelson 1965a; Parry-Jones & Augee 1992; Spencer et al. 1991).

Threats

Four key threatening processes are identified for the species, outlined on DCCEEW species profile' namely:

- Biological factors – Only one young is produced per year indicating a long survival rate, however survival rate has significantly declined.
- Habitat loss and fragmentation – The species requires a complex habitat based on their movement and foraging behaviour that contains flowering and fruiting trees. Loss of habitat has restricted suitable foraging areas.
- Exploitation – Due to the species regularly feeding on orchards a significant portion of the population is shot each year. This results not only in the direct impact of the loss of the individual but also likely the loss of feeding mothers and as such juveniles within the population due to starvation.
- Competition and hybridisation – there is indirect evidence to suggest the population of Black Headed Flying fox population generally moving south further into historic Grey Headed flying fox habitat. This has resulted in increased competition.
- Pollutants, electrocution and pathogens – Urban populations of the species accumulate lethal levels of pollutants. Additionally electrocution in urban areas results in the death of individuals with a high portion of lactating females being effected.

Survey Results

Targeted surveys for the species were not undertaken on site, however habitat onsite included suitable flowering Eucalyptus, with records of the species occurring within 10 kilometres of the site. It is highly likely that the site would be used by the species for foraging. No roosts or colonies were identified within the site or immediate surrounding area.

BC Act Test of Significance

Table 15: BC Act Test of Significance – Grey Headed Flying Fox

Significant Impact Criteria	Details
a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	The proposed development involves removal of approximately 0.05 hectares of vegetation considered suitable habitat for koalas. The species is highly mobile and can travel several kilometres for food sources. This considered, the Development Site represents a minute portion of a much larger foraging range. For this reason, it is not considered possible that the proposed development could lead to a significant impact on a viable local population of the species to the point of placing it at risk of extinction.
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	Not Applicable to this threatened species.
c) In relation to the habitat of a threatened species or ecological community: (i) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.	Habitat to be removed comprises a minor area of vegetation located to minimise clearing impacts. The 0.05 hectares of vegetation represents a minute portion of the habitat available to the species. Due to the species being highly mobile, removal of the vegetation will not impact habitat connectivity and no areas of habitat will become isolated as a result of the proposal. The Development Footprint offers limited potential habitat for the Grey headed flying fox, and this is limited to a minute portion of their potential foraging range within the site and immediate surrounding area. Given the very limited extent of native vegetation to be removed and limitations of the site's habitat, the Grey Headed Flying fox would be reliant on adjacent and nearby habitats to fulfil their lifecycle requirements and the limited vegetation within the development footprint would not be of any key importance.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposed development will not directly or indirectly affect an area of outstanding biodiversity value for the species.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	As per assessed in Section 8.2.1, the proposed development contributes to the following KTP: • Clearing of native vegetation The proposed development may increase the potential impact of the following KTP's on this threatened species, listed under the BC Act: • Anthropogenic Climate Change • Invasion, establishment and spread of Lantana (*Lantana camara*) • Invasion of native plant communities by Bitou Bush & boneseed • Invasion and establishment of exotic vines and scramblers

Significant Impact Criteria	Details
	These KTPs have the potential to impact this species by reducing the area of habitats available to the species. Recommendations are provided to assist in minimising potential indirect impacts on this threatened species. Given these measures are followed impacts from these KTPs are unlikely.
Conclusion	The proposal will result in the removal up to 0.05 ha of Eucalyptus woodland, potential habitat for the Koala. The proposal is not considered to significantly impact this species due to the following factors: • The extent of native vegetation to be removed is a minute proportion of the extent of foraging and breeding habitat available for this species which exists within the locality. • The proposal will not fragment or isolate any areas of this foraging habitat. • Connectivity will remain unaffected throughout the study area. • The Recommendations have been made to minimise the likelihood of potential impacts of KTPs within the subject site. • An ecological restoration program has been recommended under the precautionary principle to restore 0.3 ha of eucalypt woodland as the impacted vegetation conforms to a TEC.

A-4-4 Painted Honeyeater (Grantiella picta)

BC Act Status: Vulnerable

EPBC Act Status: Vulnerable

Distribution and ecology

The species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. The greatest concentrations and almost all records of breeding come from inland slopes of the Great Dividing Range between the Grampians, Victoria and Roma, Queensland. Grantiella picta (painted honeyeater). The species exhibits seasonal north-south movements governed principally by the fruiting of mistletoe, with which its breeding season is closely matched (Barea and Watson, 2007). Many birds move after breeding to semi-arid regions such as north-eastern South Australia, central and western Queensland, and central Northern Territory

The species inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips

Threats

Habitat loss is a key threat to this species. Much of its breeding habitat has been cleared or has been reduced to ageing, widely-spaced trees, particularly in box-ironbark and boree woodlands. In the breeding strongholds of south-eastern Australia, woodlands are being cleared at a greater rate than they are being restored. In particular, regrowth woodland, which contains similar or higher densities of mistletoe than remnant woodland, is viewed as having little conservation value and is being cleared at an unsustainable rate

Survey Results

Diurnal bird surveys were undertaken on site, with the species not recorded onsite. Habitat onsite included mistletoes occurring in eucalyptus woodland, with records of the species occurring within 10 kilometres of the site.

BC Act Test of Significance

Table 16: BC Act Test of Significance – Painted Honeyeater

Significant Impact Criteria	Details
a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	The proposed development involves removal of approximately 0.05 hectares of vegetation considered suitable habitat for the painted Honeyeater, that contained some Mistletoe. The species is highly mobile and can travel several kilometres for food sources. This considered, the Development Site represents a minute portion of a much larger foraging range. For this reason, it is not considered possible that the proposed development could lead to a significant impact on a viable local population of the species to the point of placing it at risk of extinction.
b) In the case of an endangered ecological community or critically endangered ecological community,	Not Applicable to this threatened species.

Significant Impact Criteria	Details
whether the proposed development or activity: (i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	
c) In relation to the habitat of a threatened species or ecological community: (i) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.	Habitat to be removed comprises a minor area of vegetation located to minimise clearing impacts. The 0.05 hectares of vegetation represents a minute portion of the habitat available to the species. Due to the species being highly mobile, removal of the vegetation will not impact habitat connectivity and no areas of habitat will become isolated because of the proposal. The Development Footprint offers limited potential habitat for the Painted Honeyeater, and this is limited to a minute portion of their potential foraging range within the site and immediate surrounding area. Given the very limited extent of native vegetation to be removed and that the site does not occur within the known breeding areas of the species the species would be reliant on adjacent and other habitats to fulfil their lifecycle requirements and the limited vegetation within the development footprint would not be of any key importance to the survival of the population.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposed development will not directly or indirectly affect an area of outstanding biodiversity value for the species.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The proposed development contributes to the following KTP: • Clearing of native vegetation The proposed development may increase the potential impact of the following KTP's on this threatened species, listed under the BC Act: • Anthropogenic Climate Change • Invasion and establishment of exotic vines and scramblers These KTPs have the potential to impact this species by reducing the area of habitats available to the species. Recommendations are provided to assist in minimising potential indirect impacts on this threatened species. Given these measures are followed impacts from these KTPs are unlikely.
Conclusion	The proposal will result in the removal up to 0.05 ha of Eucalyptus woodland, potential habitat for the Painted Honeyeater. The proposal is not considered to significantly impact this species due to the following factors: • The extent of native vegetation to be removed and available food source (mistletoe) is a minute proportion of the extent of foraging and breeding habitat available for this species which exists within the locality. • The proposal will not fragment or isolate any areas of this foraging habitat. • Connectivity will remain unaffected throughout the study area. • The Recommendations have been made to minimise the likelihood of potential impacts of KTPs within the subject site. • An ecological restoration program has been recommended under the precautionary principle to restore 0.3 ha of eucalypt woodland as the impacted vegetation conforms to a TEC.

A-4-5

A-4-6 Little Eagle (*Hieraaetus morphnoides*) and Masked Owl (*Tyto novaehollandiae*)

BC Act Status: Vulnerable

EPBC Act Status: Not listed

Distribution and ecology

Little Eagle

The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW

- Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used.
- Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.

Masked Owl

Masked Owls populations extend from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution

- Lives in dry eucalypt forests and woodlands from sea level to 1100 m.
- A forest owl, but often hunts along the edges of forests, including roadsides.
- The typical diet consists of tree-dwelling and ground mammals, especially rats.
- Pairs have a large home-range of 500 to 1000 hectares.
- Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.

Threats

Little Eagle

- Secondary poisoning from rabbit baiting
- Clearing and degradation of foraging and breeding habitat

Masked Owl

- Loss of mature hollow-bearing trees and changes to forest and woodland structure, which leads to fewer such trees in the future.
- Clearing of habitat for grazing, agriculture, forestry or other development.
- A combination of grazing and regular burning is a threat, through the effects on the quality of ground cover for mammal prey, particularly in open, grassy forests.
- Secondary poisoning from rodenticides.
- Being hit by vehicles.

Survey Results

Diurnal bird surveys were undertaken on site, with neither species recorded onsite. Foraging habitat for both species occurs on site however breeding habitat for these species was not identified on site. Records of both species occur within 10 kilometres of the site.

BC Act Test of Significance

Table 17: BC Act Test of Significance – Little Eagle and Masked Owl

Significant Impact Criteria	Details
a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	The proposed development involves removal of approximately 0.05 hectares of vegetation considered suitable foraging habitat for these species. These species is highly mobile and can travel several kilometres for prey. This considered, the Development Site represents a minute portion of a much larger foraging range. For this reason, it is not considered possible that the proposed development could lead to a significant impact on a viable local population of the species to the point of placing it at risk of extinction.
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	Not Applicable to this threatened species.
c) In relation to the habitat of a threatened species or ecological community: (i) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.	Habitat to be removed comprises a minor area of vegetation located to minimise clearing impacts. The 0.05 hectares of vegetation represents a minute portion of the habitat available to the species. Due to the species being highly mobile, removal of the vegetation will not impact habitat connectivity and no areas of habitat will become isolated because of the proposal. The Development Footprint offers limited potential foraging habitat for the species, and this is limited to a minute portion of their potential foraging range within the site and immediate surrounding area. Given the very limited extent of native vegetation to be removed and that the site does not contain suitable breeding habitats / areas for the species the species would be reliant on adjacent and other habitats to fulfil their lifecycle requirements and the limited vegetation within the development footprint would not be of any key importance to the survival of the population.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposed development will not directly or indirectly affect an area of outstanding biodiversity value for the species.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The proposed development contributes to the following KTP: • Clearing of native vegetation The proposed development may increase the potential impact of the following KTP's on this threatened species, listed under the BC Act:

Significant Impact Criteria	Details
	• Anthropogenic Climate Change • Invasion, establishment and spread of Lantana (*Lantana camara*) These KTPs have the potential to impact this species by reducing the area of habitats available to the species. Recommendations are provided to assist in minimising potential indirect impacts on this threatened species. Given these measures are followed impacts from these KTPs are unlikely.
Conclusion	The proposal will result in the removal up to 0.05 ha of Eucalyptus woodland, potential foraging habitat for the species. The proposal is not considered to significantly impact this species due to the following factors: • The extent of native vegetation to be removed and available foraging area is a minute proportion of the extent of foraging habitat available for this species which exists within the locality. • The proposal will not fragment or isolate any areas of this foraging habitat. • Connectivity will remain unaffected throughout the study area. • The Recommendations have been made to minimise the likelihood of potential impacts of KTPs within the subject site. • An ecological restoration program has been recommended under the precautionary principle to restore 0.3 ha of eucalypt woodland as the impacted vegetation conforms to a TEC.

A-4-7 White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland

BC Act Status: Critically Endangered

EPBC Act Status: Critically Endangered

Distribution and ecology

Box – Gum Grassy Woodland is an ecological community that occurs along the western slopes and tablelands of the Great Dividing Range from southern Queensland through to NSW and the ACT to central Victoria (Beadle 1981). The community is characteries by the presence or prior presence of White Box, Yellow Box and/or Blakely's Red Gum and a grassy understory. Trees may exist in pure stands or in mixtures with other trees. Sites on fertile soils in the lower landscape support large trees with hollows and fallen timber

Threats

Box – Gum Grassy Woodland TEC is still subject to ongoing threats. These include further clearing, deterioration of remnant condition and degradation of the landscape in which remnants occur. While these threats are currently demonstratable there is a like of data to describe the degree of these threats occurring across remaining patches of the TEC.

Survey Results

The subject land supported a community dominated by the appropriate key diagnostic species for this TEC. This included *Eucalyptus albens* and *E. blakelyi.* This TEC was deemed to occur on the subject land in moderate and low condition.

BC Act Test of Significance

Table 18: BC Act Test of Significance – White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derive Native Grassland.

Significant Impact Criteria	Details
a) In the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	Not applicable to this ecological community.
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	The proposed development intends to clear 0.05 ha of the 7.6 ha of the Box-Gum Grassy Woodland recorded on the subject land. This is a minute portion of what exists on the Subject Land and is degraded due to edge effects. Despite the minute size of intended clearing area a 0.3 ha rehabilitation area has been proposed which would have a net gain in area of the TEC once it is established. This considered it is likely that the proposed ameliorative measures will increase the quality of the TEC on s=the subject land.

Significant Impact Criteria	Details
c) In relation to the habitat of a threatened species or ecological community: (i) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.	The proposed action will result in the removal of 0.05 hectares of the TEC, however the location of the loss is along existing cleared edges resulting in no fragmentation and minimising connectivity reductions. In addition, the rehabilitation area will increase connectivity of vegetation on the subject land and will likely increase the chances of the long term survival on the subject land.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	There where no mapped areas of outstanding biodiversity value on the subject land.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	As per assessed in Section 8.2.1, the proposed development contributes to the following KTP: • Clearing of native vegetation The proposed development may increase the potential impact of the following KTP's on this threatened species, listed under the BC Act: • Anthropogenic Climate Change • Invasion, establishment and spread of Lantana (*Lantana camara*) • Invasion of native plant communities by Bitou Bush & boneseed • Invasion and establishment of exotic vines and scramblers These KTPs have the potential to impact this threatened community by introducing previously absent exotic species. Recommendations are provided to establish a rehabilitation area to increase the area of TEC on the subject land. A weed control program will also reduce the risk of the above mention exotic species from reducing the quality of the TEC..
Conclusion	The proposal will result in the removal up to 0.05 ha of Bx-Gum Grassy Woodland TEC. The proposal is not considered to significantly impact this species due to the following factors: • The extent of native vegetation to be removed is a minute proportion of the extent of the community on the subject land and surrounding locality. • The proposal will not fragment or isolate any areas of this foraging habitat. • Connectivity will improve with the establishment of the rehabilitation area. • The Recommendations have been made to minimise the likelihood of potential impacts of KTPs within the subject site. • An ecological restoration program has been recommended under the precautionary principle to restore 0.3 ha of eucalypt woodland as the impacted vegetation conforms to a TEC.

A-5 EPBC Significant Impact Assessment

Protected Species Assessments

The guidelines to assessment of significance to this Matter, define an action is as likely to have a significant impact: on a Vulnerable species, if it will:

a) Lead to a long-term decrease in the size of an important population of a species, or:

b) Reduce the area of occupancy of an important population, or:

c) Fragment an existing important population into two or more populations, or:

d) Adversely affect habitat critical to the survival of a species, or:

e) Disrupt the breeding cycle of an important population, or:

f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline, or:

g) Result in invasive species, which are harmful (by competition, modification of habitat, or predation) to a Vulnerable species, becoming established in the Vulnerable species' habitat, or:

h) Introduce a disease that may cause a species to decline, or:

i) Interferes substantially with the recovery of the species.

An assessment of significance of the proposal on the below species is as follows:

- Grey-headed Flying Fox, and
- Painted Honeyeater

Assessment of Significance: Grey-headed Flying Fox (*Pteropus poliocephalus*)

EPBC Act Status: Vulnerable

Table 19: Grey Headed Flying Fox - Key Species Information

Item	Description
Distribution	The Grey-headed Flying Fox is known to occupy areas on the coastal belt from Rockhampton in central Queensland to as far south as Melbourne in Victoria. This species selectivity forages based on food availability, resulting in only a small portion of their range being occupied at any given time and a large variability in occurrence patterns between seasons and years (DEE 2019b). As a result, population statistics are hard to estimate and have not been undertaken since 2005.
Threats	Habitat loss and fragmentation is the key existing threat to this species with an increasing loss in foraging resources and loss or destruction of breeding habitats. As foraging resources become less available, the Grey-headed Flying Fox is forced to find alternate food sources, often being fruit crops and urban areas. These areas pose a greater mortality risk to this species with culling by crop farmers, electrocution and poison more prevalent in these areas (DEE 2019b).
Survey Results	This species was not observed on site, however there are records of the species within 20 km's of the site.

Important Population Assessment	The Grey-headed Flying Fox population potentially utilising the subject site is not considered to represent an *important population* of this species. No breeding colonies are currently located within the locality and numerous colonies present within the region.

Table 20: Significant impact assessment - Grey-headed Flying Fox

Significant Impact Criteria	Details
a) Lead to a long-term decrease in the size of an important population of a species	The proposal will require the removal of 0.05 hectares of potential foraging habitat. This vegetation to be removed occurs in a fragmented area historically cleared for agriculture and gravel extraction and is largely surrounded by cleared pasture and agriculture. This likely provides an extremely small nectar resource for the population relative to its ecological requirements and local extent of potential habitat. While in very strict terms a negative effect, this loss will have a very minor impact on the local Grey-headed Flying Fox populations as the site in total would only form a very minute fraction of this species wider opportunistic/seasonally variable foraging range. The proposed Action will thus not lead to a long-term decrease in the size of these important populations.
b) Reduce the area of occupancy of an important population	The minor loss of foraging habitat on the subject site is insignificant relative to the area of occupancy which is measured in terms of hundreds of thousands of hectares. Consequently, the proposal would not reduce the area of occupancy of the important population.
c) Fragment an existing important population into two or more populations	The Grey-headed Flying Fox is highly mobile and known to be capable of crossing human-modified habitat. The proposal will offer no barrier to movement. Thus, it will not fragment an existing important population.
d) Adversely affect habitat critical to the survival of a species	The vegetation on site is not considered critical habitat for the Grey-headed Flying Fox. Post-development, the remainder of the site and other habitats in the locality will retain the potential to support this species, hence helping support the viability of the local population.
e) Disrupt the breeding cycle of an important population	The habitat in the site to be removed does not contain an important population of this species and does not represent potential breeding habitat. The removal of this habitat would hence not be capable of disrupting the breeding cycle of the Grey-headed Flying Fox.
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The degree of vegetation loss imposed by the proposed development is not significant enough to affect a local population of the Grey-headed Flying Fox to the point that it could cause a decline of the species.
g) Result in invasive species, that are harmful (by competition, modification of habitat, or predation) to a Vulnerable species, becoming established in the Vulnerable species' habitat	No new species that affects the Grey-headed Flying Fox is likely to be introduced as a direct result of the proposal.
h) Introduce a disease that may cause a species to decline	No disease that poses a potential risk to this species is likely to be introduced to the site.
i) Interferes substantially with the recovery of the species	Ideally, the goal in threatened species recovery is to increase the abundance and range of the threatened species, so that it is not in risk of becoming extinct. The proposal will result in the removal of a relatively minute area of foraging habitat for the Grey-headed Flying Fox that is not significant enough to interfere with their recovery.

Significant Impact Criteria	Details
Resulting Impact	**No significant impact**

The Grey-headed Flying Fox populations potentially utilising the subject site is not considered to represent an *important population* of this species. No breeding colonies are currently located within the locality and no records occur within close proximity of the study site. The subject site is also not located within the limit of this species' range.

The above assessment has determined that the proposal is not considered likely to have a significant impact on the Grey-headed Flying Fox. Referral to the DAWE is not required for this species

Assessment of Significance: Painted Honey Eater (*Grantiella picta)*

EPBC Act Status: Vulnerable

Table 21: Painted Honey Eater - Key Species Information

Item	Description
Distribution	The species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. The greatest concentrations, and almost all records of breeding come from south of 26ºS, on inland slopes of the Great Dividing Range between the Grampians, Victoria and Roma, Queensland (Higgins et al., 2001). The species exhibits seasonal north-south movements governed principally by the fruiting of mistletoe, with which its breeding season is closely matched (Barea and Watson, 2007). Many birds move after breeding to semi-arid regions such as north-eastern South Australia, central and western Queensland, and central Northern Territory. Considering its dispersive habits, the species is considered to have a single population (Garnett et al., 2011).
Threats	This species was not observed onsite and no records of the species within 10 km were identified, however 2 records were identified within 15 km's of the site. The site contained preferred food resource (mistletoe) and is considered to have a fair likelihood to occur onsite.
Survey Results	While this species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory, the species is considered to have a single population that predominantly breed along the inland slopes of the Great Dividing Range. As such the single population is considered an important population
Important Population Assessment	Habitat loss is a key threat to this species. Much of its breeding habitat has been cleared or has been reduced to ageing, widely-spaced trees, particularly in box-ironbark and boree woodlands. Its non-breeding habitat is also still being cleared for agriculture (Barea, 2008a). Some acacia and casuarina woodlands (e.g. brigalow and buloke), in which the species occurs, have been heavily cleared and degraded to the extent that they are now nationally endangered ecological communities (DotE, 2015; Garnett et al., 2011)

Table 22: Significant impact assessment – Painted Honey Eater

Significant Impact Criteria	Details
a) Lead to a long-term decrease in the size of an important	The Action will require the removal of 0.05 hectares of potential foraging habitat observed within the site. This likely provides an extremely small foraging resource for the population relative to its ecological requirements and local extent of potential habitat. While in very strict

Significant Impact Criteria	Details
population of a species	terms a negative effect, this loss will have a very minor impact on the foraging populations as the site, in total, would only form a very minute fraction of this species wider opportunistic/seasonally variable foraging range and an even minor food availability impact due to minimal mistletoe on site. The proposal will thus not lead to a long-term decrease in the size of the important populations.
b) Reduce the area of occupancy of an important population	The minor loss of foraging habitat on the subject site is insignificant relative to the area of occupancy which is measured in terms of hundreds of thousands of hectares. Consequently, the proposal would not reduce the area of occupancy of the important population.
c) Fragment an existing important population into two or more populations	The Painted Honey Eater is highly mobile and known to be capable of crossing human-modified habitat. The proposal will offer no barrier to movement. Thus, it will not fragment an existing important population.
d) Adversely affect habitat critical to the survival of a species	The vegetation on site is not considered critical habitat for the species. Post-development, the remainder of the site and other habitats in the locality will retain the potential to support this species, hence helping support the viability of the local population.
e) Disrupt the breeding cycle of an important population	The habitat on site may is of low quality as a food source. Removal of this food source in respect to the species foraging areas in miniscule and will not impact the breeding cycle of the population.
f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The degree of vegetation loss imposed by the proposed development is not significant enough to affect a local population of the Painted Honey Eater to the point that it could cause a decline of the species. The main impact on the species is the loss of breeding habitat on the western side of the Great Dividing Range and foraging habitat consisting of habitat with significant mistletoe populations.
g) Result in invasive species, that are harmful (by competition, modification of habitat, or predation) to a Vulnerable species, becoming established in the Vulnerable species' habitat	No new species that affects the Painted Honey Eater is likely to be introduced as a direct result of the proposal.
h) Introduce a disease that may cause a species to decline	No disease that poses a potential risk to this species is likely to be introduced to the site.
i) Interferes substantially with the recovery of the species	Ideally, the goal in threatened species recovery is to increase the abundance and range of the threatened species, so that it is not in risk of becoming extinct. The proposal will result in the removal of a relatively minute area of foraging habitat (minimal mistletoe) for the Painted Honey Eater that is not significant enough to interfere with their recovery.
Resulting Impact	**No significant impact**

The above assessment has determined that the proposal is not considered likely to have a significant impact on the Painted Honey Eater. Referral to the DAWE is not required for this species.

Assessment of Significance: Koala (*Phascolarctos cinereus)*

EPBC Act Status: Critically Endangered

Table 23: Key Species Information – Koala

Species	Distribution Description
Distribution	The koala is a wide-ranging marsupial endemic to Australia. It typically occurs in eastern Australian forests and woodlands of predominantly Eucalyptus species. Its historical range extends over 22° of latitude and 18° of longitude (Martin & Handasyde 1999). The koala's distribution is not continuous across this range, and it occurs in several subpopulations that are separated by cleared land or unsuitable habitat (Martin and Handasyde 1999; NSW DECC 2008). The koala's distribution includes Queensland, New South Wales, the Australian Capital Territory, Victoria and South Australia. The listed population of the koala has a wide but patchy distribution that spans the coastal and inland areas of Queensland north to the Herberton area, extending westwards into hotter and dryer semi-arid climates of central Queensland, New South Wales and the Australian Capital Territory. For the listed population of koalas in Queensland, New South Wales and the Australian Capital Territory, extent of occurrence (EOO), the area encompassing all known occurrences of a species across its range (IUCN 2019), is estimated to be 1,665,850 km2. This figure is based on the mapping of point records from a 20-year period (2000–2020) obtained from state governments, museums and CSIRO. The EOO was calculated using a minimum convex hull, based on the IUCN Red List Guidelines (DAWE, 2020). During the 2019-2020 bushfire season an estimated 9 percent (>36,800 km2) of the koala's distribution was impacted by fire (DAWE 2021a). This agrees with estimates generated by the NESP Threatened Species Recovery Hub of 9-11.4 percent.
Threats	The koala is threatened by wide-scale climate change drivers which include the increased frequency and intensity of drought and high temperatures, the increasing prevalence of weather conditions which promote bushfire, and a shrinking climatically suitable area (Adams-Hosking et al. 2011; McAlpine et al. 2015; Runge et al. 2021a). Simultaneously, koala populations are also being impacted by diseases, specifically koala retrovirus (KoRV) and Chlamydia (Chlamydia pecorum), human-related activities including habitat loss resulting from land clearance and mining, and mortality due to encounters with vehicles and dogs. These threats can also act synergistically. For example, habitat clearance and climate change drivers are associated with increased levels of physiological stress in wild koala populations (Narayan 2019).
Survey Results	The field survey did not identify the presence of koalas on site, however there is a record within 10 km's of the site and suitable habitat occurs on the site.
Important Population Assessment	Queensland and New South Wales populations north of the Clarence River Valley is considered one of four spatially distinct koala management units based on connectivity. Under the Nature Conservation Act (1992) the Queensland government has identified priority areas for management actions to achieve the highest likelihood of conservation outcomes for koalas in Southeast Queensland. This has included prioritising koalas located in high quality habitat with a high likelihood of successful threat management (DES 2020). These areas are mapped as High-Quality Koala Habitat Areas within Koala Priority Areas. The site is mapped as containing Koala habitat however it is outside the Koala Priority Area indicating the site is outside of the area containing a koala population with a high likelihood of minimising threat management.

Table 24: Significant impact assessment – Koala

Significant Impact Criteria	Details
Will the Action lead to a long-term decrease in the size of a population	The proposed development will result in the removal of 0.05 hectares of koala habitat. This vegetation to be removed occurs in a fragmented area historically cleared for agriculture and quarry activities and is largely surrounded cleared agriculture. The proposed development will result is the loss of a minor area of habitat associated with a patchy network of koala habitat within the local area. The total area of habitat to be removed is not expected to result in long term decrease in the size of the population.
Will the Action reduce the area of occupancy of the species	The proposed development will result in the removal of 0.05 hectares of koala habitat. The proposed development will not result in the reduced area of occupancy as movement corridors between patches of habitat within the surrounding area will not be impacted however it will reduce a minor area of available habitat.
Will the Action fragment an existing population into two or more populations	Fragmentation of the population through the removal of critical movement corridors will not occur.
Will the Action adversely affect habitat critical to the survival of a species	The proposed development will remove a total of 0.05 hectares of koala habitat. As such the Action is not identified as adversely impacting habitat critical to the survival of the species.
Will the Action disrupt the breeding cycle of a population	THe proposed development will not disrupt the breeding cycle of the population. The Action will not significantly impact koala movement, available habitat or breeding areas to the degree to disrupt the breeding cycle.
Will the Action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed development will destroy and decrease the available quantity of habitat for the Koala. The minor area to be removed (0.05 hectares) in context of the surrounding available habitat is unlikely to cause a decline in the species population.
Will the Action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	The proposed Action will not result in the invasion of invasive species.
Will the Action introduce disease that may cause the species to decline, or	No disease that poses a potential risk to this species is likely to be introduced to the site.
Will the Action interfere with the recovery of the species.	The proposed development will result in the removal of 0.05 Koala habitat in an area of a patchwork of available habitat.
Resulting Impact	**No significant impact – recommend submission to DAWE for confirmation.**

The above assessment identifies that the Action will result in the removal of 0.05 hectares of Koala habitat and the proposed development is unlikely to have a significant impact.

Assessment of Significance: White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland -

EPBC Act Status: Critically Endangered

Table 25: Key Threatened Community Information – White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Species	Distribution Description
Distribution	Box–Gum Grassy Woodland is an ecological community that occurs along the western slopes and tablelands of the Great Dividing Range from southern Queensland through NSW and the ACT to central Victoria (Beadle 1981). Further investigation is required regarding the existence of the listed community in South Australia
Survey Results	A total of 7.6 hectares of this TEC was confirmed onsite. The condition of the TEC varied however an assessment of the site based on Appendix 2 of *National Recovery Plan, White Box - Yellow Box - Blakely's Red Gum, Grassy Woodland and Derived Native Grassland A critically endangered Community* (Department of Environment, Climate Change and Water NSW. 2010) confirmed the community on site.

Table 26: Significant impact assessment – White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Significant Impact Criteria	Details
Will the Action reduce the extent of an ecological community	The proposed action will result in the removal of 0.05 hectares of degraded TEC, however onsite rehabilitation will result in reestablishment of additional 0.3 ha of the community and improve the quality of the existing vegetation by weed control and replanting of canopy and understory vegetation. The proposed development is expected to result in a net gain of the community after rehabilitation of degraded areas.
Will the Action fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The proposed action will result in the removal of 0.05 hectares of the TEC, however the location of the loss is along existing cleared edges resulting in no fragmentation and minimising connectivity reductions.
Will the Action adversely affect habitat critical to the survival of an ecological community	The project is not expected to adversely affect habitat critical to the survival of this community. Management of the site will result in improved values of the community overall.
Will the Action modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	The Action will not result in the modification of the existing environment including alterations to water and drainage patterns that a will result in loss of the TEC.
Will the Action cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	No, the Action will not cause a change in composition or cause the loss of function.

Significant Impact Criteria	Details
Will the Action cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: – assisting invasive species, that are harmful to the listed ecological community, to become established, or – causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or	No, the Action will not result in an increase in invasive species or the mobilisation of contaminates which may kill the community. Management actions will be undertaken to improve the ecological condition of the TEC.
Will the Action interfere with the recovery of an ecological community.	No, the Action will not interfere with the recovery of the TEC. Management actions are proposed to improve the quality of the TEC occurring onsite..
Resulting Impact	**No significant impact**

The above assessment identifies that the proposed development will result in the removal of 0.05 hectares of TEC. However the ecological restoration of the a degraded are of the site is expected to increase the area and improve the current condition of the TEC on the Subject Land. The proposed development is highly unlikely to have a significant impact.

A-6 EPBC MNES Search Results

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 14-Sep-2022

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	3
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	8
Listed Threatened Species:	36
Listed Migratory Species:	12

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	19
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	7
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	2
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	900 - 1000km upstream from Ramsar site	In feature area
Riverland	900 - 1000km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	1100 - 1200km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities			[Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community may occur within area	In feature area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area	In buffer area only
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community likely to occur within area	In feature area
New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands	Critically Endangered	Community may occur within area	In buffer area only
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community may occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community may occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat may occur within area	In buffer area only
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Numenius madagascariensis](#)			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
[Polytelis swainsonii](#)			
Superb Parrot [738]	Vulnerable	Species or species habitat may occur within area	In feature area
[Rostratula australis](#)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			
[Maccullochella peelii](#)			
Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
FROG			
[Litoria booroolongensis](#)			
Booroolong Frog [1844]	Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
[Chalinolobus dwyeri](#)			
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Dasyurus maculatus maculatus (SE mainland population)](#)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
[Nyctophilus corbeni](#)			
Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Petauroides volans](#)			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area	In buffer area only
[Petaurus australis australis](#)			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
Androcalva procumbens			
[87153]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cadellia pentastylis			
Ooline [9828]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Dichanthium setosum			
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus nicholii			
Narrow-leaved Peppermint, Narrow-leaved Black Peppermint [20992]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Euphrasia arguta			
[4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Haloragis exalata subsp. velutina			
Tall Velvet Sea-berry [16839]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lepidium aschersonii			
Spiny Pepper-cress [10976]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium monoplocoides			
Winged Pepper-cress [9190]	Endangered	Species or species habitat may occur within area	In buffer area only
Pomaderris brunnea			
Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Prasophyllum sp. Wybong (C.Phelps ORG 5269)			
a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Thesium australe			
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Vincetoxicum forsteri listed as Tylophora linearis			
[92384]	Endangered	Species or species habitat may occur within area	In feature area
REPTILE			
Aprasia parapulchella			
Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In feature area
Delma impar			
Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area	In feature area
Uvidicolus sphyrurus			
Border Thick-tailed Gecko, Granite Belt Thick-tailed Gecko [84578]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus			
White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Monarcha melanopsis			
Black-faced Monarch [609]		Species or species habitat may occur within area	In buffer area only
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat likely to occur within area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat likely to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Telstra Corporation Limited [12935]	NSW	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat may occur within area overfly marine area	In buffer area only
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Ardglen Quarry extension	2007/3442	Controlled Action	Post-Approval	In buffer area only
Queensland Hunter Gas Pipeline, approximately 825 km in length	2008/4483	Controlled Action	Completed	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Liverpool Range Wind farm	2005/2296	Not Controlled Action	Completed	In buffer area only
Queensland Hunter Gas Pipeline, approximately 833 km in length	2008/4620	Not Controlled Action	Completed	In buffer area only
Willow Tree Quarry, NSW	2017/8020	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Aerial baiting for wild dog control	2006/2713	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Bioregional Assessments			
SubRegion	BioRegion	Website	Buffer Status
Hunter	Northern Sydney Basin	BA website	In buffer area only
Namoi	Northern Inland Catchments	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

Department of Agriculture Water and the Environment
GPO Box 858
Canberra City ACT 2601 Australia
+61 2 6274 1111