Koala Assessment Report

Erith Street, Bundanoon

Report prepared by Narla Environmental Pty Ltd

for Civil Development Solutions on behalf of R.G. Capital

March 2023

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Report Certification

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Document Control

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Acronym/ Term	Definition
BC Act	New South Wales Biodiversity Conservation Act 2016.
Core Koala habitat	core Koala habitat means— (a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or (b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.
DA	Development Application.
DPE	New South Wales Department of Planning and Environment (now DPE)
DPIE	New South Wales Department of Planning, Industry and Environment (now DPE)
EP&A Act	Environmental Planning & Assessment Act 1979.
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999.
Highly Suitable Koala Habitat	Where 15% or greater of the total number of trees within any Plant Community Type (PCT) are the regionally relevant species of those listed in Schedule 3 of the SEPP.
Impact Area	Area that is being directly impacted by the proposed development.
KAR	Koala Assessment Report
KMA	Koala Management Area. These are the regions listed in the Schedules of the SEPP and were derived from the Koala Tree Species Index as part of the Koala Habitat Information Base. Sometimes also referred to as Koala Modelling Region (KMR).
KPoM	Koala Plan of Management.
LGA	Local Government Area.
LLS Act	Local Land Services Act 2013.
Site Area	Includes both the impact area and the surrounding areas within the Subject Property. The controls within the SEPP apply to both direct and indirect impacts and all potential habitat on the Site Area therefore needs to be considered even if no vegetation is to be cleared.
Subject Property	Erith Street Bundanoon NSW 2578 (Lots 11 and 18/DP 1219744)
Suitably qualified and experienced person	Suitably qualified and experienced person means a person who has— (a) a tertiary qualification in ecology, environmental management, forestry or other equivalent qualifications, and (b) experience in flora and fauna identification, survey and management, including experience in conducting Koala surveys in accordance with the techniques specified in the Guideline.

1. Introduction

1.1 Change in Threatened Status for Koalas

It is acknowledged that in 2022, the status of Koalas changed from "Vulnerable" to "Endangered" under both the NSW Biodiversity Conservation (BC) Act 2016 and the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999. The findings of this report are still considered valid despite this change.

1.2 State Environmental Planning Policy (Biodiversity and Conservation) 2021: Chapter 4 – Koala Habitat Protection 2021

Chapter 4 of the State Environmental Planning Policy (Biodiversity and Conservation) 2021 (the SEPP) aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline. The SEPP is made under the Environmental Planning and Assessment Act 1979 (EP&A Act) and in-part replaces the previous State Environmental Planning Policy (Koala Habitat Protection) 2021.

The aim of the policy will be achieved by:

- defining what constitutes core Koala habitat;
- outlining the circumstances where a consent authority must have regard to the matters set out in the guideline;
- encouraging the development of Koala Plans of Management (KPoMs). These plans provide the best opportunity to deliver strategic conservation outcomes for Koala populations in NSW. They play a critical role in helping to understand Koala values at a landscape scale and avoiding the types of issues that can arise through site-based, incremental impacts, such as the loss of important habitat linkages, or intensifying land use within areas that are likely to lead to population decline; and
- requiring that a consent authority's determination of a development application is consistent with a KPoM or Part 4.9 of the SEPP where there is no KPoM.

1.3 Nature of the Proposed Development

Narla Environmental Pty Ltd (Narla) was commissioned by Civil Development Solutions on behalf of R.G. Capital ('the proponent') to undertake a Koala Assessment Report (KAR) to accompany a Development Application for the proposed subdivision at Erith Street Bundanoon NSW 2578 (Lots 11 and 18/DP 1219744; hereafter referred to as the 'Site Area; **Figure 1**). The proposed subdivision will involve the creation of building envelopes, a driveway, 1m subdivision fencing buffer, drainage and sewerage systems as well as additional tree removal and Asset Protection Zones (APZ ; Inner and Outer Protection Areas, including in the proposed 88b easement). All areas of the proposed subdivision area collectively referred to as the 'Impact Area' (**Figure 1**).

Narla have produced this report in order to assess any potential impacts associated with the proposed subdivision on Koalas and/or Koala habitat. The report will focus on appropriate measures to mitigate any potential impacts in line with Chapter 4 of the SEPP.

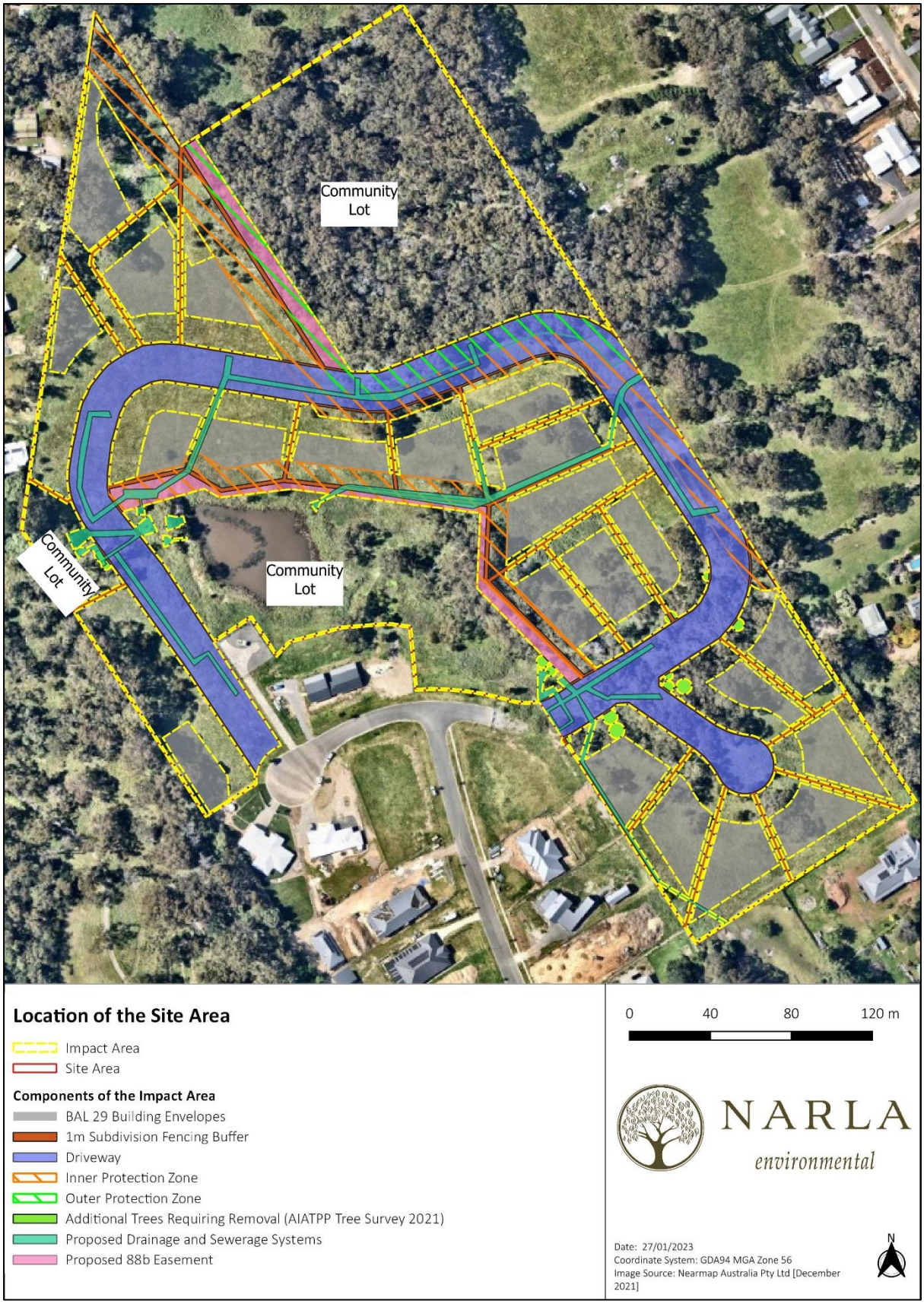

Figure 1. The location of the Impact Area within the Site Area at Erith Street Bundanoon.

1.4 How the SEPP applies to the proposed subdivision

- The policy applies to each local government area listed in Schedule 2 of the SEPP:
    - The Wingecarribee Shire LGA is listed in Schedule 2 of the SEPP.
- The Koala Management Area Specified in Schedule 2 of the SEPP:
    - The Wingecarribee Shire LGA is under both the Central and Southern Tablelands and Central Coast KMA.
- The Site Area is not:
    - land dedicated or reserved under the National Parks and Wildlife Act 1974, or acquired under Part 11 of that Act;
    - land dedicated under the Forestry Act 2012 as a State Forest or a flora reserve;
    - land on which biodiversity certification has been conferred, and is in force, under Part 8 of the Biodiversity Conservation Act 2016; or
    - land in the following land use zones, or an equivalent land use zone, unless the zone is in a local government area marked with '*' Schedule 1 of the SEPP:
        - Zone RU1;
        - Zone RU2; or
        - Zone RU3.
- The policy further applies to the land, if the land:
    - Has an area of at least one hectare; and
        - The Site Area is approximately 10.33ha.
    - Does not have an approved koala plan of management applying to the land.
        - The Site Area does not have an approved koala plan of management.

1.5 Development Applications Impacting Koalas and/or Habitat

Development applications which are likely to impact Koalas and/or Koala habitat must address the criteria under each of the seven planning principles, as defined below:

Principle 1. Understand Koala habitat values	
Criteria 1.	The site is established as containing core koala habitat if a site area survey undertaken by a suitably qualified and experienced person has identified the presence of core koala habitat.
Criteria 2.	Further analysis is undertaken in order to understand the broader values of the core Koala habitat, including information about the Koala population using the habitat and any specific ecological functions the habitat might serve. Key questions which need to be addressed in meeting this criterion include: ▪ What is known about the size, health and viability of the Koala population? ▪ What is known about the generational persistence of the local Koala populations through an analysis of records to determine population trends and persistence over time? ▪ What is the broader landscape context of the habitat within the Site Area? For instance, is it contiguous with broader areas of habitat or relatively isolated, and what are the likely regional movement patterns of Koalas using the Site Area? ▪ Does the Site Area contain particular values that are likely to serve an important ecological function for Koalas? For instance, providing linkage between other habitats, or serving as a habitat buffer to broader areas? ▪ Could the habitat area and/or Koala population using the Site Area be important to the recovery of the Koala? For instance, does the habitat contain features that might provide refuge during droughts, extreme heat, or fire? Or is the population considered to be healthy, robust or showing relatively low incidence of disease? ▪ Drawing on evidence presented, what significance are the values of the site to preserving the existing Koala population and supporting recovering and expanding populations?
Principle 2. Avoid intensifying land use in Koala habitat areas through appropriate landscape planning and site selection	
Criteria 3.	Site selection takes into account Koala habitat values. In addressing this criterion, the development application needs to show: ▪ How has the development footprint avoided habitat? ▪ What feasible alternatives were assessed as part of the process?
Principle 3. Encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas	
Criteria 4.	Development avoids the direct loss of Koala habitat within the Site Area and avoids fragmentation.
Criteria 5.	Koala habitat is excluded from the development footprint.

Principle 4. Minimise potential direct impacts to Koalas through Koala sensitive design	
Criteria 6.	Development avoids direct impacts to Koala habitat within the Site Area. In addressing this criterion, the development application needs to show: ▪ How will impacts to Koala habitat be minimised so as to not fragment existing Koala habitat, impact the ability of Koalas to move across the landscape or impact the recovery and expansion of populations?
Criteria 7.	Where some loss of habitat cannot be avoided (and providing it is consistent with all other criteria set out here), development is designed in a way that retains higher value areas across the site and avoids fragmentation of habitat within the Site Area and more broadly within the region. For instance, this might mean prioritising the retention of koala trees with a diameter at breast height over bark (DBHOB) greater than 250 mm, or areas of core koala habitat that are in better condition, show signs of koala tree growth, are better connected with habitat more broadly, or contain features that might be important for refuge. Note: a "tree" is taken to be a plant with a DBHOB of 10 cm or greater.
Criteria 8.	Development is undertaken in a way that maintains the potential function of the core koala habitat. For instance, if the koala habitat within the site area has been identified as an important linkage corridor, development should be undertaken in a way that enables the continued movement of koalas.
Principle 5. Implement best practice measures for the management of identified risks to Koalas.	
Criteria 9.	All relevant indirect impacts to Koalas and Koala habitat associated with the development are identified. Potential indirect impacts which may be relevant include (but are not limited to): dog attacks, vehicle strikes, drowning in pools, increased risk of fire, introduction or spread of disease, disturbance, and impediments to movement.
Criteria 10.	Development uses best practice management measures to address the potential impacts considered likely to pose an increased risk to Koalas or their habitat. The types of measures or controls used to address impacts will vary depending on the nature of the development, the relative importance of the Site Area to Koalas, and the extent and magnitude of impacts. The specific requirements may be guided by development control plans relevant to each council area.
Principle 6. Use compensatory measures only where they can be shown to better promote the aim of the SEPP	
Criteria 11.	Compensatory measures are only used once it has been demonstrated that options to avoid, minimise and manage impacts to Koala habitat have been exhausted.
Criteria 12.	Where there is any direct loss of habitat or compromise in the potential function of a Koala habitat area (and providing it is consistent with all other criteria outlined here), suitable compensatory measures are provided. Determining the suitability of any proposed compensatory measures should be guided by the overall aim of the SEPP.
Principle 7. Use adaptive management strategies to monitor, evaluate and deliver appropriate planning outcomes for Koalas	
Criteria 13.	Development application includes a monitoring, adaptive management and reporting component against the key outcomes.

2. Koala Habitat Values

2.1 Site Description and Location

The Site Area covers an area of approximately 10.33ha and is located in the Wingecarribee Shire Local Government Area (LGA). The site is comprised mostly of historically cleared lands, with a section of intact remnant bushland in the north and the east as well as isolated trees, a dam and an unnamed tributary of Reedy Creek along the southern boundary. The Site Area is surrounded by rural properties that exhibit similar landscape features.

The Impact Area covers an area of approximately 5ha and occurs through the core of the site (**Figure 1**). The impact area does encompass some areas of remnant bushland however, the majority is located in historically cleared lands, with the intact bushland in the north to remain and proposed community lots to be revegetated in the south.

2.2 Koala Habitat Survey

Core Koala Habitat is defined as:

- an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or
- an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.

Highly suitable habitat is defined as:

- an area of vegetation where 15% or greater of the total number of trees within any Plant Community Type (PCT) are regionally relevant species of those listed in Schedule 3 of the SEPP.

The Site Area was assessed by Chris Moore and Sarah Cardenzana on the 12th February, 2020. After traversing the entire Site Area, it was determined that one (1) vegetation community was present, representing two (2) condition class (canopy condition and grassland condition). Narla determined that for the purpose of the Koala Assessment only the condition with canopy required assessment as the grassland condition contained no tree species and could not be considered as suitable Koala habitat.

Therefore, two (2) 20m x 20m quadrats were established within the canopy condition vegetation and sampled for full floristic diversity in order to determine the Plant Community Type (PCT) and estimate the number of Koala feed trees present within the area. Results of the sampling within the quadrat are shown below in **Table 1.** Where 15% or greater of the total number of trees within any PCT are regionally relevant species of those listed in Schedule 3 of the SEPP, the site meets the definition of highly suitable koala habitat.

Table 1. Koala feed trees identified within vegetation plots listed as regionally relevant for the Central and Southern Tablelands and the Central Coast Koala Management Areas.

Tree species	Abundance Plot 1 (number of individuals)	Cover Plot 1 (percentage of quadrat)	Abundance Plot 2 (number of individuals)	Cover Plot 2 (percentage of quadrat)	Total coverage (average across the PCT)
Eucalyptus cypellocarpa	1	15%	3	30%	22.5%
Eucalyptus globoidea	-	-	2	15%	7.5%
Eucalyptus radiata	6	50%	3	25%	37.5%

Within the vegetation plots six (6) different tree species were recorded in total with three (3) species being listed as Schedule 2 feed trees either within the Central and Southern Tablelands Management Area or the Central Coast Management Area. The three (3) tree species that weren't listed consisted of:

- Three (3) *Acacia melanoxylon* accounting for a total coverage of 2.55% across both plots;
- One (1) *Acacia elata* accounting for a total coverage of 5% across both plots; and
- One (1) *Eucalyptus ovata* accounting for a total coverage of 2.5% across both plots.

Across the six (6) tree species recorded within the plots, twenty (20) individual trees were counted across both floristic plots. Of the twenty (20) trees, fifteen (15) were listed as regionally relevant species. A further two (2) Koala feed trees were also identified elsewhere within the Subject Property but was not captured within the plots, these trees are:

- *Eucalyptus piperita; and;*
- *Eucalytpus viminalis.*

Based on the five (5) species of Koala feed trees identified across the Subject Property and the overall coverage exceeding 15% the vegetation within the Subject Property was therefore found to meet the guidelines definition of highly suitable Koala habitat.

Analysis of the floristics within the quadrat found the vegetation to be representative of PCT 944: Mountain Grey Gum – Narrow-leaved Peppermint grassy woodland on shales of the Southern Highlands, southern Sydney Basin Bioregion (Figure 2). A large number of PCT 944 diagnostic species (representing each stratum) were present within the quadrat. Moreover, the landscape position and geology of PCT 944 matches what was observed within the Site Area and surrounding area.

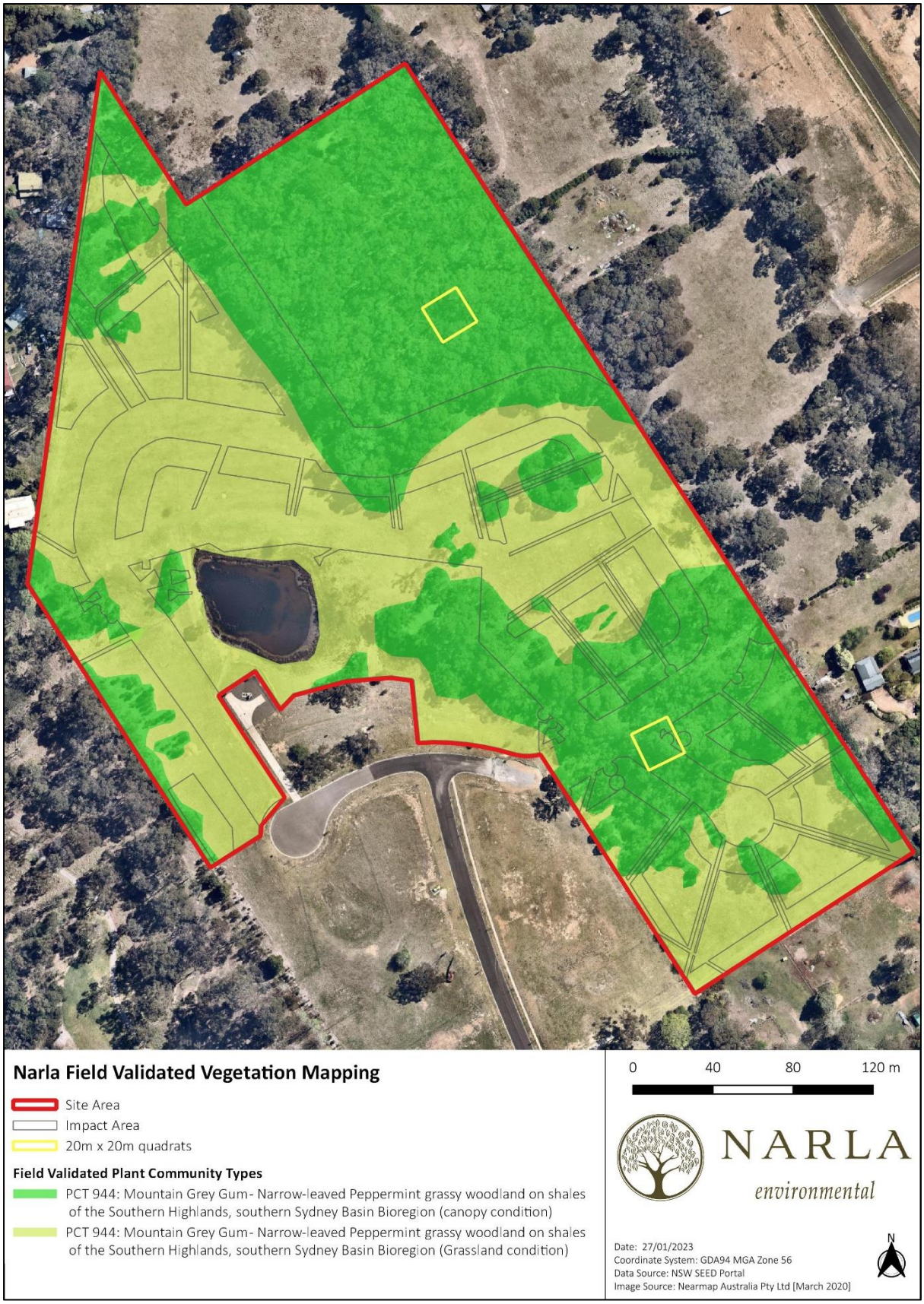

Figure 2. Habitat for Koalas within the Site Area.

2.3 Koala Habitat Values

The Site Area is located approximately 1km to the north west of Morton National Park. The environment surrounding the site area contains sections of fragmented bushland and isolated street trees, that are most likely only provide low quality resting or foraging habitat for Koalas. There has been one (1) record of Koalas within 2.5km of the Site Area since 2002 (i.e. within the last 18 years; Figure 3). This record was taken in 2019, with the on the outer edges of the 2.5 km buffer. Two (2) other records occur within 2.5km of the Site Area in 1994 and 2003.

Despite the Site Area containing remnant stands of intact vegetation the historic clearing within the site and the greater locality has resulted in the vegetation present being significantly fragmented sharing no connectivity with any significant areas of potential habitat. The most intact section of bushland, in the norther extent of the site will remain unimpacted by the proposed works, continuing to provide a potential refuge, as well as foraging and resting habitat to Koalas. Given the low number of proximal records it is unlikely that the areas of vegetation within the site is regularly utilised by Koalas however, due to high levels of fragmentation within the locality these stands of habitat are important.

With the area of intact vegetation being retained in the norther extent of the Site area along with the proposed community lots to be revegetated using Koala feed trees, under the direction of the associated Vegetation Management Plan (VMP; Narla 2022a). The proposed subdivision will maintain Koala habitat values across the Site Area aiding in the recovery of Koalas across the locality.

2.3.1 Southern Highlands Management Site

Key management sites for Koalas are being identified by the NSW Government and other program partners where feasible, cost-effective and beneficial management actions can be undertaken.

The Southern Highlands Management Site is defined by the Wingecarribee LGA with a total Site Area of approximately 268,933ha. The objectives of the management site are to:

- Minimise impacts of clearing/removal of key habitat;
- Restore or supplement habitat or habitat features;
- Minimise incidences of roadkill;
- Increase capacity of fauna rehabilitation groups to treat and release injured wildlife;
- Investigate presence/ susceptibility/ effects of disease;
- Maintain appropriate fire regime for the species/community;
- Increase understanding of the species ecological requirements; and
- Track species abundance/condition over time.

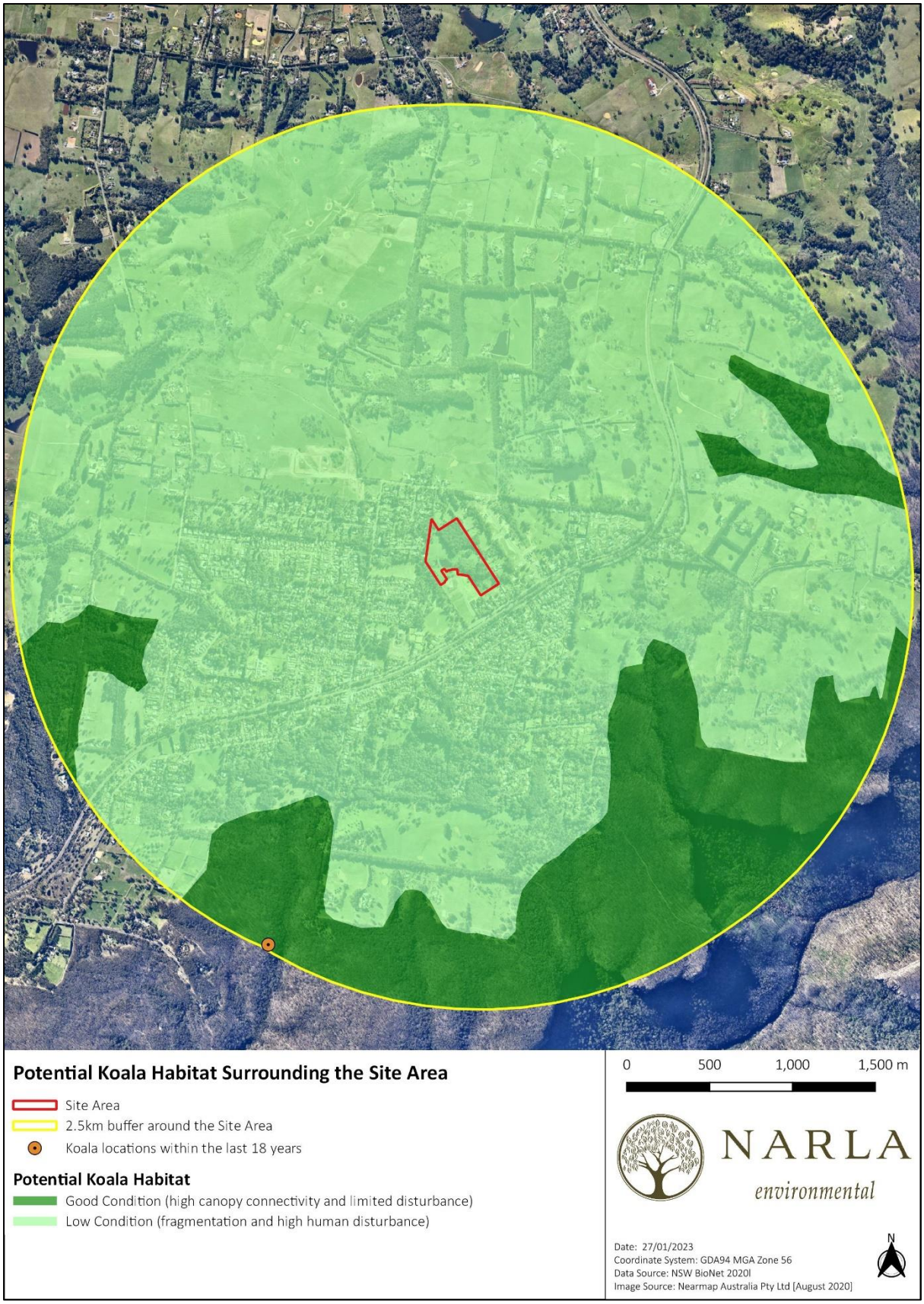

Figure 3. Habitat that might be associated with vegetation in the adjoining landscape and records within the vicinity of the site.

3. Avoiding Impacts to Koalas

3.1 Site Selection and Minimising Direct Impacts to Koalas

The subdivision has been strategically positioned to minimise impacts on native vegetation and Koala habitat as much as possible. A majority of the proposed subdivision will be located in historically cleared land, with only a select amount of intact vegetation requiring wholesale clearing and modification to accommodate APZs, which protect the dwellings from bushfire.

Vegetation will be maintained within the northern corner of the site, and the proposed community lots which will be revegetated under the guidance of the associated VMP (Narla 2022a) with listed Koala feed tees along the southern boundary. The vegetation within the site is already fragmented providing minimal connection to any surrounding bushland. The revegetation of the community lots as well as the retention of the potential habitat in the north of the Site Area, will ensure that Koala habitat will remain within the site post works.

The strategic placement of the proposed works in combination with the desire of the proponent to maintain the natural bushland aesthetics of the site will avoid significant impacts to Koalas. In addition, any temporary structures required for construction works should be located within the development footprint. This will avoid unnecessary impacts on native vegetation and Koala habitat elsewhere within the site.

4. Potential impacts

4.1 Residual Impacts

The residual direct impact to Koalas and Koala habitat associated with the proposed subdivision is the removal of feed trees. The proposed subdivision will impact approximately 5ha of vegetation representative of PCT 994. Of that 5ha, 2.88ha contains no trees of any species and is recorded as a disturbed, historically cleared condition class, providing no suitable habitat to Koalas. The remaining 2.12ha was comprised of canopy species representative of PCT 994.

Approximately 1.63ha of suitable habitat will require complete clearing, with 0.38ha being managed as an Inner Protection Area (IPA) and 0.11ha as an Outer Protection Area (OPA) to reduce bushfire hazard. The management of bushland for APZ purposes will not result in the wholesale clearing of vegetation but rather the select removal of trees and shrubs to achieve the required densities of an IPA and OPA as set out in the Planning for Bushfire Protection (NSW RFS 2019).

Koalas have not been recorded in the vicinity of the Site Area, with only one (1) record within 2.5km in the past 18 years (**Figure 3**). Therefore, it is not expected that the proposed removal of select feed trees will have a negative impact on the viability of a local Koala population, especially when considering the area of habitat that will be retained along with the restoration of the drainage reserve with Koala feed trees. The proposed subdivision has been designed in such a way to ensure that suitable Koala habitat remains within the Site Area.

A EPBC Assessment of Significant Impact and a BC Act Assessment of Significance (5-part Test) has also been undertaken for Koalas (**Appendix B** and **Appendix C**) and no significant impact was deemed likely.

4.2 Indirect Impacts

The most likely indirect impacts to Koalas and Koala habitat associated with the proposed subdivision are increased risks of vehicle strike, reduction in viability of adjacent habitat due to edge effects and the interruption of Koala behaviour due to an increase in noise and light. There is unlikely to be an increased risk of fire or introduction of disease. The aforementioned indirect impacts, although possible, are likely to be very localised and result in minor impacts to Koalas and their habitat. Therefore, it is not expected that the potential indirect impacts associated with the proposed subdivision will reduce the viability of a local Koala population.

5. Plan to Manage and Protect Koalas and their Habitat

5.1 Management Measures

A description of the management measures that will be implemented as part of the proposed construction and operations to manage the direct and indirect impacts is presented in **Table 2**.

Table 2. Management measures, outcomes and performance targets for impacts to Koalas within the Site Area.

Action	Management Outcome	Performance Target
Assigning a Project Ecologist for vegetation clearing	Prior to construction, the proponent should commission the services of a qualified and experienced Ecologist (minimum 3 years' experience) with a minimum tertiary degree in Science, Conservation, Biology, Ecology, Natural Resource Management, Environmental Science or Environmental Management. The Ecologist must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act. The Ecologist will be commissioned to: ▪ Undertake an extensive pre-clearing survey, delineating habitat trees and shrubs to be retained/removed, and ▪ Supervise the clearance of trees and shrubs (native and exotic) in order to capture, treat and/or relocate any displaced Koalas.	No Koalas negatively impacted during the clearing of vegetation.
Tree Protections	Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970) outlines that a Tree Protection Zone (TPZ) is the principal means of protecting trees on construction sites. It is an area isolated from construction disturbance so that the tree remains viable. Ideally, works should be avoided within the TPZ.	No trees to be impacted that aren't part of the Impact Area.
Erection of temporary Koala exclusion fencing	Temporary fencing should be erected around retained native vegetation that may incur indirect impacts on Koalas/ Koala habitat due to the construction works. This fencing will also deter Koalas from entering the construction area.	Successful exclusion of Koalas from the Impact Area during construction works.

5.2 Compensatory Measures

The loss of Koala feed trees within the Site Area will be compensated for by planting Koala feed, within the proposed community lots within the Site Area. The trees to be planted will be comprised of listed Koala feed trees that also represent PCT 944, including:

- *Eucalyptus cypellocarpa;*
- *Eucalyptus globoidea;*
- *Eucalyptus piperita;*
- *Eucalyptus radiata;* and
- *Eucalyptus viminalis*

Replanting should occur at a minimum ratio of 1:1, with >90% survival rate. Moreover, the vegetation proposed for retention, especially in the northern extent of the Site Area, is considered to be in good condition and should therefore be maintained to this standard (e.g. undergo weed control, no planting of exotics and promotion of native shrub and canopy tree regeneration). If Koalas are observed during summer, tree mounted watering points can be used. The successful implementation of the compensatory measures outlined within this report will result in the continuance of suitable Koala habitat within the Site Area.

All vegetation modification, maintenance and rehabilitation will be completed pursuant to the corresponding Vegetation Management Plan (Narla Environmental 2022a) for the site.

5.3 Monitoring Plan and Adaptive Management

To measure the success of this plan it is crucial to regularly and consistently monitor for Koalas and their habitat. Now that core Koala habitat has been determined to exist within the Site Area, it is crucial to monitor its condition in the long term. **Table 3** details monitoring activities that are to be undertaken within the Site Area to track Koalas and changes to their habitat. The overall performance criteria are focussed on achieving a net gain in core Koala habitat by replanting of Koala feed trees and removal of weeds.

Table 3. Monitoring schedule for Koalas and Koala habitat within the Site Area.

Monitoring activity	Purpose	Timing and Frequency	Responsibility
Monitor the loss and/ or increase of habitat through a vegetation plot or transect.	Identify losses and/ or increases of core Koala habitat across the Site Area.	Annually, following the commencement of works.	Project Ecologist
Monitor changes in habitat condition. Field observations include assessment of koala use tree recruitment, tree disease and defoliation. Particular focus on replanted koala use trees.	Understand any key areas for remedial action and success of replanting.	Annually, following the commencement of works.	Project Ecologist Proponent
Maintain records of any Koala sightings. Data immediately supplied to Wingecarribee Shire Council and submitted to Department of Planning and Environment.	Maintain up to date records for Wingecarribee Shire Council.	Ongoing	Proponent
Conduct assessments of Koala activity using scat surveys	Maintain up to date records for Wingecarribee Shire Council.	Annually, following the	Project Ecologist

Monitoring activity	Purpose	Timing and Frequency	Responsibility
coupled with searches for live animals.		commencement of works.	
Conduct additional assessment of impacts to Koalas and Koala habitat in response to disturbance events such as fire.	Obtain further understanding of local Koala populations and their reaction to disturbance.	As needed	Project Ecologist

An active adaptive management approach is recommended wherever there is high uncertainty in the system under management. This uncertainty may be related:

- to the basic ecology of the system (i.e. what are the important environmental drivers, what are the dynamics of processes like competition and predation);
- the relative effectiveness of different threat-abatement techniques (e.g. mechanical versus chemical weed control); and
- the effects of threat-abatement on the focal species or ecosystems.

The most appropriate monitoring regime is a single management approach (as detailed in this report) based on the best available information, monitoring the outcomes of that approach, and evaluating those outcomes carefully to inform adaptive changes.

5.4 Reporting Requirements

A report should be produced annually from the commencement of construction that provides a detailed account of the changes to Koala habitat within the Site Area. This report will summarise:

- The loss or increase in Koala habitat;
- The condition of the vegetation as a whole;
- Any revegetation works;
- Whether the performance criteria were met;
- Records of any Koala sightings;
- Any management issues/recommendations required to meet performance targets;
- Findings from Koala surveys; and
- Findings from any additional assessments.

Photographic evidence should be produced to illustrate progress of habitat management and native regeneration. The report is to be prepared by a suitably qualified Project Ecologist. Reporting/monitoring is to be completed for the life of the associated VMP (5-years; Narla 2022a).

Upon the expiry of the associated VMP, this report should be reviewed by a qualified Ecologist, to determine whether additional measures need to be implemented or monitoring continued.

6. References

Department of Planning (2019a). Koala Habitat Protection Guideline: Implementing State Environmental Planning Policy (Koala Habitat Protection) 2019

Department of Planning (2019b). State Environmental Planning Policy (Koala Habitat Protection)

Department of Planning, Industry and Environment (DPIE) (2020a). Saving Our Species P*hascolarctos cinereus*

Department of Planning, Industry and Environment (DPIE) (2023). NSW BioNet. The website of the Atlas of NSW Wildlife http://www.bionet.nsw.gov.au/

Narla Environmental (2022a). Vegetation Management Plan for Erith Street Bundanoon.

Narla Environmental (2022b). Biodiversity Development Assessment Report for Erith Street Bundanoon.

7. Appendices

Appendix A. Flora species identified within the Site Area during the February 2020 site assessment.
Appendix B. Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for Koala's
Appendix C. EPBC Assessment of Significant Impact for *Phascolarctos cinereus* (Koala)

Appendix A. Flora species identified within the Site Area during the February 2020 site assessment.

Scientific Name	Canopy	Midstory	Groundcover	Status*
Acacia elata	x			
Acacia melanoxylon		x		
Acacia stricta		x		
*Acetosella vulgaris**			x	High Threat Exotic
*Axonopus fissifolius**			x	High Threat Exotic
Berberis spp.*		x		
*Bromus catharticus**			x	
Brunoniella australis			x	
Bursaria spinosa		x		
Carex spp.			x	
*Cirsium vulgare**			x	
Daviesia ulicifolia		x		
Dichondra repens			x	
Eucalyptus cypellocarpa	x			Koala use tree for Central and Southern Tablelands and Central Coast Koala Management Area
Eucalyptus globoidea	x			Koala use tree for Central and Southern Tablelands and Central Coast Koala Management Area
Eucalyptus ovata	x			
Eucalyptus piperita	x			Koala use tree for Central and Southern Tablelands and Central Coast Koala Management Area
Eucalyptus radiata	x			Koala use tree for Central and Southern Tablelands Koala Management Area
Eucalyptus viminalis	x			Koala use tree for Central and Southern Tablelands and Central Coast Koala Management Area
Glycine microphylla			x	
Glycine tabacina			x	
Goodenia hederacea			x	
Hardenbergia violacea			x	
*Hypochaeris radicata**			x	
Juncus spp.			x	
Lomandra filiformis			x	
Lomandra longifolia			x	
*Lotus corniculatus**			x	
Microlaena stipoides			x	
Oxalis perennans			x	
*Paspalum dilatatum**			x	High Threat Exotic
Pittosporum undulatum		x		
*Plantago lanceolata**			x	
Podolobium ilicifolium		x		
Prunus spp.*			x	

Scientific Name	Canopy	Midstory	Groundcover	Status*
Pteridium esculentum			x	
Ranunculus spp.			x	
Rubus fruticosus agg.*			x	Priority Weed
Rytidosperma spp.			x	
*Taraxacum officinale**			x	
Trifolium spp.*			x	

* Denotes exotic species

Appendix B. Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for Koala's.

Biodiversity Conservation Act 2016 – Test of Significance (5-part Test) For *Phascolarctos cinereus* (Koala)		
BC Act Status: Endangered		
Background to Test of Significance	The Biodiversity Conservation Act 2016 Test of Significance (5-Part Test) is for the combined impacts of the proposed activity on the *Phascolarctos cinereus* (Koala) duo to the removal of Koala Feed Trees (KFTs) and highly suitable Koala habitat.	
Ecology	The Koala inhabits eucalypts woodlands and forests feeding on foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. The species spend most of its time in trees, but will descend and traverse open ground to move between trees. Females breed at two years of age and produce one young per year.	
(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 is not likely to have an adverse effect on the life cycle of the species such that the local population is likely to be put at risk of extinction. A total of 2.12ha of suitable Koala habitat, is proposed to be impacted by the proposal including the complete clearing of 1.63ha, the IPA management of 0.38ha and the OPA management of a further 0.11ha. An additional 5.33ha of the Subject Property will be protected and rehabilitated under a VMP (Narla 2022a) to continue to provide Koala habitat within the Subject Property. Due to the habitat to be retained and no signs of Koalas being observed within the Subject Property over numerous surveys and the nearest observation, within the last 18 years, being approximately 2.5km away the proposed works are not considered likely to place a local population 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**	N/A
	(ii) is likely to substantially and diversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,	N/A
(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 total of 2.12ha of suitable Koala habitat, is proposed to be impacted by the proposal including the complete clearing of 1.63ha, the IPA

Biodiversity Conservation Act 2016 – Test of Significance (5-part Test) For *Phascolarctos cinereus* (Koala)		
BC Act Status: Endangered		
	a result of the proposed development or activity, and	management of 0.38ha and the OPA management of a further 0.11ha. An additional 5.33ha of the Subject Property will be protected and rehabilitated under a VMP (Narla 2022a) to continue to provide Koala habitat within the Subject Property.
	(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	These areas of vegetation are already fragmented from the larger patch of the community within the locality. Therefore, it is not anticipated that the proposed works will fragment or isolate any areas of habitat, beyond what is already experienced.
	(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,	All areas of potential koala habitat are important. However, due to the fragmented nature of the vegetation to be impacted and the lack of proximal records of this highly recorded species in proximity to the Subject Property, and the VMP proposed to enhance sections of the site and retain habitat, it is not anticipated that the removal of this vegetation will impact on the long-term survival of this species.
(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 is not likely to have an adverse effect on any declared area of outstanding biodiversity value, directly or indirectly.	
(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 following Key Threatening Processes (KTPs) listed under Schedule 4 of the BC Act are relevant to the protection of potential habitat in the scope of the proposed development within the Subject Site for this species: ▪ Clearing of native vegetation	
References NSW Government (2017) NSW Legislation: Biodiversity Conservation act 2016 No 63, Schedule 4: Key Threatening Processes https://www.legislation.nsw.gov.au/acts/2016-63.pdf Department of Planning Industry and Environment (2023) Koala (*Phascolarctos cinereus*) Koala – profile: https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10616		

Appendix C. EPBC Assessment of Significant Impact for *Phascolarctos cinereus* (Koala).

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for Phascolarctos cinereus (Koala)	
EPBC Act Status: Endangered	
Significant impact criteria An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
Lead to a long-term decrease in the size of a population	The proposed development is not likely to lead to a long-term decrease in the size of an population of this species. A total of 2.12ha of suitable Koala habitat, is proposed to be impacted by the proposal including the complete clearing of 1.63ha, the IPA management of 0.38ha and the OPA management of a further 0.11ha. An additional 5.33ha of the Subject Property will be protected and rehabilitated under a VMP (Narla 2022a) to continue to provide Koala habitat within the Subject Property. Due to the habitat to be retained and no signs of Koalas being observed within the Subject Property over numerous surveys and the nearest observation, within the last 18 years, being approximately 2.5km away the proposed works are not considered likely to decrease the size of a population.
Reduce the area of occupancy of the species	The proposed activity will not reduce the area of occupancy for Koala's. A total of 2.12ha of suitable Koala habitat, is proposed to be impacted by the proposal including the complete clearing of 1.63ha, the IPA management of 0.38ha and the OPA management of a further 0.11ha. Due to the fragmented nature of the Subject Property from other areas of substantial habitat, and the lack of recent records of this highly recorded species it is unlikely Koala's would breed or forage within the Subject Property. Furthermore an area of 5.33ha within the Subject Property will be retained, enhanced and protected under a VMP to ensure Koala habitat remains within the Subject Property. Therefore, it is not expected that the area of occupancy will be reduced for Koala's as a result of the proposed works.
Fragment an existing population into two or more populations	Due to the already fragmented landscape, it is considered unlikely that any population of this species will be fragmented as a result of the proposed development.
Adversely affect habitat critical to the survival of a species	A total of 2.12ha of suitable Koala habitat, is proposed to be impacted by the proposal including the complete clearing of 1.63ha, the IPA management of 0.38ha and the OPA management of a further 0.11ha. Due to the fragmented nature of the Subject Property, and the lack of recent records of this highly recorded species it is unlikely Koala's would breed or forage within the Subject Property. Furthermore, an area of 5.33ha within the Subject Property will be retained, enhanced and protected under a VMP to ensure Koala habitat remains within the Subject Property. Therefore, the habitat to be impacted by the proposed works is not considered critical to the survival of this species.
Disrupt the breeding cycle of an population	Due to the fragmented nature of the Subject Property from other areas of substantial habitat, and the lack of recent records of this highly recorded species it is unlikely Koala's would breed or forage within the Subject Property. It is therefore considered unlikely that the proposed works will disrupt the breeding cycle of any population of this species.
Modify, destroy, remove, isolate or decrease the	The action will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. A total of 2.12ha of suitable Koala habitat, is proposed to be impacted by the proposal including the complete clearing of 1.63ha, the IPA management of 0.38ha and

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 Assessment of Significant Impact Criteria for Phascolarctos cinereus (Koala)	
EPBC Act Status: Endangered	
availability or quality of habitat to the extent that the species is likely to decline	the OPA management of a further 0.11ha. An area of 5.33ha within the Subject Property will be retained, enhanced and protected under a VMP to ensure Koala habitat remains within the Subject Property. Furthermore, no Koalas were observed at the time of any of the site surveys and with the nearest recorded observation, within the last 18 years, being approximately 2.5km, it is considered unlikely that the proposed works will result in this species going into decline.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Invasive exotic species are already present within the Subject Property. The proposed works are not expected to exacerbate this any more than is currently present.
Introduce disease that may cause the species to decline, or	The proposed action will not introduce disease that may cause the species to decline.
Interfere with the recovery of the species.	While an area of habitat will be removed as a result of the proposed development, it is not deemed likely that this will interfere with the recovery of the species. An area of 5.33ha within the Subject Property will be retained, enhanced and protected under a VMP to ensure Koala habitat remains within the Subject Property.
References Department of Climate Change, Energy, The Environment and Water (2023) Species Profile and Threats Database *Phascolarctos cinereus* (combined populations of Queensland, New South Wales and the Australian Capital Territory)	

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