




68-80 O'Connell Street, Caddens
Biodiversity Development Assessment Report

Caddens Estate Pty Ltd.

DOCUMENT TRACKING

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Executive Summary

This Biodiversity Development Assessment Report (BDAR) has been prepared by Eco Logical Australia Pty Ltd (ELA) for Caddens Estate Pty Ltd to accompany a State Significant Development Application (SSDA) for a mixed-use development (including in-fill affordable housing) at 68-80 O'Connell Street, Caddens, within the Penrith Local Government Area (LGA) (the 'subject land'). This report has been prepared to meet the requirements of the Biodiversity Assessment Method (BAM) 2020, under the NSW *Biodiversity Conservation Act 2016* (BC Act).

The proposed development will be assessed as a State Significant Development (SSD) under the *Environmental Planning and Assessment Act 1979* (EP&A Act). BDAR has been prepared to address the Secretary's Environmental Assessment Requirements (SEARs) issued for the project (SSD-80875966) on 14 March 2025. The BDAR concludes that the proposed mixed-use development has demonstrated measures to avoid and minimise impacts to biodiversity values where possible. Where impacts could not be avoided, mitigation measures were included including the implementation of a Vegetation Management Plan (ELA 2025a) for the 0.32 ha of PCT 3320 vegetation retained in the north of the subject land and a Fauna Management Plan (ELA 2025b). Measures to avoid and minimise impacts to biodiversity have been applied to the final development footprint the residual impacts to biodiversity that could not be avoided will be offset in accordance with the Biodiversity Offset Scheme.

The proposed development will impact upon 0.21 ha of native vegetation which includes 0.02 ha of PCT 3320 and 0.19 ha of planted native vegetation, therefore, the Streamlined Assessment Module – Small Areas was applied in accordance with Appendix C of the BAM. The subject land contains 0.19 ha of planted native vegetation which does not conform to a Plant Community Type (PCT) as such the Streamlined Assessment Module – Planted Native Vegetation was also applied to the BDAR.

This report has been prepared to meet the requirements of the BAM established under Section 6.7 of the BC Act. It describes the biodiversity values within the subject land, describes the impacts and outlines the measures to be taken to avoid, minimise and mitigate impacts to the PCTs and threatened species habitat within the subject land.

The report provides the number of biodiversity credits that would be required to be retired to offset the residual loss of biodiversity from the impacts of the development as described. The proposed development involves direct and indirect impacts to the biodiversity values within the development footprint, through the clearing of native vegetation within the subject land.

The vegetation within the subject land has been historically cleared and is maintained through regularly mowing practices. A patch of the threatened ecological community, *Cumberland Plain Woodland in the Sydney Basin Bioregion* was located in the northern portion of the subject land and has been mapped on the Biodiversity Values Map. *Cumberland Plain Woodland in the Sydney Basin Bioregion* corresponds with *PCT 3320 Cumberland Shale Plains Woodland* and is listed as part of a critically endangered ecological community under the BC Act. The patch of PCT 3320 mapped within the subject land is contiguous with vegetation on the adjoining land to the north. Due to the size and overall condition of the patch of PCT 3320 it also satisfied the criteria for listing as part of the critically endangered ecological community under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). . This TEC is listed as a Serious and Irreversible Impact (SAIL) entity This patch of 0.32 ha will

be retained within the subject land and managed through a Vegetation Management Plan (VMP) (ELA 2025a).

A second PCT, PCT 4025 Cumberland Red Gum Riverflat Forest was also recorded within the subject land, but it was not located within the development footprint. This PCT is associated with the *endangered River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* listed under the BC Act. Vegetation patches of high quality PCT 4025 may also represent part of the critically endangered *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria* under the EPBC Act. However, the vegetation patch lacked native ground cover and midstorey species and therefore, did not satisfy the criteria for listing under the EPBC Act. No direct impacts would occur on this TEC. This TEC is not listed as a SAIL entity. Mitigation measures have been included to protect the patch from indirect impacts.

No threatened flora species were recorded on or within the subject land and are unlikely to persist in the soil profile. The vegetation within the subject land was highly disturbed and fragmented from other intact patches of vegetation. It does not represent potential habitat for threatened flora species.

Using the Streamlined Assessment Module – Small Areas, only candidate Serious and Irreversible Impacts entities require targeted surveys. No threatened fauna species were recorded within the subject land. There is potential that highly mobile threatened species may utilise the vegetation for foraging resources on occasion. Consideration has been given to these highly mobile species during the preparation of this BDAR.

One SAIL entity was considered in this BDAR, being the swift parrot. A small patch of Important Habitat for *Lathamus discolor* (swift parrot) was mapped within the vegetation in the north of the subject land. The majority of this patch will be retained. This vegetation may provide important wintering foraging habitat for this migratory species. A species polygon was prepared and a total of one (1) species credits area required for 0.002 ha of impacts to swift parrot habitat. Effort to retain native vegetation including vegetation which corresponds with PCT 3320, and swift parrot Important habitat has been documented in this BDAR.

Following consideration of all the above aspects, the residual unavoidable impacts of the project were calculated in accordance with the BAM by utilising the Biodiversity Assessment Method Credit calculator (BAMC). The number of credits required to offset the removal of PCT 3320 is provided below. Impacts to planted native vegetation do not require offsets, consistent with the application of the Streamlined Assessment Module – Planted Native Vegetation.

Ecosystem credits required

Vegetation zone	PCT number	PCT name	Condition	Vegetation integrity score	Offset Trading Group	Direct impact (ha)	Credit required
1	3320	Cumberland Shale Plains Woodland	mown	57.1	Coastal Valley Grassy Woodlands >90%	0.002	1

The subject land contains two candidates for Serious and Irreversible Impact (SAII), Cumberland Plain Woodland and swift parrot. An assessment of each SAII entity has been included to determine if 0.02 ha of impacts to Cumberland Plain Woodland or 0.002 ha of impact on swift parrot important areas.

Three Matters of National Environmental Significance (MNES), *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*, *Pteropus poliocephalus* (grey-headed flying-fox) and swift parrot were identified as having potential to be affected by the proposed works. Grey-headed flying-fox is listed as Vulnerable under the EPBC Act, and it is considered that this species is likely to use some of the subject land for foraging.

The project was redesigned to avoid impacts to *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*; indirect impacts have been considered to this vegetation and will be mitigated through the implementation of a VMP (ELA 2025a). Protection of native fauna species during the removal of native vegetation and exotic grasses will be conducted in accordance with the Fauna Management Plan (ELA 2025b).

An assessment of the Commonwealth Significant Impact Criteria was undertaken for the three MNES discussed above and concluded that the project would not have a significant impact on this threatened species or ecological community. Therefore, a referral to the Commonwealth is not recommended.

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Credit Calculator
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
BOAMS	The Biodiversity Offsets Agreement Management System
BOS	Biodiversity Offset Scheme
CEEC	Critically Endangered Ecological Community
Commonwealth DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DAWE	Department of Agriculture, Water and the Environment (now Commonwealth DCCEEW)
DPE	NSW Department of Planning and Environment (now NSW DCCEEW)
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FM Act	NSW <i>Fisheries Management Act 1994</i>
ha	Hectares
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
LLS	Local Land Service
MNES	Matters of National Environmental Significance
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
NOW	NSW Office of Water
PCT	Plant Community Type
SAIL	Serious and Irreversible Impacts
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VI	Vegetation Integrity

Abbreviation	Description
VIS	Vegetation Information System
VMP	Vegetation Management Plan
WM Act	NSW <i>Water Management Act 2000</i>
WSU	Western Sydney University

1. Introduction

This Biodiversity Development Assessment Report (BDAR) has been prepared by Belinda Failles, an accredited person (BAAS18077) under the *Biodiversity Conservation Act 2016* (BC Act). The report was peer reviewed by Daniel McDonald (BAAS17056) who is also an accredited person under the BC Act. All credit calculations have been undertaken using the BAM Calculator (BAMC) version 80 in case number 00055099/55100.

This BDAR has applied the Streamlined Assessment Modules – Small Areas and Planted Native vegetation in accordance with Appendix C and D, respectively, of the Biodiversity Assessment Method 2020 (BAM).

1.1 Introduction

The State Significant Development Application (SSDA) seeks development consent for a mixed-use development, including in-fill affordable housing, comprising a combination of shop-top housing, residential flat buildings, commercial/retail premises, medical centre and recreation facility (indoor) at 68-80 O'Connell Street, Caddens. The proposed works include site preparation works, excavation, infrastructure, construction of the buildings and associated landscaping works.

Specifically, the SSDA seeks development consent for:

- demolition of an existing at grade car park and structures
- construction of 4 x 4 - 7 storey shop top housing buildings on the E1 Local Centre zoned land (68 O'Connell Street), comprising:
 - 177 residential dwellings
 - ground floor commercial, retail, medical centre and recreation facility (indoor). Fit out and operation of tenancies will be subject to future planning approval.
- construction of a single storey commercial premises (shop) located at the south western corner of the E1 Local Centre zoned land (68 O'Connell Street), comprising two tenancies (which will be subject to future planning approval)
- construction of basement carparking to service the shop top housing and commercial premises located on the E1 Local Centre zoned land (68 O'Connell Street)
- construction of 11 x 4 – 7 storey residential flat buildings on the R4 High Density Residential zoned land (80 O'Connell Street), including
 - 305 residential dwellings
 - basement carparking to service the proposed residential flat buildings
- internal roads
- associated infrastructure and services
- retention of Threatened Ecological Community (TEC) area in the north-eastern part of the site
- landscaping and communal open spaces including community park in the north-east,
- communal open spaces throughout and through site links.
- construction of public plaza used for events, markets and community gatherings

The proposal also incorporates 15% affordable housing and seeks to utilise the incentive controls under Chapter 2, Part 2, Division 1, Section 18 of the Housing SEPP to achieve 30% additional building height.

A Clause 4.6 request is submitted as part of this SSDA which addresses the variation from the development standard in regard to building height.

This SSDA also seeks to modify the existing development consent at the site (DA17/0995) pursuant to Section 4.17(5) and Section 4.24(4) of the EP&A Act

This report has been prepared in response to the requirements contained within the Secretary's Environmental Assessment Requirements (SEARs) dated 14 March 2025 (SSD-80875966). Specifically, this report has been prepared to respond to the SEARs requirement issued below.

Table 1: SEARs requirements

Item	Description of requirement	Section reference (this report)
16	<p>Unless a waiver has been granted, provide a Biodiversity Development Assessment Report (BDAR) that assesses any biodiversity impacts associated with the development in accordance with the Biodiversity Conservation Act 2016 and the Biodiversity Assessment Method 2020</p> <p>OR</p> <p>If the development is on biodiversity certified land, provide information to identify the site (using associated mapping) and demonstrate the proposed development is consistent with the relevant biodiversity measure conferred by the biodiversity certification.</p>	<p>This report has been prepared in accordance with the NSW <i>Biodiversity Conservation Act 2016</i> (BC Act) and the BAM.</p> <p>The subject land is not located on biodiversity certified lands.</p>

1.2 The site / subject land

The site (also defined as the subject land in this BDAR) is located at 68-80 O'Connell Street, Caddens, within the Penrith City Local Government Area (LGA). It is legally described as Lot 1 and 2 in DP 1268507. The site has an area of 53,941m² and is generally rectangular in shape.

The western portion of the site (68 O'Connell Street) currently comprises an approved commercial shopping centre development and associated carpark, commonly known as 'Caddens Corner'. It is zoned E1 Local Centre pursuant to the *Penrith Local Environmental Plan 2010* (PLEP 2010). This portion of the site is subject to a Concept DA (DA17/0995). A portion of 68 O'Connell Street, that is currently used for at-grade carparking, is subject to this SSDA.

The eastern portion of the site (80 O'Connell Street) is a cleared vacant lot, historically occupied by rural residential land uses. It is zoned R4 High Density Residential pursuant to the PLEP 2010. The site itself is not identified as a heritage item; however, it is located to the east of the 'Teacher's residence (former)' (Item 670), a local heritage item which is identified under Schedule 5 of the PLEP 2010.

High biodiversity value land is present at the site at its north-eastern corner, pursuant to the *Biodiversity Conservation Act 2016* (BC Act).



Figure 1: The site (Base source: Group GSA).

The site is located within the Caddens Release Area within the Penrith *Development Control Plan 2014* (PDCP 2014), and, under the Caddens Release Area Structure Plan, is strategically identified as the precinct centre with adjoining residential areas.

The site is approximately 2.2 kilometres (km) from Werrington Station and 1.8 km from Kingswood Station. It is also well serviced by local buses with stops in proximity to the site along O'Connell Street in both directions.

1.3 Surrounding context

The site is surrounded by established and newly developed low density residential areas of Caddens, Claremont Meadows, Werrington and Kingswood, as envisioned by the Caddens Release Area plan within the PDCP 2014.

A staged residential subdivision for 119 residential lots is located immediately to the north of the site at 46-66 O'Connell Street.

The area is interspersed with a variety of uses, including Western Sydney University (WSU), TAFE NSW and sporting fields.

The site is located 5.5 km east of Penrith City Centre and 30 km west from Parramatta CBD.



Figure 2: Site context (Base source: Group GSA)

1.4 Approved DA and tree assessment

The existing shopping centre (Caddens Retail Centre) within the site was previously assessed and approved by Penrith City Council under DA17/0995 (20 December 2018). The approved DA involved the removal of 60 trees for the Caddens Retail Centre development and the remainder of the trees retained within the site (Figure 3) (Elke 2017). The current SSDA has assessed all the trees within the site (Redgum 2025) including the south-western portion of the site where the retail development will occur. The SSDA arborist assessment identified that no trees in this patch of vegetation (i.e. PCT 4025) will be affected by the proposed new retail development (Redgum 2025). The proposed impacts will be located out of the tree protection zone and effective tree protection measures will be implemented to protect these trees. Therefore, potential indirect impacts to PCT 4025 which may occur as a result of the proposed development have been has in this BDAR.

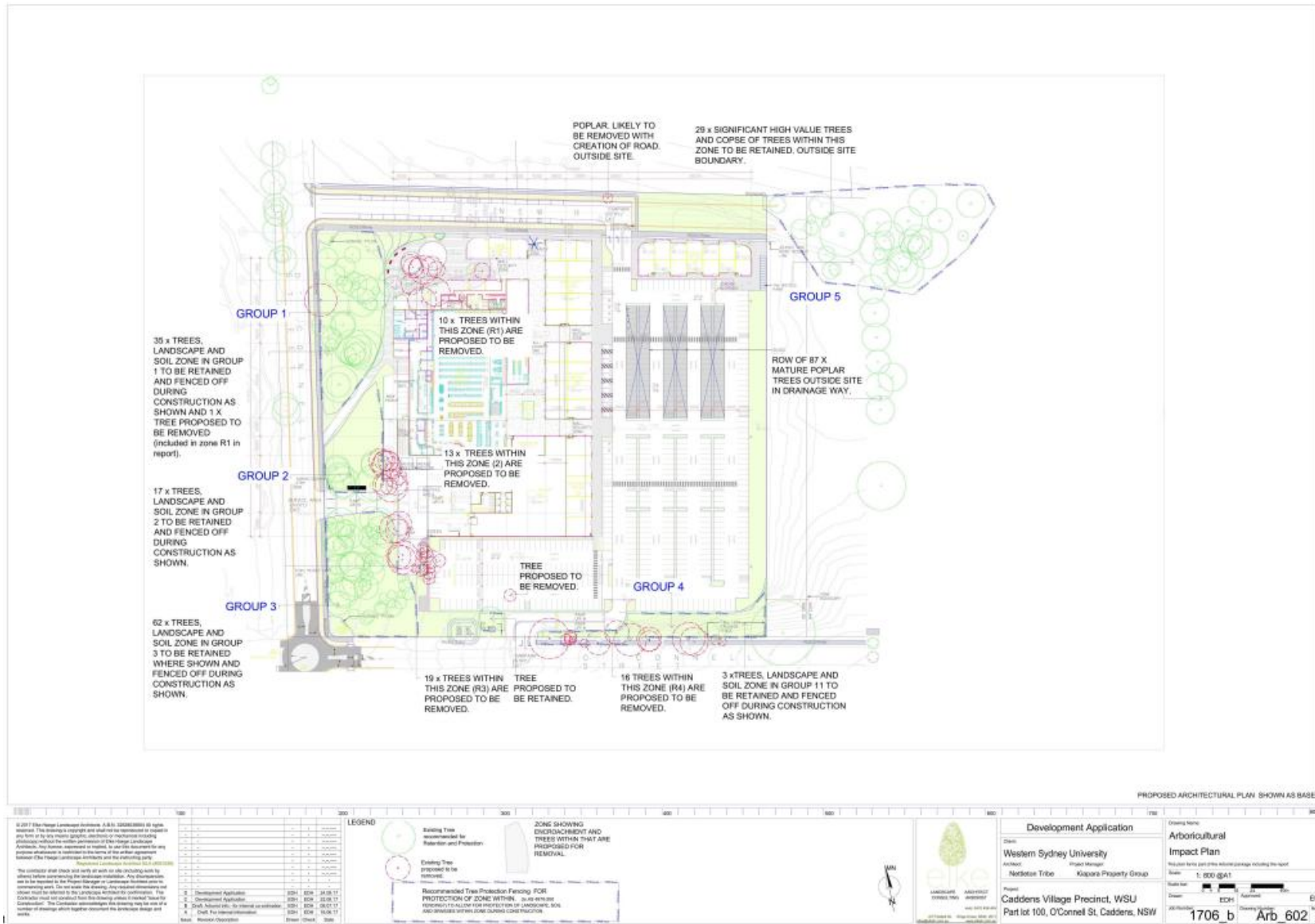


Figure 3: Arboricultural impact plan (Elke 2017)

1.5 Terminology

Definitions of terminology used throughout this report and set out in the Biodiversity Assessment Method (BAM) are presented in Appendix A.

There are several different terminologies used in this report which describes the proposed works. A description of each can be found below:

- The 'site' – this refers to the area subject to the development as defined in the proposal description (refer to Section 1.1– 1.3) and includes 68-80 O'Connell Street, Caddens.
- The 'development footprint' – this includes the building footprint, park, landscaping works, earthworks and removal of vegetation. The development footprint has been mapped to include the extent of the canopy to be removed to facilitate the development (Figure 6).
- The 'subject land' – this includes direct and indirect impacts of the proposed development. It includes the development footprint and the vegetation to be retained in the north and west. The subject land is consistent with the terminology in the BAM. The subject land is also the same as the site as per the consultant text in Section 1.1 – 1.3.

This report includes three base maps, the Location Map (Figure 4), the Site Map (Figure 5) and the development footprint (Figure 6).

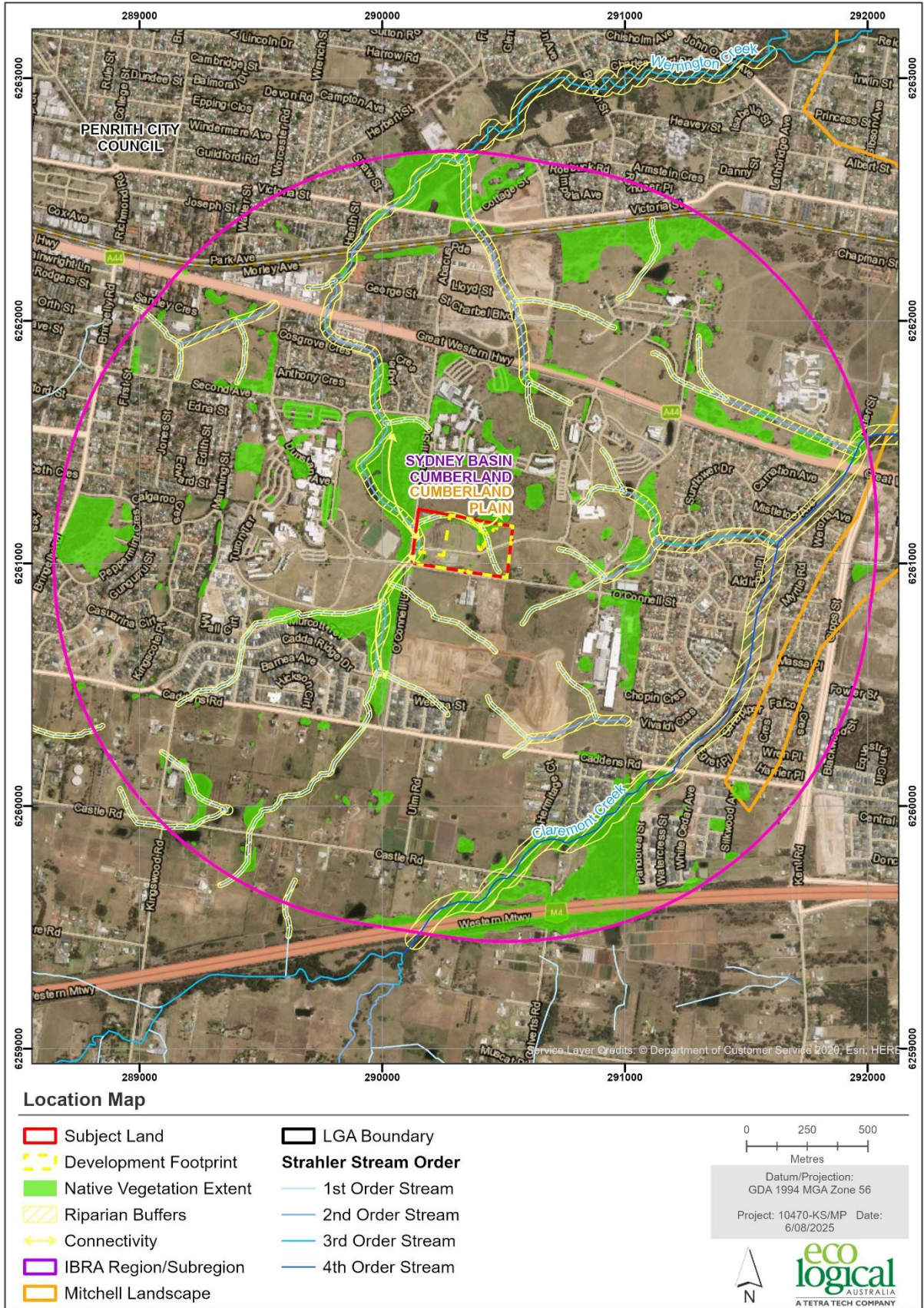


Figure 4: Location Map

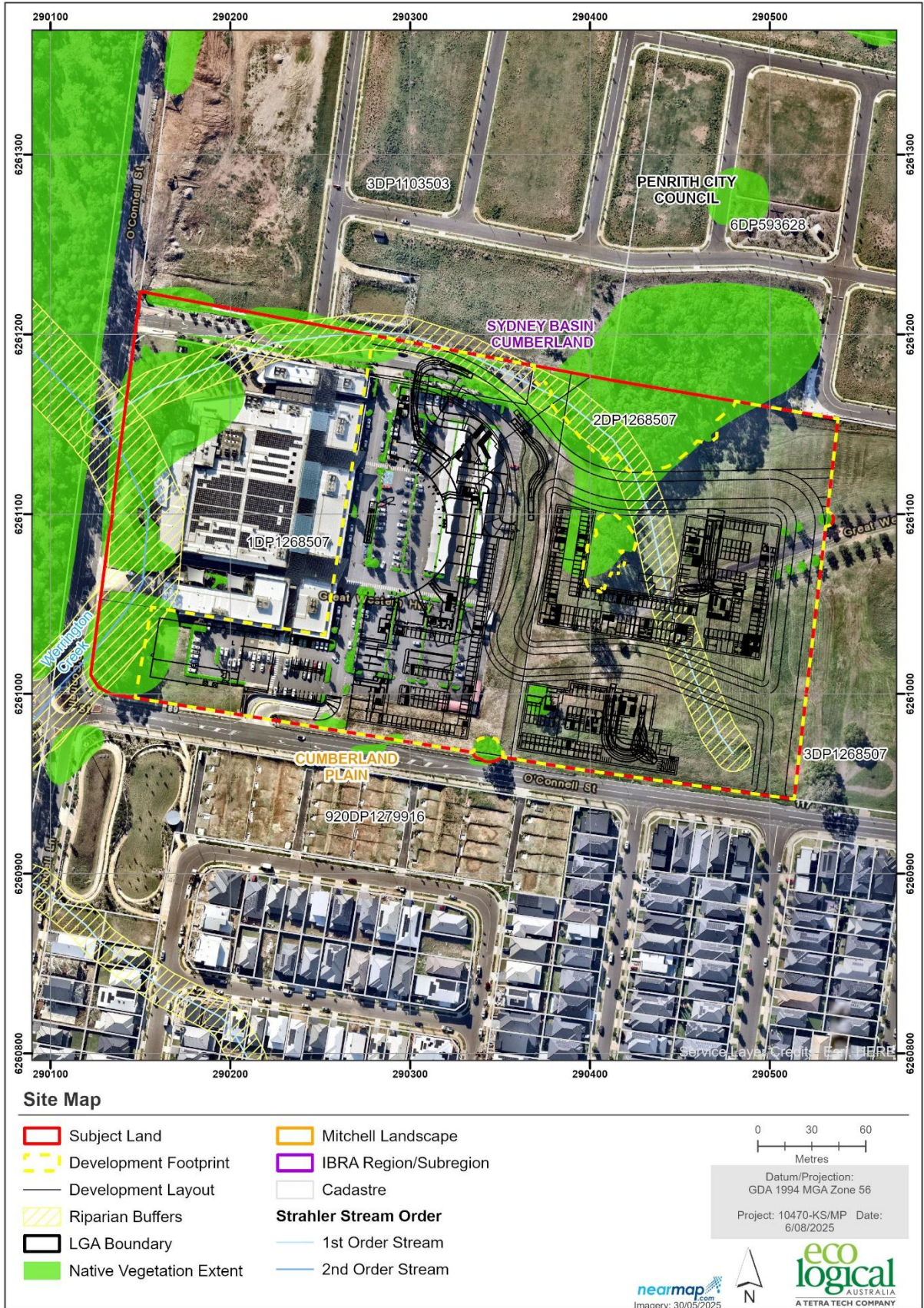


Figure 5: Site Map

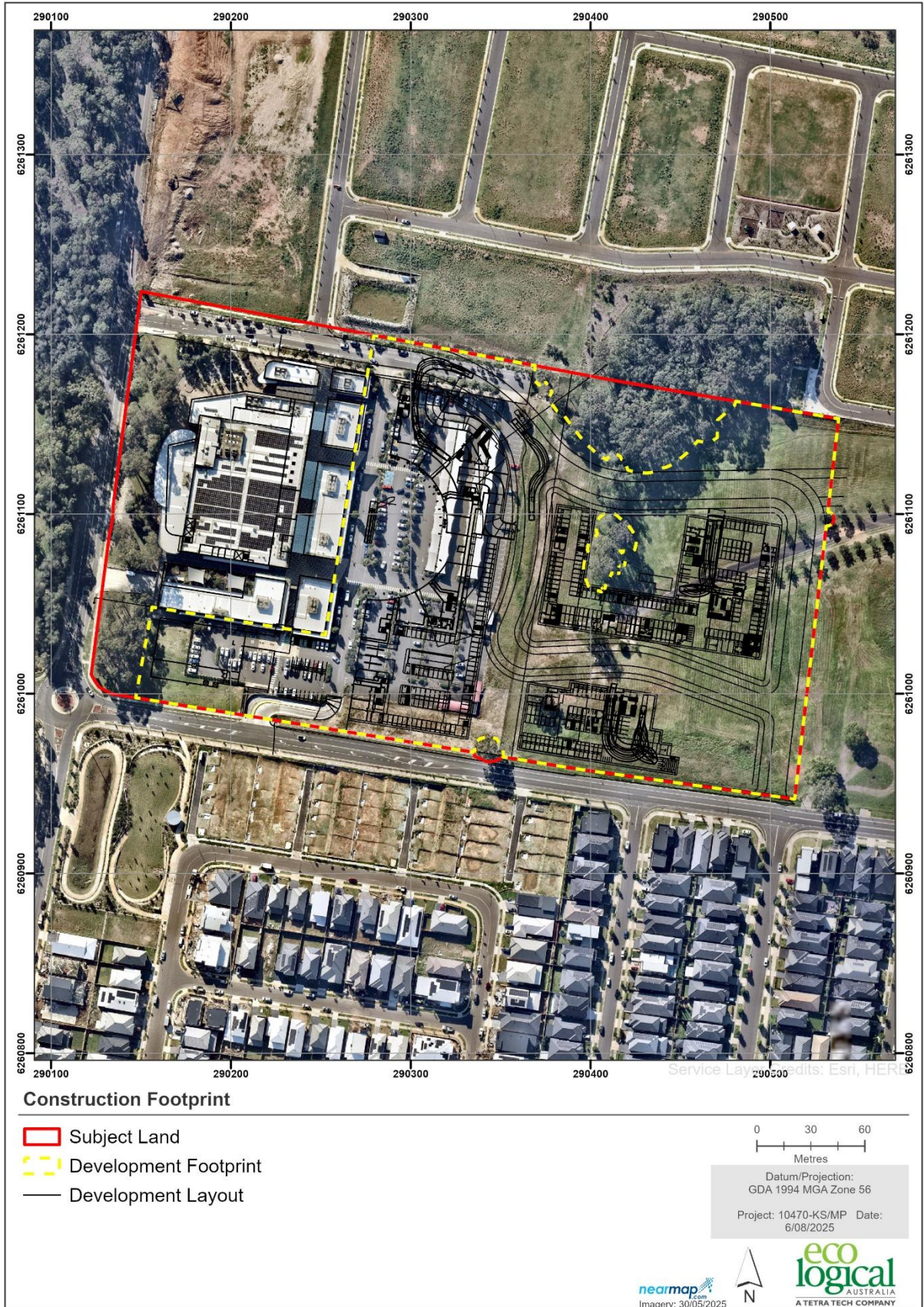


Figure 6: Construction footprint

1.6 Legislative context

Table 2: Legislative context

Name	Relevance to the project	Report section
Commonwealth		
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)	<p>The EPBC Act aims to protect Matters of National Environmental Significance (MNES) including wetlands of international importance, threatened species and communities and listed migratory species. An action that may or is likely to have a significant impact on MNES should be referred to the Commonwealth to determine whether it is a Controlled Action that requires approval from the Commonwealth.</p> <p>MNES have been identified on or near the subject land. Three MNES were identified as having the potential to occur within the subject land:</p> <ul style="list-style-type: none"> • <i>Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest</i> • <i>Pteropus poliocephalus</i> (grey-headed flying-Fox) • <i>Lathamus discolor</i> (swift parrot). <p>This report assesses impacts to MNES through an Assessment of Significance (Section 9.1) and concludes that the development is not likely to have a significant impact on MNES.</p>	Section 9.1 and Appendix E
State		
<i>Environmental Planning and Assessment Act 1979</i> (EP&A Act)	<p>The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of development proposals. The proposed development is to be assessed as a State Significant Development (SSD-80875966) under Part 4.7 (or 5.1) of the EP&A Act. The SEARs have been issued. This report addresses Biodiversity requirements as follows:</p> <p>Item 16 Biodiversity</p> <ul style="list-style-type: none"> • Unless a waiver has been granted, provide a Biodiversity Development Assessment Report (BDAR) that assesses any biodiversity impacts associated with the development in accordance with the <i>Biodiversity Conservation Act 2016</i> and the Biodiversity Assessment Method 2020. <p>OR</p> <ul style="list-style-type: none"> • If the development is on biodiversity certified land, provide information to identify the site (using associated mapping) and demonstrate the proposed development is consistent with the relevant biodiversity measure conferred by the biodiversity certification. <p>The subject land is not on biodiversity certified lands, therefore a BDAR is required. This report has been prepared in accordance with the BAM and the BC Act.</p>	This report
<i>Local Land Services Amendment Act 2016</i>	The LLS Act does not apply to the proposed development. The clearing of native vegetation proposed as part of this SSD will be assessed under Part 4.7 of the EP&A Act.	N/A
<i>Biodiversity Conservation Act 2016</i> (BC Act)	<p>Section 7.9(2) requires an SSDA to be accompanied by a Biodiversity Development Assessment Report (BDAR) unless the Planning Agency Head and the Environmental Agency determine that the Proposal is not likely to have any significant impact on biodiversity value.</p> <p>The proposed development will impact upon biodiversity values and therefore requires submission of a BDAR.</p>	This report

Name	Relevance to the project	Report section
<i>Fisheries Management Act 1994 (FM Act)</i>	<p>The purpose of the BC Act is to maintain a healthy and productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development.</p> <p>The development does not involve impacts to Key Fish Habitat, does not involve harm to marine vegetation, dredging, reclamation or obstruction of fish passage. A permit or consultation under the FM Act is not required.</p>	N/A
<i>Water Management Act 2000 (WM Act)</i>	<p>The WM Act is the sustainable and integrated management of the state's water for the benefit for both present and future generations. If a 'controlled activity' is proposed on 'waterfront land', an approval is required under the <i>Water Management Act 2000</i> (s91). 'Controlled activities' include:</p> <ul style="list-style-type: none"> • The construction of buildings or carrying out of works (with the exception of land based private dwellings, a dual occupancy building or related ancillary facilities). • The removal of material or vegetation from land by excavation or any other means. • The deposition of material on land by landfill or otherwise. Or • Any activity that affects the quantity or flow of water in a water source. <p>The subject land contains a 1st order stream (under the Strahler classification) which has been mapped flowing south to north and then west. The headwaters to the mapped stream consists of a grassy swale which flows south to north and converges with the concrete open drain in the north.</p> <p>The 1st order stream (partly functioning as an open concrete drain) is mapped within the subject land. The drainage line is currently partly concrete, running east to west along the northern portion of the subject land (Figure 14).</p> <p>Clause 42 and 28 of Schedule 4 in the regulation and <i>Water Management Act 2000</i> addresses concrete lined streams. Concrete lined streams are exempt from controlled activity approvals.</p> <p>The portion of the grassy drainage line which is upslope does not fit the definition of a 'river' as it does not have a bank and bed and does not experience hydrological flows (i.e. does not deposit sediments/sands). Therefore, the mapped stream does not meet the definition of a river. The proposed works do not require a Controlled Activities Approval. However, confirmation from the Natural Resource Access Regulator may be required to validate the presence of the mapped watercourse.</p> <p>A 2nd order stream is located west, outside of the subject land. It will not be directly impacted upon by the proposed development. The development footprint is more than 40 m from the 2nd order stream and therefore it is not located on Waterfront land.</p>	N/A
Environmental Planning Instruments		
<i>State Environmental Planning Policy (Resilience and Hazards) 2021</i>	<p>This SEPP came into effect on March 1, 2022, and consolidates a number of SEPPs including the Coastal Management SEPP 2018. This SEPP applies to land in the coastal zone. The proposed development is not located on land subject to this SEPP.</p>	N/A

Name	Relevance to the project	Report section
<p><i>State Environmental Planning Policy 2021 (Biodiversity and Conservation)</i></p>	<p>The Minister for Planning and Public Spaces announced that on 1 March 2022 the commencement of the new Biodiversity and Conservation SEPP. The Biodiversity and Conservation SEPP consolidates 11 SEPPs into one new theme-based focus SEPP. The following chapters are relevant for this project:</p> <ul style="list-style-type: none"> • Chapter 2 – Vegetation in Non-Rural Areas SEPP aims to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation. This SEPP applies to development that does not require consent. As the proposed works requires consent under the EP&A Act, Chapter 2 does not apply. • Chapter 4 – Koala Habitat Protection SEPP 2021, which applies if the proposed development is located within a Local Government Area specified in the SEPP. The subject land is not in an LGA specified in the SEPP (Penrith City Council), so Chapter 4 does not apply. • Chapter 6 – Water Catchments. The subject land is not within a regulated catchment in accordance with Chapter 6 of this SEPP, therefore development controls under Section 6.7 relating to aquatic ecology do not apply. 	N/A
<p><i>Penrith Environment (LEP) 2010 Local Plan</i></p>	<p>The subject land is zoned as the following under the Penrith LEP:</p> <ul style="list-style-type: none"> • R4 High Density Residential • B2 Local Centre <p>The subject land is not subject to the Biodiversity or Riparian overlay under the LEP.</p>	N/A

1.7 Sources of information used

The following data sources were reviewed as part of this report:

- BioNet Vegetation Classification Version 3.1 (NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) 2025a) (accessed April 2025).
- BioNet Atlas / Atlas of NSW Wildlife 5 km database search (NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) 2025b) (accessed April 2025).
- Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act) Protected Matters Search Tool 5 km radius database search (Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2025a) (accessed April 2025).
- Threatened Biodiversity Data Collection (TBDC) (OEH 2025) (accessed April 2025).
- NSW Government Planning Portal Spatial Viewer (NSW Government 2025).
- National Flying-Fox Monitoring data (DCCEEW 2025b) (accessed April 2025).
- Biodiversity Assessment Method 2020.
- Biodiversity Assessment Method Calculator (BAMC) version 80
- Additional Geographic Information System (GIS) datasets including soil, topography, geology and drainage.
- NSW Government State Vegetation Type Map (SVTM) (NSW DCCEEW 2025c) (accessed April 2025)
- Department of Planning, Industry and Environment (DPIE) 2016. NSW (Mitchell) Landscapes – version 3.1.
- Department of Planning, Industry and Environment (DPIE) 2025. Soil Landscapes from espade (accessed April 2025)
- Arboricultural Impact Assessment (Redgum consultancy 2025)
- Aerial photography (including Google Earth and Historical Imagery) of the study area and surrounds were also used to investigate the extent of vegetation cover and landscape features.
- Eco Logical Australia 2021. 46 - 66 & 29 O'Connell St Caddens - Biodiversity Development Assessment Report
- Eco Logical Australia 2024. 68 - 80 O'Connell Street, Kingswood - Biodiversity Development Assessment Report
- ELA 2025a Vegetation Management Plan
- ELA 2025b Fauna Management Plan
- ELA 2025c Bushfire Protection Report.

Species searches from the Commonwealth Protected Matters Search Tool (PMST) were performed on 14 May 2025. The results of this search were combined to produce a list of threatened species, populations and communities either previously recorded or considered likely to occur within the study area. The likelihood of occurrences for threatened species, populations and communities in the study area was then determined based on location of database records, the likely presence or absence of suitable habitat in the study area, and knowledge of the species' ecology. This information informed the subsequent field assessment.

After the field inspection had been completed, the likelihood of occurrence of each species, population or communities was re-assessed. This was based on the increase in knowledge about the extent and

type of habitats and which species were present within the study area. The likelihood of occurrence for threatened species populations and communities within the study area is present in Appendix D.

2. Streamlined Assessment Module

Two streamlined assessment modules were applied for this assessment. These include specific requirements that must be met to assess the impacts on biodiversity values. Both are detailed in the following sections.

Appendix C of the BAM also does not specify that it cannot be used with other modules such as Appendix D Streamlined assessment module – planted native vegetation. The planted native vegetation module therefore been used as set out below.

Section 7.14 (1) of the BC Act requires an application for development consent under Part 4 of the *Environmental Planning and Assessment Act 1979*, to be accompanied by a BDAR if the Biodiversity Offset Scheme (BOS) is triggered. Section 2.2 of BAM sets out the streamlined modules. Appendix C of BAM 2020 sets out the circumstances in which the small area assessment can be used. Appendix D of the BAM 2020 outlines a streamlined assessment module for assessing planted native vegetation. The streamlined assessment module can be applied where part of the subject land contains planted native vegetation.

2.1 Streamlined Assessment Module – Small Areas

Appendix C of the BAM 2020 outlines a streamlined assessment module for assessing small areas. The streamlined assessment module can be applied where the area clearing limits are under a certain threshold, outlined below in Table 3.

The minimum lot size associated with Lot 2 DP1268507 is 800m². Lot 1 DP1268507 does not have a minimum size lot, therefore the actual lot is used. Where the development covers two lots with different minimum sizes, then the smallest lot size is used for the entire lot. Therefore, the property is 800 m² and the area to be cleared is less than 1 ha, therefore, the small area module has been applied for this assessment in accordance with Appendix C of the BAM 2020 (Table 4).

ELA sent a request to the BOS Help Desk on 17 June 2025 to confirm the use of a small areas assessment module is appropriate for the SSDA. The BOS response indicated that the SSD is entered as a Part 4 small areas assessment and provide justifications. However, this response was provided after the case study was entered into the BAM-Calculator. Therefore, ELA utilised previous correspondence to utilise the major projects case study. A copy of both correspondences are provided in Appendix B. It is noted that both methods results in the same credit outputs for the case study.

Table 3: Area clearing limits for application of the small area development module

Minimum lot size associated with the property *	Maximum area clearing limit for application of the small area development module
Less than 1 ha	≤1 ha
Less than 40 ha but not less than 1 ha	≤2 ha
Less than 1000 ha but not less than 40 ha	≤3 ha
1000 ha or more	≤5 ha

Minimum lot size associated with the property ***Maximum area clearing limit for application of the small area development module**

*shown in the lot size maps made under the relevant local environmental plan (LEP), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP).

Table 4: Criteria for application of streamlined assessment module – small area in accordance with Appendix C of the BAM 2020

Criteria	Response and justification
<p>The streamlined assessment module for small area developments must only be used according to the maximum area clearing limits* shown in Table 12 of the BAM 2020.</p> <p>* <i>Maximum area clearing limits are associated with the minimum lot size for a property under the relevant LEP or actual lot size where there is no minimum lot size in the LEP.</i></p>	<p>Yes – 800m² for Lot 2 DP 1268507.</p> <p>Lot 1 DP 1268507 does not have a minimum size lot.</p> <p>The proposed development would clear 0.02 ha of PCT 3320 and 0.19 ha of planted native vegetation which is less than the threshold for clearing.</p>
<p>The streamlined assessment module for small area developments may be used to assess the biodiversity values of land that is located within an area on the Biodiversity Values Map, except where the biodiversity value included on the Biodiversity Values Map is core koala habitat.</p>	<p>Yes – the subject land contains land mapped on the Biodiversity Values Map as it contains threatened ecological community; however, this area is not mapped as core koala habitat.</p>
<p>Can the streamlined assessment module – small area be applied?</p>	<p>Yes</p>

2.2 Streamlined Assessment Module – Planted Native Vegetation

Section 2.2 of the BAM contains a streamlined assessment module for planted native vegetation. The streamlined assessment can be used where the native vegetation was planted for purposes such as street trees and other roadside plantings, windbreaks, landscaping in parks and gardens, and revegetation for environmental rehabilitation.

The streamlined assessment module for planted native vegetation has been applied to part of the subject land where areas of planted native vegetation will be impacted. All other areas of non-planted vegetation impacted within the subject land will be assessed in this BDAR under the Small Area Assessment Module of the BAM 2020.

The field survey conducted by ELA in 2022 identified the presence of two *Callistemon viminalis* (weeping bottlebrush) in the old cinema area, interspersed with exotic horticultural species located adjacent to a concrete footpath and gravel road. The carpark includes gardens which includes horticultural varieties of planted native vegetation (*Corymbia* sp.). The *Callistemon* and *Corymbia* species are not associated with the locally occurring Plant Community Types (PCTs) such as PCT 3320 – Cumberland Plain Woodland and PCT 4025 - Cumberland Red Gum Riverflat Forest. Therefore, these species are planted native species incorporated into landscaping and do not represent part of a locally occurring PCT.

The planted native vegetation within the subject land has been planted for the purpose of landscape plantings such as within the existing car park. Appendix D of the BAM provides a decision-making key for the assessment of the planted native vegetation. This decision-making key was applied to the sections of planted native vegetation mapped within the subject land. This assessment is displayed in Table 5.

Table 5: Decision-making key for planted native vegetation

Question	Response
<p>A1: Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal?</p>	<ul style="list-style-type: none"> • No – Planted native vegetation was located in the existing carpark and at the top of batters away from remnant vegetation. Planted native vegetation was small in size and located in rows, within garden beds and were not visible from earlier aerial imagery.
<p>A2: Is the planted native vegetation: planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and the primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat?</p>	<ul style="list-style-type: none"> • No – Planted native vegetation does not include representative species which are part of a local PCT. Planted native vegetation includes <i>Callistemon viminalis</i> which is a widely cultivated species and cultivated <i>Corymbia</i> species which are not indigenous to NSW. <i>Callistemon viminalis</i> natural distribution is north from Gloucester and does not include the subject land.
<p>A3: Is the planted/translocated native vegetation individuals of a threatened species or other native species planted/translocated for the purpose of providing threatened species habitat under one of the following:</p> <ul style="list-style-type: none"> • species recovery project • <i>Saving our Species</i> project • other types of government funded restoration project • condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat • legal obligation as part of a condition or ruling of court. This includes regulatory directed or ordered remedial plantings (e.g. Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act) • ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or • approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for works on waterfront land under the NSW <i>Water Management Act 2000</i>)? 	<ul style="list-style-type: none"> • No – the native species present are not listed as threatened under the BC Act or EPBC Act. They have not been planted for rehabilitation works and have not been planted or translocated for the purposes listed.
<p>A4: Was the planted native vegetation (including individuals of a threatened flora species) undertaken voluntarily for revegetation, environmental rehabilitation or restoration without a legal obligation to secure or provide for management of the native vegetation?</p>	<ul style="list-style-type: none"> • No – the planted native vegetation forms part of the landscaping of the existing shopping centre car park and several <i>Callistemon viminalis</i> which were planted near concrete hardstands in the subject land.
<p>A5: Is the native vegetation (including individuals of a threatened flora species) planted for functional,</p>	<ul style="list-style-type: none"> • Yes – the planted native vegetation has been planted for aesthetics purposes associated with landscaping

Question	Response
<p>aesthetic, horticultural or plantation forestry purposes? This includes examples such as: windbreaks in agricultural landscapes, roadside plantings (including street trees, median strips, roadside batters), landscaping in parks, gardens and sport fields/complexes, macadamia plantations or teatree farms?</p>	<p>for the existing shopping centre carpark and previous Kingswood Cinema.</p> <ul style="list-style-type: none"> • Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied)
<p>A6: Is the planted native vegetation a species listed as a widely cultivated native species on a list approved by the Secretary of the Department (or an officer authorised by the Secretary)?</p>	<ul style="list-style-type: none"> • N/A

Section D.2 of Appendix D of the BAM requires that the planted native vegetation is assessed for threatened species habitat. Opportunistic survey and habitat assessment for threatened flora and fauna habitat was undertaken as part of the field survey. Following a habitat assessment of this area it was determined that the planted native vegetation is unlikely to provide suitable habitat for threatened flora species.

No hollow-bearing trees, nests, scats, scratches, or any other evidence of fauna were identified within the area of planted native vegetation on site during the 2022 surveys conducted by ELA. It was determined that the planted native vegetation does not provide roosting or breeding habitat for threatened fauna species. The planted native vegetation could possibly serve as marginal foraging habitat for urban and peri-urban fauna such as common bird species however is unlikely to serve as important foraging habitat for threatened fauna species. There will be 0.19 ha of planted native vegetation impacted under the proposed development which does not require offset as a result of this streamlined assessment module.

3. Landscape features

The site-based method was applied for this assessment; therefore, the assessment area is the 1,500 m buffer surrounding the outside edge of the boundary of the subject land.

The landscape features considered for this assessment are presented in Table 6 and Figure 5.

Table 6: Landscape features

Landscape feature	Subject land / Development site	Assessment area	Data source
IBRA Region(s)	Sydney Basin.	Sydney Basin	Interim Biogeographic Regionalisation for Australia (IBRA), Version 7
IBRA subregion(s)	Cumberland IBRA subregion.	Cumberland IBRA subregion.	IBRA, Version 7
Estuaries and wetlands	The subject land does not contain estuaries or wetlands.	The assessment area does not contain estuaries or wetlands.	NSW wetlands, Aerial imagery
Geological features of significance and soil hazard features	The subject land does not contain any geological features of significance (i.e., karst, caves, crevices, cliffs etc.) or soil hazard features.	The assessment area does not contain any geological features of significance (i.e., karst, caves, crevices, cliffs etc.) or soil hazard features	Aerial imagery Field survey Topography and contour data sets
Areas of Outstanding Biodiversity Value	The subject land does not include areas of declared critical habitat (accessed 1 July 2025).	The assessment area does not include areas of declared critical habitat (accessed 1 July 2025).	Register of Declared Areas of Outstanding Biodiversity Value (DPE 2022)
NSW (Mitchell) Landscapes	Cumberland Plain	Cumberland Plain	NSW (Mitchell) Landscapes – version 3.1 (DPIE 2016)
Percent (%) native vegetation extent	The subject land is approximately 8.28 ha and contains approximately 0.21 ha of native vegetation. There are no differences between the mapped vegetation extent and the aerial imagery.	The assessment area is approximately 877.49 ha and contains approximately 108.1 ha of native vegetation (12%).	Calculated using aerial imagery and ArcGIS software – Field survey found no differences between the mapped vegetation extent and the aerial imagery.

Landscape feature	Subject land / Development site	Assessment area	Data source
Rivers and streams	<p>The subject land contains a 1st order stream under the Strahler classification system (Figure 4). There is a 1st order stream (now partly functioning as an open concrete drain and partly grassy swale) mapped within the subject land.</p> <p>The <i>Water Management Act 2000</i> (WM Act) defines a river as:</p> <ul style="list-style-type: none"> • any watercourse, whether perennial or intermittent and whether comprising a natural channel or a natural channel artificially improved, and • any tributary, branch or other watercourse into or from which a watercourse referred to in paragraph (a) flows, and • anything declared by the regulations to be a river. <p>The south to north portion of the drainage line (grassy swale) does not fit the definition of a ‘river’ (Water Management Act) as it does not have a bank and bed and does not experience hydrological flows (i.e. does not deposit sediments/sands). The concrete section (along the northern boundary) does not meet the definition of a ‘river’ (see legislation table – Table 2). However, as the watercourse has been mapped within the subject land and requires an assessment. For the purpose of this report, the 1st Strahler order stream was included and impacts to hydrological flows have been assessed.</p> <p>The 1st order stream flows into a 2nd order stream (Werrington Creek) located west of the subject land. The proposed development works are located approximately 100 m from the 2nd order stream. Indirect impacts due to changes in hydrological flow and water quality to the 2nd order stream have been included in this assessment.</p>	<p>The assessment area includes several Strahler order streams the highest order is South Creek in the south-east of the assessment area. Claremont Creek is a 4th order stream. The watercourse within the subject land does not connect to Claremont Creek.</p>	<p>NSW LPI Waterway mapping, Aerial imagery</p>

Landscape feature	Subject land / Development site	Assessment area	Data source
<p>Connectivity of different areas of habitat</p>	<p>The subject land contains a patch of remnant vegetation along the northern boundary. This patch is fragmented from other vegetation by exotic grasslands, Caddens Corner shopping centre and roads. Planted native and exotic vegetation is present in patchy distribution within the subject land.</p> <p>A large tract of vegetation has been mapped adjacent to the subject land along Werrington Creek to the west. The vegetation is located on the University of Western Sydney (Kingswood campus) and is surrounded by a 2 m high fence. This vegetation has been fragmented from other tracts of vegetation by the formation of major arterial roads, namely, M4 Western Motorway in the south and Great Western Highway in the north which surrounds the subject land. Some connectivity may remain for highly mobile species such as birds or bats. This includes flyways for migratory birds and bat species moving through the landscape.</p> <p>Fragmented connections are present for highly mobile species as seen in Figure 4. For the purpose of this assessment, the connectivity features were assessed.</p>	<p>Connectivity in the assessment area has been discussed in the subject land.</p>	<p>Aerial imagery</p>
<p>Patch size</p>	<p>Patch size was calculated using available vegetation mapping for all patches of intact native vegetation on and adjoining the subject land. Although there are geographic barriers of major roads, namely M4 and Great Western Highway and large open landscapes surrounding the subject land, there is connectivity of the vegetation within the subject land with other patches of native vegetation and along riparian corridors. Therefore, the patch size area is >100 ha, therefore, the patch size area is within the size category of 101 ha (Figure 4).</p>	<p>Patch size has been discussed in the subject land.</p>	<p>Calculated using aerial imagery and ArcGIS software.</p>

4. Native vegetation

4.1 Literature review

Two PCTs has been mapped in the subject land. One large patch of PCT 3320 Cumberland Shale Plains Woodland has been mapped by the State type Vegetation Map (STVM) in the north east of the subject land (Figure 7). A second PCT, PCT 4025 Cumberland Red Gum Riverflat Forest was mapped in the south-west (Figure 7).

Historical aerial imagery from 1975 shows that the majority of the subject land has been historically cleared for agricultural use (Figure 8). A patch of native vegetation along the north-eastern boundary and a second patch of vegetation in the south-west are present from historical imagery and persists in 2025 aerial photography.

The eastern portion of the subject land was also used as the location of the former historic Kingswood drive-in open cinemas. Recently, the western portion of the subject land was developed into the new Caddens Corner shopping complex and outdoor carpark.

Today the subject land contains a large open space in the west of the subject land and a cluster of native vegetation is present along the north-eastern boundary. The vegetation in the north is contiguous with a patch of vegetation in the adjoining lands to the north. This patch has been mapped on the State Type Vegetation Map as PCT 3320 Cumberland Shale Plains Woodland (Figure 7). The vegetation in the south-western portion of the subject land is fragmented from similar vegetation through the formation of O'Connell Street. Drainage works has occurred along the western boundary and disturbance to the soil profile during the construction of the rip-rap drainage line.

The remaining vegetation within the subject land has not been mapped by previous vegetation data sets (NSW DCCEEW 2025c).

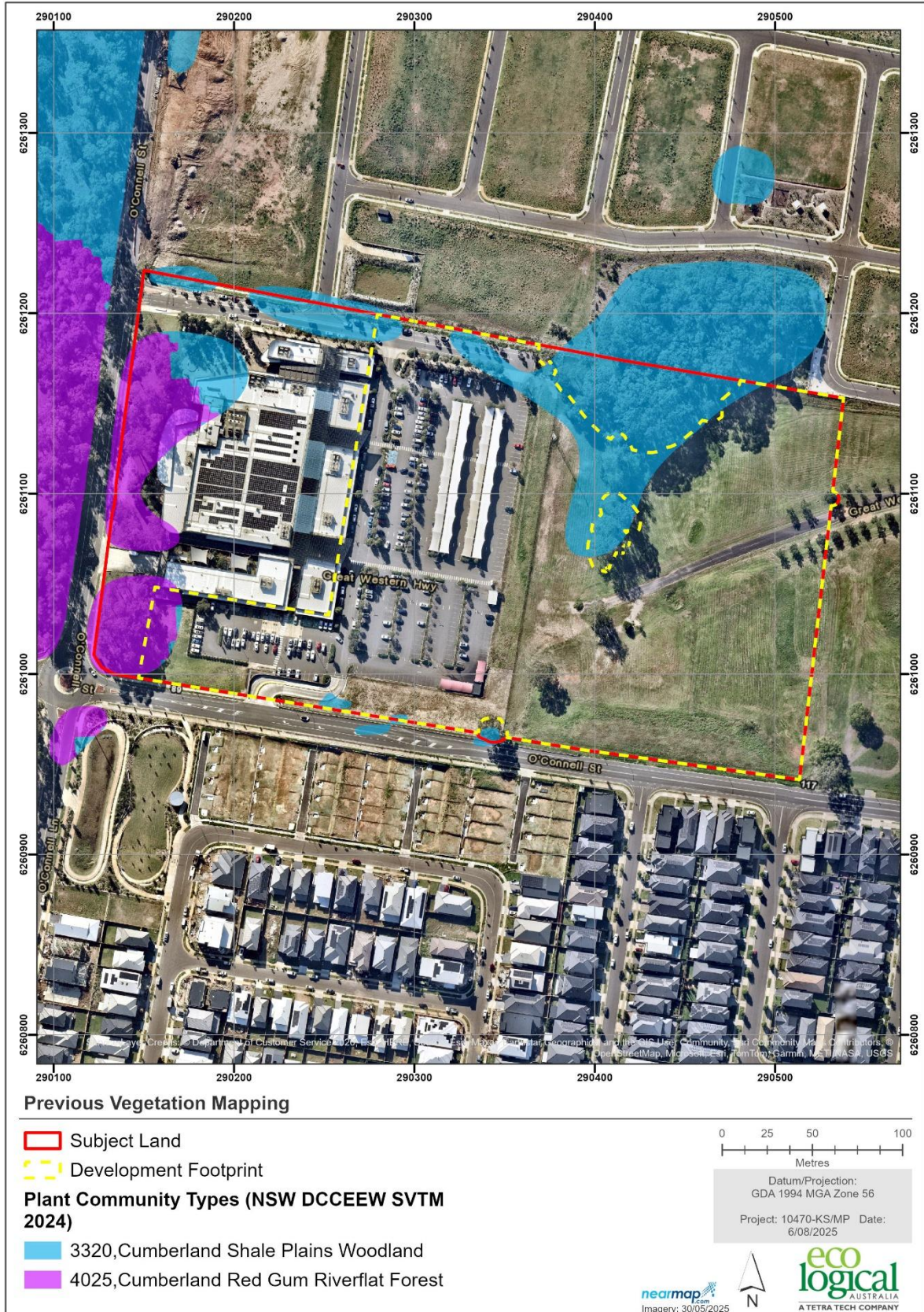


Figure 7: Previous vegetation mapping (NSW DCCEEW, 2025c)

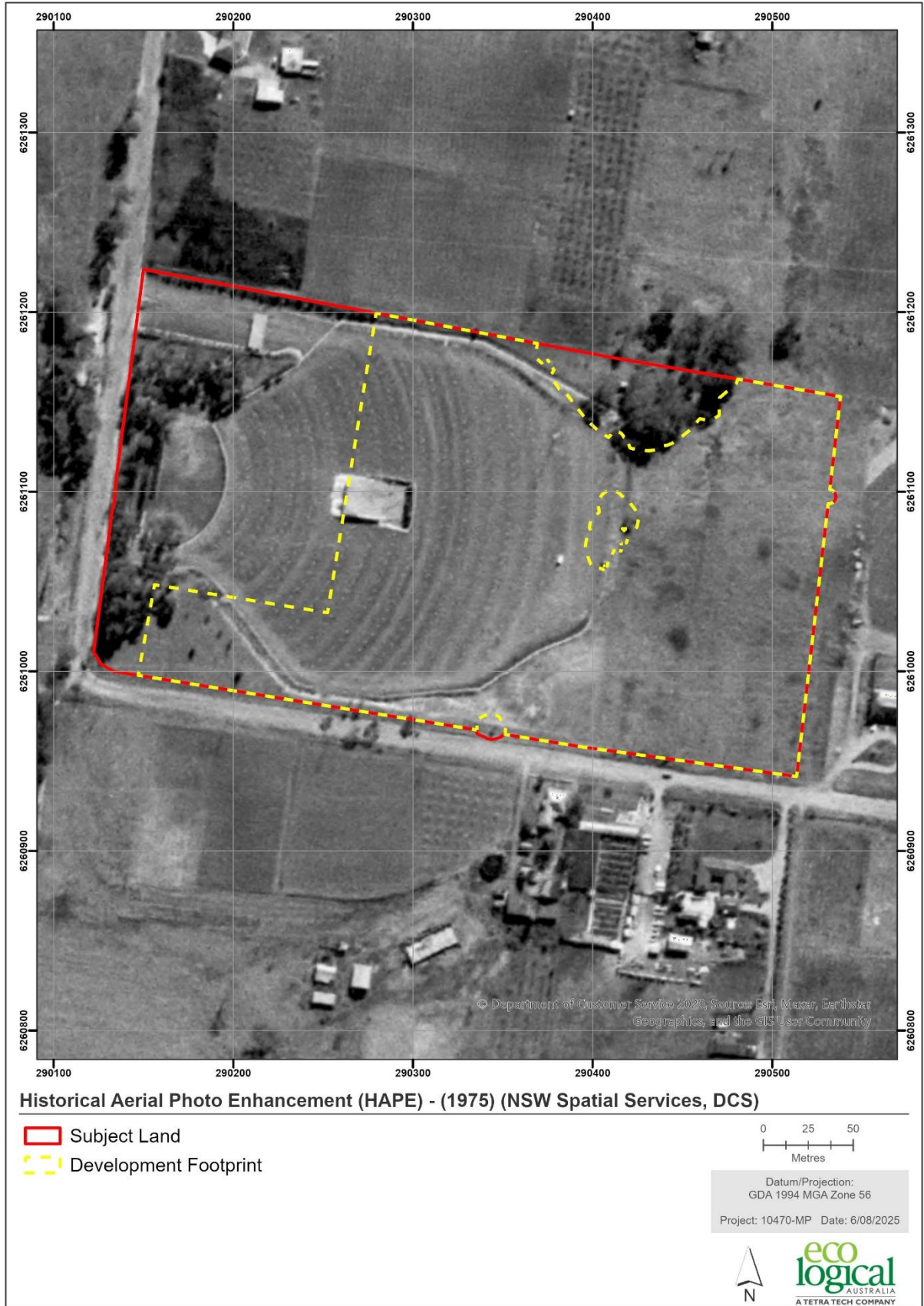


Figure 8: Historic aerial imagery from 1975 of the subject land

4.2 Survey effort

Vegetation survey and habitat assessment was conducted on 3 June 2022 by Belinda Failes.

A total of one full-floristic and vegetation integrity plot was undertaken to identify PCTs and threatened ecological communities (TECs) in the development footprint (Figure 16 and Table 7). The vegetation integrity plot was undertaken within the development footprint in accordance with the BAM (Table 8). All field data collected is included in Appendix B.

A second PCT (PCT 4025) was identified in the subject land during 2022 surveys but will not be impacted by the proposed development. A vegetation integrity plot was not conducted for this PCT as it was located outside of the development footprint. Consideration of indirect impacts and assessment of TECs was provided in this BDAR.

Table 7: Full floristic PCT identification plot within the development footprint

PCT ID	PCT Name	Number of plots surveyed
3320	Cumberland Shale Plains Woodland	1

Table 8: Vegetation integrity plots in development footprint

Veg Zone	PCT ID	PCT Name	Condition	Total area (ha)	Plots required	Plots surveyed
1	3320	Cumberland Shale Plains Woodland	Mown	0.02	1	1
2	4025	Cumberland Red Gum Riverflat Forest*	Low	0	0	0
-	-	Planted Native Vegetation	Planted	0.19	0	0
-	-	Exotic grass	Degraded	2.99	0	0
-	-	Exotic vegetation	Degraded	0.55	0	0
-	-	Built/Bare ground		2.07	0	0
TOTAL				5.82	1	1

*THIS PCT WAS LOCATED OUTSIDE OF THE DEVELOPMENT FOOTPRINT AND WILL NOT BE DIRECTLY IMPACTED BY THE PROPOSED WORKS

4.3 Plant Community Types present

One plant community type PCT 3320 Cumberland Shale Plains Woodland in moderate condition was identified within the development footprint (Table 9, Figure 15). A second PCT, PCT 4025 Cumberland Red Gum Riverflat Forest was recorded within the subject land, however, outside of the development footprint (Figure 10) and has been assessed in this BDAR for indirect impacts. Both PCTs correspond with listed threatened ecological communities (TEC) under the BC and/or EPBC Acts (Table 12). A discussion of the TEC listing is provided in Section 4.4.

The subject land also includes planted native vegetation (*Callistemon viminalis* (Weeping Bottlebrush) and *Corymbia* cultivars), planted exotics (*Nerium oleander* (Oleander) and *Olea europaea* subsp. *cuspidata* (African Olive)) and exotic grass (*Cenchrus clandestinus* (Kikuyu)). The subject land also contains built areas including an existing carpark which will be redeveloped.

Justification for PCT selection is provided below.

Table 9: Plant Community Type in the development footprint

PCT ID	PCT Name	Vegetation Class		Vegetation Formation	Area	Percent cleared
3320	Cumberland Shale Plains Woodland	Coastal	Valley	Grassy Woodlands	0.02	93%
		Grassy Woodlands				

4.3.1 PCT selection justification

Justification of the selection of the PCT recorded within the development footprint is based on quantitative analysis of full-floristic plot data and a summary is provided in Table 10. The soil landscape, elevation and vegetation mapping of the development footprint was used to determine the ‘best-fit’ PCT for native vegetation. *PCT 3320 Cumberland Shale Plains Woodland* was determined the most appropriate PCT for the development footprint.

Previous vegetation mapping (NSW DCCEEW 2025c, 2025) (Figure 7) indicated that the vegetation located in the north-eastern boundary of the development footprint contains a patch of PCT 3320. This patch of 3320 is contiguous with native vegetation on the adjoining land to the north and approximately 1 ha in size.

Soil landscapes were also used to determine the best-fit PCT. The development footprint is mapped on the Luddenham (erosional) soil landscapes which is associated with Wianamatta Shale group with low local relief of 50 – 120 m and gentle rolling hills (Chapman and Murphy 1989). The land associated with Luddenham has been cleared for grazing, remnant vegetation includes *E. moluccana* (Grey Box), lesser occurrence of ironbark species and *E. tereticornis*. The soil landscape and relief are consistent with vegetation PCT 3320 identified within the development footprint.

The field survey conducted by ELA confirmed the remnant vegetation within the northern boundary of the development footprint is consistent with PCT 3320. The canopy contained *Eucalyptus tereticornis* (forest red gum) and dominant ground cover species of *Microlaena stipoides* var. *stipoides* (weeping meadow grass) and occasional *Dichondra repens* (kidney weed). No mid story and native shrubs were present in this vegetation patch. Quantitative analysis of the floristic plot data (plot 1) within this patch confirmed that the vegetation resembles PCT 3320 (Appendix D). About 65% of the diagnostic species were a match with the vegetation present in the development footprint. Shale Plains Woodland (SPW) had 15 diagnostic species. It had the most number of diagnostic species and was identified as the most appropriate PCT for the vegetation within the subject land.

Several scattered *E. tereticornis* were also mapped within the development footprint. These trees represent part of the Cumberland Plain Woodland TEC and were including in the mapping as part of vegetation zone PCT 3320_mown. These trees (two in the south and two directly south of the large patch) were located within 50 m of each other and had a diameter at breast height greater than 5 cm and a percent foliage cover of 25% of the benchmark. Therefore, the trees did not meet the criteria for listing as scattered trees under Appendix B of the Streamlined assessment module. These trees were therefore mapped as part of vegetation zone 1 PCT 3320_mown.

PCT 4025 Cumberland Red Gum Riverflat Forest was mapped in the western extent of the subject land and will not be directly impacted. It is located along the Werrington Creek which has been subject to rip-rap creek modification works. The vegetation patch is represented by a canopy of *Eucalyptus*

moluccana and *Eucalyptus amplifolia*. The midstorey was absent and groundcover consisted of a thick mulch layer and adjacent areas had exotic grasses such as *Cenchrus clandestinus* (Kikuyu) (Figure 10).

Table 10: PCT selection justification

PCT ID	PCT Name	Selection criteria	Species relied upon for identification of vegetation type and relative abundance
3320	Cumberland Shale Plains Woodland	IBRA region, subregion, soil landscape, elevation and results of floristic plot analysis including the presence of positive diagnostic canopy species. This PCT has previously been mapped by the STVM within the subject land and the subject land (Figure 7).	Presence of <i>Eucalyptus tereticornis</i> , and native <i>Microlaena stipoides</i> and <i>Dichondra repens</i> in ground layer. This PCT is a strong match.

4.3.2 Vegetation zones

A description of the vegetation zones is provided in Table 11. The location of vegetation zone is shown in Figure 16. Photos of the vegetation identified within the development footprint are shown below.

Table 11: Vegetation zones in development footprint

Veg zone	PCT	Condition	Total area (ha)	Description
1	3320 Cumberland Shale Plains Woodland	Mown	0.02	A patch of remnant native vegetation was mapped as vegetation zone 1 along the northern boundary of the development footprint. Several <i>Eucalyptus tereticornis</i> were noted in this vegetation zone (Figure 9). No mid storey was present. Patches of native ground cover species were also recorded such as <i>Microlaena stipoides</i> and <i>Dichondra repens</i> .
-	Planted Native Vegetation	-	0.19	Planted natives includes two <i>Callistemon viminalis</i> located adjacent to hardstand near vegetation zone 1. Planted natives also includes rows of immature <i>Corymbia</i> cultivates planted along the carpark for the recently built shopping carpark complex (Figure 11).
-	Exotic	-	0.55	Exotics consists of a row of mature <i>Populus deltoides</i> (Eastern Cottonwood) (Birds Tree Consultancy 2024) with tree hollows. A small patch of Oleanders and woody weeds <i>Olea europaea</i> subsp. <i>Cuspidata</i> was also present (Figure 12).
-	Exotic Grass	-	2.99	Exotic grass is dominated >75% by <i>Cenchrus clandestinus</i> (Kikuyu Grass) and represented within the south-eastern portion of the development footprint. Exotic grass are regularly mown and lacks native species within the canopy, shrub or ground layer (Figure 13).
-	Built areas		2.07	This includes the existing carpark and roads.
TOTAL			5.82	



Figure 9: Vegetation zone 1 PCT 3320 Cumberland Shale Plains Woodland_mown – start of vegetation integrity plot 1



Figure 10: PCT 4025 Cumberland Red Gum Riverflat Forest (low) located adjacent to the development footprint



Figure 11: Planted native vegetation (*Corymbia cultivars*) in the carpark area to be redeveloped



Figure 12: Dense patches of woody weeds mapped as exotic vegetation



Figure 13: Cleared lands with exotic grasses mapped as exotic grass



Figure 14: Concrete drain mapped as 1st order stream within the development footprint

4.4 Threatened Ecological Communities Justification

The BioNet Vegetation Classification lists PCT 3320 as a component of Cumberland Plain Woodland which is listed as critically endangered under the BC Act and as critically endangered as part of *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest under the EPBC Act* (Table 12).

4.4.1 BC Act listing

The patch of PCT 3320 mapped within the development footprint meets the criteria for listing under the BC Act for the following reasons:

- The development footprint is located within the Sydney Basin bioregion, within the Cumberland Plain.
- The development is located on clay soils derived from Wianamatta Group geology.
- The vegetation contains representative species such as *Eucalyptus tereticornis* which are diagnostic for this TEC.

4.4.2 EPBC Act listing

The large patch of PCT 3320 also meets the criteria for listing under the EPBC Act as it is approximately 1 ha in size and contains perennial understorey of >50 % native species. The patch of PCT 3320 is mapped within the development footprint is contiguous with the adjoining land to the north. As such the EPBC Act assessment considers the vegetation within the development footprint and adjoining land to the north to determine the patch size. Therefore, the vegetation patch satisfies listing under the EPBC Act as Category A (Table 13).

It is noted, that the three isolated *Eucalyptus tereticornis* located in the central and southern portion of the subject (0.02 ha) did not meet the criteria for listing under the EPBC Act as these trees were located more than 100 m from the patch of vegetation, was dominated by exotic grasses in the understorey and was disconnected from the patch of vegetation in the north of the development footprint. The isolated trees do, however, satisfy the criteria for listing under the BC Act.

Table 12: Threatened Ecological Communities

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Area (ha)	Listing status	Name	Area (ha)
3320	CEEC	Cumberland Plain Woodland	0.34	CEEC*	Cumberland Shale Plains Woodland and Shale-Gravel Transition Forest	0.34

* THE NORTHERN PORTION OF VEGETATION ZONE 1 SATISFIES LISTING UNDER THE EPBC ACT.

Table 13: Condition thresholds for patches that meet the definition of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest critically endangered ecological community

Category and rationale	Thresholds
A. Core thresholds that apply under most circumstances: patches with an understorey dominated by natives and a	Minimum patch size is ≥ 0.5 ha; AND

Category and rationale	Thresholds
minimum size that is functional and consistent with the minimum mapping unit size applied in NSW.	≥50% of the perennial understorey vegetation cover is made up of native species.
OR	
B. Larger patches which are inherently valuable due to their rarity	The patch size is ≥5 ha; AND ≥ 30% of the perennial understorey vegetation cover is made up of native species
OR	
C. Patches with connectivity to other large native vegetation remnants in the landscape	The patch size is ≥0.5 ha; AND The patch is contiguous with a native vegetation remnant (any native vegetation where cover in each layer present is dominated by native species) that is ≥ 5 ha in area.
OR	
D. Patches that have large mature trees or trees with hollows (habitat) that are very scarce on the Cumberland Plain.	The patch size is ≥ 0.5 ha in size; AND ≥ 30% of the perennial understorey vegetation cover is made up of native species; AND The patch has at least one tree with hollows per hectare or at least one large tree (≥80 dbh) per hectare from the upper tree layer species.

4.4.3 Threatened Ecological Community outside the development footprint

The subject land contains PCT4025 *Cumberland Red Gum Riverflat Forest* in the west of the development footprint (Figure 15). PCT 4025 is associated with the following TECs:

- *River-flat eucalypt forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* listed as an endangered ecological community under the BC Act.
- *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria* listed as a critically endangered ecological community under the EPBC Act.

It is noted that no direct impacts are expected to occur to this TEC. Any potential effects will be mitigated through effective control measures. An assessment of the TEC under the BC Act and EPBC Act is provided below.

4.4.4 BC Act listing

According to the final determination for this TEC, vegetation mapped as *River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* occurs on loam soils on alluvial flats (NSW Scientific Committee 2011). PCT 4025 within the subject land was located along Werrington Creek which is located on alluvial flats. The patch of PCT 4025 recorded within the subject land contains species such as *Eucalyptus moluccana* which is listed as a characteristic species of this TEC. Paragraph 3 of the final determination states that this TEC occurs in LGAs which includes the current subject land, Penrith City Council. Therefore, the vegetation mapped as PCT 4025 represents part of the endangered ecological community *River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions*.

4.4.5 EPBC Act listing

The criteria for listing under the EPBC Act is more stringent and includes larger patches of high quality vegetation with high species diversity. According to the listing criteria under the EPBC Act, the vegetation within the subject land did not satisfy the listing criteria (Table 14). The vegetation within the subject land lacked native underground and midstorey species (Figure 10).

Table 14: Condition classes and thresholds for the ecological community

Patch size thresholds →	Large patch Patch size ≥ 2 ha	Small contiguous ⁷ patch Patch size ≥ 0.5 ha within a larger area of native vegetation ≥ 5 ha	Small patch Patch size ≥ 0.5 ha
Biotic thresholds ↓			
High condition ≥ 80% of its total perennial understorey vegetation cover ¹ is comprised of native species AND Ground cover richness ² ≥ 10 native species per sample plot AND ≥ 20 large trees ³ per ha	CLASS A1 Large or contiguous patch in high condition		CLASS B1 Small patch in high condition
Good condition with arboreal mammals ≥ 50% of its total perennial understorey vegetation cover ¹ is comprised of native species AND Ground cover richness ² ≥ 6 native species per sample plot AND At least 10 large trees ³ per ha AND Evidence of 4 or more species of arboreal mammals ⁴ detected ⁵ in the patch	CLASS A2 Large or contiguous patch in good condition with arboreal mammals		CLASS B2 Small patch in good condition with arboreal mammals
Good condition ≥ 50% of its total perennial understorey vegetation cover ¹ is comprised of native species AND Ground cover richness ² ≥ 6 native species per sample plot AND At least 10 large trees ³ per ha	CLASS B3 Large or contiguous patch in good condition		CLASS C1 Small patch in good condition
Moderate condition ≥ 30% of its total perennial understorey vegetation cover ¹ is comprised of native species AND Ground cover richness ≥ 4 native species per sample plot ²	CLASS C2 Large or contiguous patch in moderate condition		
<p>¹ Perennial understorey vegetation cover includes vascular plant species of all layers below the canopy with a life-cycle of more than two growing seasons. It includes herbs (graminoids and forbs), grasses, shrubs and juvenile plants of canopy species, but does not include annual plants, cryptogams, plant litter or exposed soil.</p> <p>² Ground cover richness includes combined species richness of native grasses, forbs, ferns and sedges per 0.04 ha (20 x 20 m sample plot).</p> <p>³ Large eucalypt trees are greater than 45 cm [diameter at breast height (dbh)]. This is used as a surrogate for tree hollows and habitat values.</p> <p>⁴ Excluding micro-bats (Microchiroptera).</p> <p>⁵ Survey guidelines (DSEWPC 2011).</p> <p>⁷ Contiguous means the patch is connected to, or in close proximity to (i.e. within 30 m of), another area of native vegetation (i.e. an area where the total perennial vegetation cover is dominated (50 percent or more) by native plant species).</p>			

4.5 Vegetation integrity assessment

A vegetation integrity assessment using the Credit Calculator (BAMC) was undertaken and the results are outlined in Table 15.

Table 15: Vegetation integrity in the development footprint

Veg Zone	PCT ID	Condition	Area impacted (ha)	Composition Condition Score	Structure Condition Score	Function Condition Score	Current vegetation integrity score
1	3320	Mown	0.02	43.5	67.2	63.8	57.1

4.5.1 Use of local data

The use of local data is not proposed for this assessment.

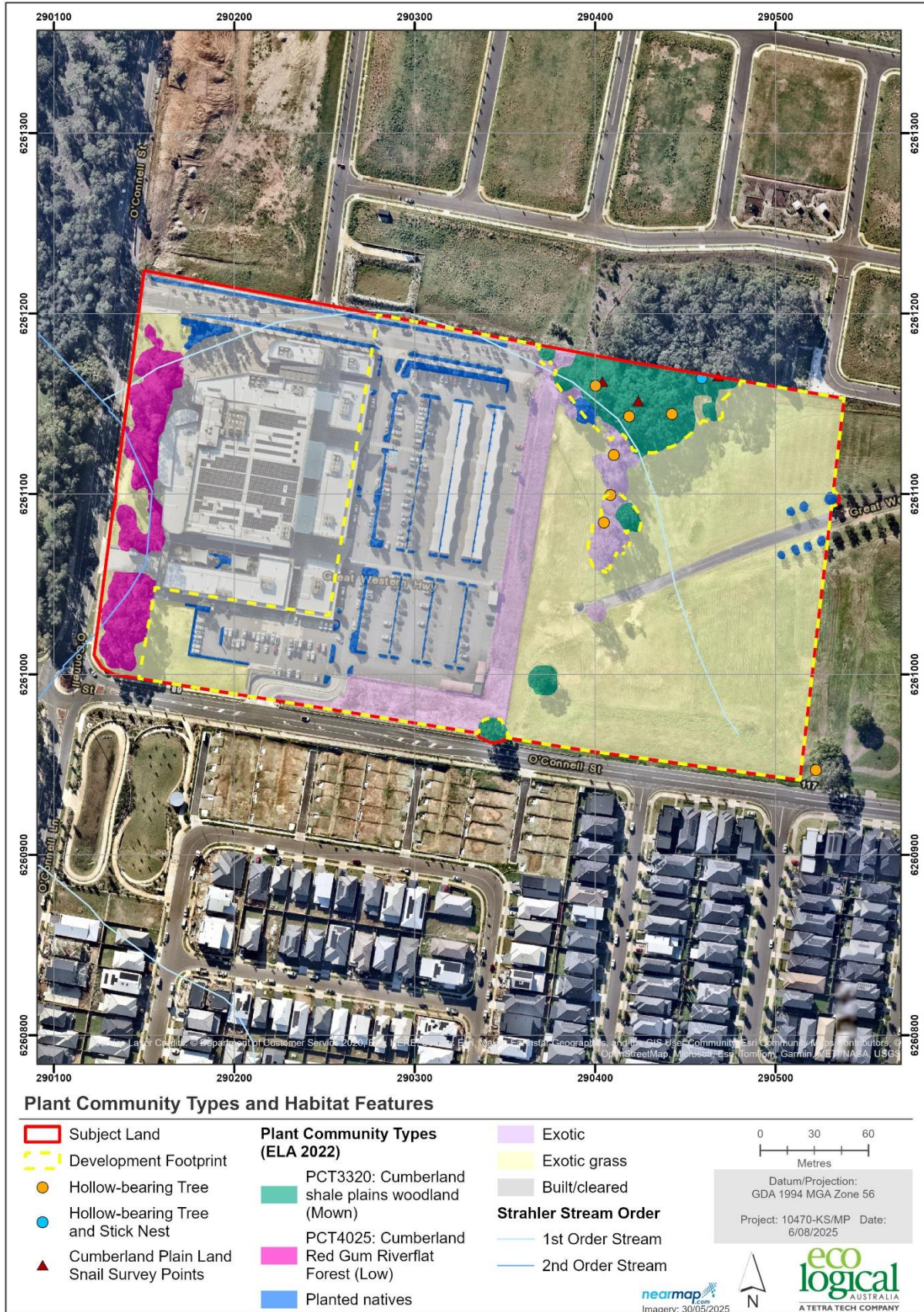


Figure 15: Plant Community Types and habitat features



Figure 16: Plot locations and vegetation zones

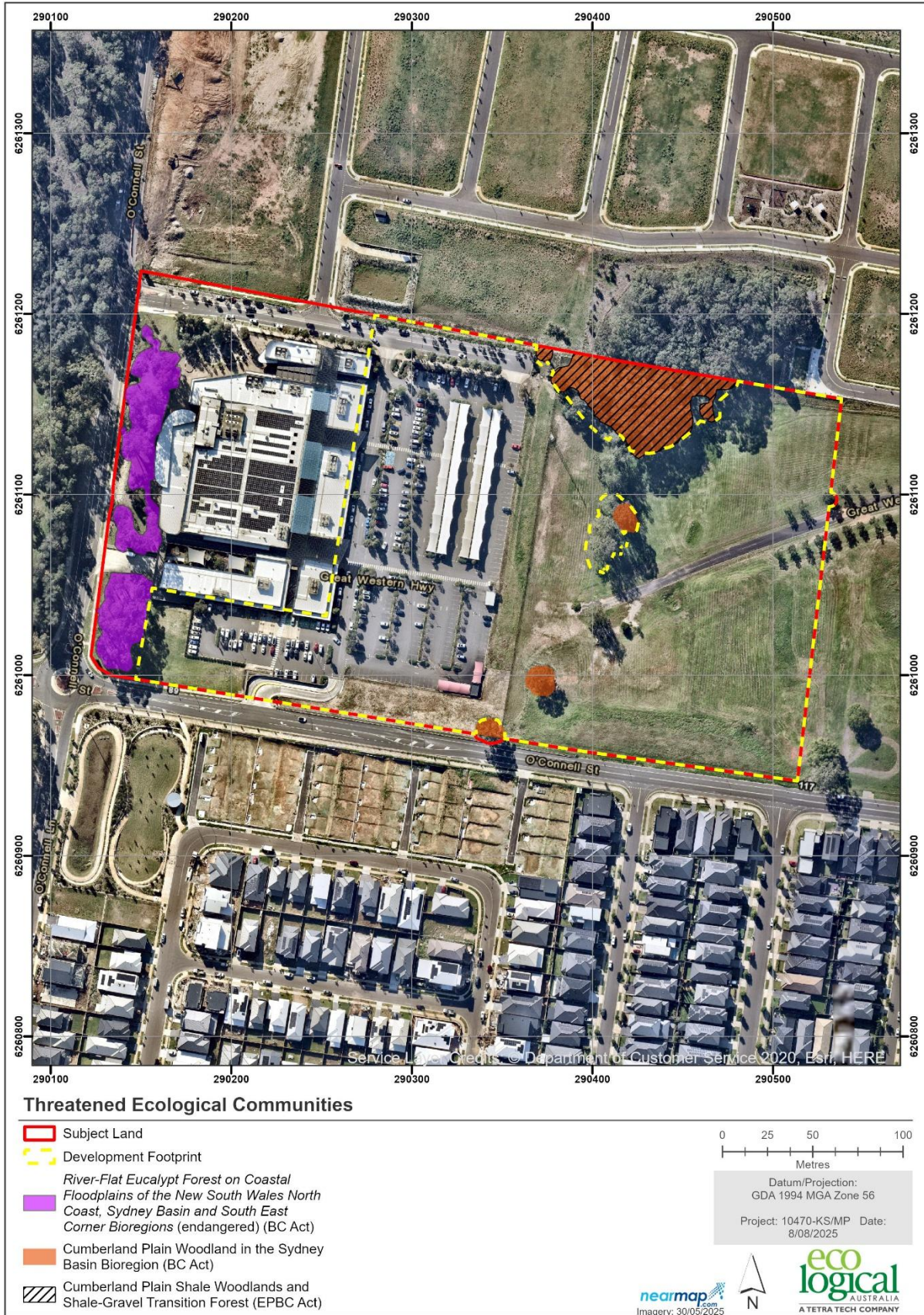


Figure 17: Threatened Ecological Communities

5. Threatened species

5.1 Ecosystem credit species

Ecosystem credit species predicted to occur within the development footprint are generated by the BAMC following the input of vegetation integrity plot data and the PCTs identified within Appendix C. Ecosystem credit species predicted to occur at the development footprint, their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 16.

Table 16: Predicted ecosystem credit species and relevant justification for their exclusion or inclusion from the assessment

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act listing status	Justification for exclusion or inclusion
<i>Anthochaera phrygia</i>	Regent Honeyeater (Foraging)	N/A	High	Critically Endangered	Critically Endangered	Included The subject land contains low quality habitat for this species.
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	N/A	Moderate	Vulnerable	Not Listed	Included Habitat features for this species are present at in the subject land.
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo (Foraging)	N/A	Moderate	Endangered	Endangered	Included The subject land contains low quality habitat for this species.
<i>Calyptorhynchus lathami lathami</i>	South-eastern Black-Cockatoo	Glossy Other – Presence of <i>Allocasuarina</i> and <i>casuarina</i> species.	High	Vulnerable	Vulnerable	Excluded <u>The subject land did not contain vegetation which includes <i>Allocasuarina</i> or <i>Casuarina</i> species. This habitat features was absent from the vegetation within the subject land.</u>
<i>Chthonicola sagittata</i>	Speckled Warbler	N/A	High	Vulnerable	Not Listed	Included This species may utilise the vegetation within the subject land on occasion for foraging habitat.
<i>Circus assimilis</i>	Spotted Harrier	N/A	Moderate	Vulnerable	Not Listed	Included This species may utilise the vegetation within the subject land on occasion for foraging habitat.
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	N/A	High	Vulnerable	Vulnerable	Included This species inhabits open forests and woodlands. Fallen timber is considered an important habitat requirement for this species, however, are absent from the subject land. The site provides marginal habitat for

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act listing status	Justification for exclusion or inclusion
						this species. Furthermore, there are no BioNet records for this species within a 5 km radius of the subject land.
<i>Daphoenositta chrysoptera</i>	Varied Sittella	N/A	Moderate	Vulnerable	Not Listed	Included This species may utilise the vegetation within the subject land on occasion for foraging habitat.
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	N/A	High	Vulnerable	Endangered	Included This species requires habitat features such as maternal den sites, an abundance of food (birds and small mammals) and large areas of relatively intact vegetation to forage. There is one record for this species within a 5 km radius of the subject land. This species may traverse the subject land to other habitats or utilise the subject land on occasion.
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	Swamps – within 300 m of shallow, open freshwater or saline wetlands or shallow edges of deeper wetlands. Waterbodies – within 300 m of shallow lakes, lake margins and estuaries.	Moderate	Endangered	Not Listed	Included Werrington Creek within the Western Sydney University Kingswood campus to the west of the subject land contains an open waterbody. Therefore, marginal habitat is present within 300 m of the subject land and this species was included in this assessment.

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act listing status	Justification for exclusion or inclusion
<i>Falco subniger</i>	Black Falcon	N/A	Moderate	Vulnerable	Not Listed	<u>Included</u> This species may utilise the vegetation within the subject land on occasion for foraging habitat.
<i>Glossopsitta pusilla</i>	Little Lorikeet	N/A	High	Vulnerable	Not Listed	<u>Included</u> There is one BioNet records for this species within a 5 km radius of the subject land. This species may utilise the flowering species within the subject land for seasonal foraging.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle (Foraging)	Waterbodies Within 1 km of rivers, lakes, large dams or creeks, wetlands and coastlines	High	Vulnerable	Not Listed	<u>Included</u> There is one BioNet records for this species within a 5 km radius of the subject land. The subject land it is located within 1 km of Werrington Creek.
<i>Hieraaetus morphnoides</i>	Little Eagle (Foraging)	N/A	Moderate	Vulnerable	Not Listed	<u>Included</u> There are two BioNet records for this species within a 5 km radius of the subject land. The subject land contains potential foraging habitat for this species.
<i>Hirundapus caudacutus</i>	White-throated Needletail	N/A	High	Vulnerable	Vulnerable	<u>Included</u> The subject land contains low quality habitat for this species.
<i>Lathamus discolor</i>	Swift parrot (Foraging)	N/A	Moderate	Endangered	Critically Endangered	<u>Included</u> On mainland Australia this species utilises <i>Eucalyptus tereticornis</i> which was recorded in PCT 3320 vegetation zone 1. There are 108 BioNet records for this species within a 5 km radius of the subject land.

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act listing status	Justification for exclusion or inclusion	
<i>Lophoictinia isura</i>	Square-tailed (Foraging)	Kite	N/A	Moderate	Vulnerable	Not Listed	<u>Included</u> There are two BioNet records for this species within a 5 km radius of the subject land. The subject land contains potential foraging habitat for this species.
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)		N/A	Moderate	Vulnerable	Not Listed	<u>Included</u> This species inhabits dry woodlands dominated by box species or ironbark eucalypts. Habitat features for this species are limited but present in the subject land. There are no BioNet records for this species within a 5 km radius of the subject land.
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat		N/A	High	Vulnerable	Not Listed	<u>Included</u> Seasonal foraging habitat was identified in this assessment. There are eight BioNet records for this species within a 5 km radius of the subject land.
<i>Miniopterus australis</i>	Little Bent-winged-Bat (Foraging)		N/A	High	Vulnerable	Not Listed	<u>Included</u> Seasonal foraging habitat was identified in this assessment. There is one BioNet record for this species within a 5 km radius of the subject land.
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat (Foraging)		N/A	High	Vulnerable	Not Listed	<u>Included</u> Seasonal foraging habitat was identified in this assessment. There are 66 BioNet records for this species within a 5 km radius of the subject land.
<i>Neophema pulchella</i>	Turquoise Parrot		N/A	High	Vulnerable	Not Listed	<u>Included</u> This species is associated with woodlands and feeds on seeds and herbs in grasslands. Suitable foraging habitat is present in the subject land.

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act listing status	Justification for exclusion or inclusion
						There are no BioNet records for this species within a 5 km radius of the subject land.
<i>Pandion cristatus</i>	Eastern Osprey (foraging)	N/A	Moderate	Vulnerable	Not Listed	Included This species may utilise the vegetation within the subject land on occasion.
<i>Petroica boodang</i>	Scarlet Robin	N/A	Moderate	Vulnerable	Not Listed	Included This species has been included as a candidate species as during autumn and winter individuals may move to grasslands or grazed paddocks with scattered trees. There is one BioNet record for this species within a 5 km radius of the subject land.
<i>Petroica phoenicea</i>	Flame Robin	N/A	Moderate	Vulnerable	Not Listed	Included This species utilises open understorey habitat for foraging. Breeding habitat occurs in ridgetops in tall moist forests. The subject land contains potential foraging habitat for this species. There are no BioNet records for this species within a 5 km radius of the subject land.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox (Foraging)	N/A	High	Vulnerable	Vulnerable	Included Limited foraging resources were present within the development area for this highly mobile species. This species may occasionally utilise the Eucalyptus species during flowering seasons to supplement foraging resources. There are 244 BioNet records for this species within a 5 km radius of the subject land.
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail-bat	N/A	High	Vulnerable	Not Listed	Included

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act listing status	Justification for exclusion or inclusion
						Seasonal foraging habitat was identified in this assessment. There is one BioNet record for this species within a 5 km radius of the subject land.
<i>Stagonopleura guttata</i>	Diamond Firetail	N/A	Moderate	Vulnerable	Vulnerable	Included This species feeds exclusively on the ground for grasses and herbs in woodland environments including derived grasslands. The subject land contains suitable foraging habitat for this species. There are two BioNet records within 5 km radius of the subject land.
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	N/A	High	Vulnerable	Not Listed	Included This species may utilise the vegetation within the subject land on occasion for foraging habitat.

5.2 Fauna surveys and habitat assessment

For Streamlined Assessment Module – Small Areas, a targeted survey is only required for species credit species which are Serious and Irreversible Impacts (SAIL) entities.

It is noted that the BAM C currently does not provide an option to assess Major Projects using the Small Areas assessment. Correspondence with the BOS helpdesk for another Major Project confirmed that the species credit species list can be manually refined so only SAIL entities are considered for Small Areas assessments (Appendix E).

The site visit on 3 June 2022 by Belinda Failes involved an assessment of potential habitat for threatened flora and fauna species.

Habitat assessments involved a search of important habitat features for threatened fauna species, such as hollow-bearing trees, rocky outcrops (if present) and deep leaf litter. Assessments also included a search of evidence of fauna foraging or roosting such as chewed cones, sap trees or roosting habitat in the form of white wash/pellets, plus inspection of structures to determine of suitable roosting/breeding habitat for threatened microbats. Binoculars were used to inspect tree hollows. No hollows inspected displayed any apparent visual evidence of microbat occupation.

A targeted survey for one threatened fauna species, *Meridolum corneovirens* (cumberland plain land snail) was conducted within the remnant vegetation in the north (Figure 15). This species is not a SAIL entity, however, the survey was conducted to determine the presence of this species for the initial constraints analysis of the development. Surveys involved gently raking the leaf litter by hand away from the base of *Eucalyptus tereticornis*. No individuals were recorded and no habitat was identified as suitable due to the regular mowing practices and lack of habitat features including accumulated leaf litter and fallen logs (Figure 18). The locations of survey points are provided in Figure 15.

The survey also identified six hollow bearing trees within the subject land. One hollow-bearing tree within exotic vegetation (*Populus deltoides*) will be removed (Figure 19). Three hollow-bearing trees will be retained within the PCT 3320 mown vegetation zone and two in the exotic vegetation (Figure 15). Microbat use and/or markings were not observed around any of the tree hollow entrances, nor were any microbats observed when inspecting inside the accessible hollows.

A medium sized stick nest was recorded in PCT 3320 in the northern boundary of the development footprint (Figure 20). Several *Corvus coronoides* (Australian ravens) were observed in the tree near the nest during the field survey in June 2022. The nest is not a large stick pile and the nest is located at the outer branches of the tree. More than one raven was observed near the nest. Thus, it can be determined with reasonable certainty that the stick nest does not belong to a large threatened species such as little eagle, square-tailed kite, osprey, white-bellied sea eagle, black falcon or spotted harrier. Additionally, the nest will not be removed from the site.

Macropus giganteus (eastern grey kangaroos) were observed foraging within the subject land and adjoining land to the north. The subject land provides supplementary foraging habitat (native grasses such as *Microlaena stipodites*) for this species. The adjacent land to the north also provides suitable foraging and sheltering habitat for this species. The eastern grey kangaroo is not listed as threatened species under the BC Act/EPBC Act and therefore this species is not included as an ecosystem or species

credit species. However, the species is still protected under the BC Act and consideration of the impacts of the proposed development on the population is required. Consideration of the cumulative impacts due to the development within the land to the north has identified that the proposed works is likely to negatively impact upon this species. A Fauna Management Plan has been prepared to provide mitigation measures for the population of kangaroos during construction (ELA 2025b).



Figure 18: Example of survey location for Cumberland Plain Land Snail. No snails were recorded and limited habitat present.



Figure 19: Small hollow within exotic vegetation within the subject land to be removed



Figure 20: Stick nest identified within vegetation to be retained in the subject land

5.3 Species credit species

Species credit species predicted to occur at the development footprint (i.e. candidate species), their associated habitat constraints, geographic limitations and sensitivity to gain class is included in Table 17. As the works are assessed in accordance with Streamline Assessment Module – Small Areas, only candidate species that are at risk of a Serious and Irreversible Impact (SAII) have been included in the assessment.

As previously the BAM C does not provide an option to assess Major Projects using the Small Areas assessment. The species credit species list was manually refined so only SAII entities are considered for Small Areas assessments (Appendix E).

No species credit species were incidentally identified during habitat assessments conducted in 2022, nor are these species expected to occur based on a lack of suitable habitat and lack of evidence of occupation. The trees within the development footprint may be used as potential seasonal foraging habitat for the Grey-headed flying-fox, and the hollows may potentially be used as temporary roosting habitat for microbats, however it is highly unlikely that the development footprint contains suitable breeding habitat for these species.

The development footprint is located within a highly urbanised environment, exposed and open, with little habitat features present. The vegetation within the development footprint is a considerably fragmented and disturbed example of Cumberland Plain Woodland (PCT 3320) which will be largely retained. The development footprint is also located a considerable distance from core bushland, and no naturally functioning watercourses are present within the vicinity. It is more likely that suitable breeding habitat would be present outside the development footprint in these core areas.

Table 17: Candidate species credit species

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status	Justification if species excluded
<i>Anthochaera phrygia</i>	Regent Honeyeater (Breeding)	As per Important Habitat Map.	High	Critically Endangered	Critically Endangered	<u>Excluded</u> The subject land is not mapped on the BAM important areas map (accessed 1 July 2025)
<i>Chalinolobus dwyeri</i>	Large-eared Bat	Pied Cliffs Within two km of rocky areas containing caves, overhangs, escarpment, outcrops, or crevices or within two km of old mines or tunnels	Very High	Endangered	Endangered	<u>Excluded</u> SAIL assessment for this species applies to 100 m buffer around breeding habitat. No potential breeding habitat is present within 100 m of the development footprint; therefore, the development does not pose a risk of SAIL, and no further assessment is required. Furthermore, there was no potential breeding habitat (i.e., cliffs, caves, rocky areas with outcrops, overhangs, escarpments or crevices) present within a two kilometre radius of the subject land (as determined by aerial imagery).
<i>Deyeuxia appressa</i>		N/A	High	Endangered	Endangered	<u>Excluded</u> The subject land is substantially degraded and does not contain suitable habitat features for this species. It is noted from the TBDC that there are no records of this species since 1942. The NSW government website, Plantnet has recently been updated (early 2025). It is now understood that <i>Deyeuxia appressa</i> was only

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status	Justification if species excluded
						historically recorded near the Georges River in southern Sydney.
<i>Eucalyptus benthamii</i>	Camden Gum	White N/A	High	Critically Endangered	Critically Endangered	<u>Excluded</u> The subject land is substantially degraded and therefore, does not provide suitable habit for this species. This species can be surveyed any time of year. Therefore, this species would have been identified during 2022 field surveys
<i>Lathamus discolor</i>	Swift (Breeding)	Parrot Other As per mapped areas	Moderate	Endangered	Critically Endangered	<u>Included</u> A small portion of the subject land is located on the Important Habitat maps (accessed 1 July 2025). Therefore, in accordance with the TDBC this species is assumed present within the development site and a species polygon is required. This species is a dual credit species and only areas critical to the life stage of the swift parrot are included as species credits.
<i>Micromyrtus minutiflora</i>		N/A	High	Endangered	Vulnerable	<u>Excluded</u> The subject land is substantially degraded, is fragmented from other areas of vegetation and does not contain suitable habit features for this species.

Species	Common Name	Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status	Justification if species excluded
<i>Miniopterus australis</i>	Little Bent-winged Bat (Breeding)	Caves Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave' Observation type code 'E nest-roost' With numbers of individuals > 500 Or from the scientific literature	Very High	Vulnerable	Not Listed	<u>Excluded</u> The subject land or land within 100 m of the development footprint did not contain caves, tunnels, mines, culverts or other structures known or suspected to be used for breeding by the species.
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat (Breeding)	Caves Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave' Observation type code 'E nest-roost' With numbers of individuals > 500 Or from the scientific literature	Very High	Vulnerable	Not Listed	<u>Excluded</u> The subject land or land within 100 m of the development footprint did not contain caves, tunnels, mines, culverts or other structures known or suspected to be used for breeding by the species.

Species	Common Name		Habitat constraints / Geographic limitations	Sensitivity to gain class	BC Act listing status	EPBC Act Listing status	Justification if species excluded
<i>Pterostylis saxicola</i>	Sydney Greenhood	Plains	N/A	Very High	Endangered	Endangered	<p><u>Excluded</u></p> <p>The subject land is substantially degraded, is fragmented from other areas of vegetation and does not contain suitable habitat features for this species. According to the final determination for this species, it occurs on sandstone rock shelves above cliff lines and has been recorded from five localities being Georges River National Park, Ingleburn, Holsworthy, Peter Meadows Creek and St Marys Towers (NSW Scientific Committee 1997). The subject land does not provide these habitat features and is not within these localities.</p>

5.3.1 Assessment of habitat constraints and vagrant species

Habitat for any candidate species derived by the BAMC are not considered likely to occur within the development footprint based on the lack of habitat and long-term habitat degradation throughout the development footprint (justification provided in Table 17, above).

No other candidate species (in addition to those generated by the BAMC) are considered likely to occur within the development footprint and no further assessment is required.

5.3.2 Candidate species requiring further assessment – assume presence

As this BDAR is being assessed via the streamlined (small area) assessment (BAM 2020, Appendix C), only those candidate species at risk of a serious and irreversible impact (SAII) require targeted survey. All the candidate species generated by the BAMC (Table 17) are entities at risk of a SAII. However, as there is no breeding habitat present within the development footprint for the fauna species (*Miniopterus australis* and *M. orianae oceanensis*) no targeted survey is required for these species. No candidate flora species was included during field surveys (3 June 2022). One candidate fauna species (swift parrot) has included for assessment as a portion of the NSW DCCEEW important habitat is present on the development footprint.

Species credit species where presence has been assumed due to habitat assessment as likely to be present is provided in Table 18.

Table 18: Species credit species where presence has been assumed or survey conducted

Target species	Common name	BAM survey period	Species credit required / species polygon justification methodology for species polygon
<i>Lathamus discolor</i>	Swift parrot	N/A	A small portion of the development footprint is located on the Important Habitat maps (accessed 1 July 2025). Therefore, in accordance with the TDBC this species is assumed present within the development footprint and a species polygon is required. This species is a dual credit species and only areas critical to the life stage of the Swift parrot are included as species credits.

5.3.3 Species credit species included in this assessment

One species credit species (swift parrot) was included in this assessment area provided below. The Important Habitat map includes areas identified in field surveys as planted native vegetation (0.013 ha), exotic vegetation (0.09 ha), exotic grass (0.187 ha) and built areas (0.02 ha). The mapping from the Biodiversity Offsets Agreement Management System (BOAMS) is provided in the Species Polygon for Swift parrot in Figure 21. Entry into the BOAMS only included impacts to PCT 3320 (0.002 ha).

Table 19: Species credit species included in this assessment

Species	Common name	Species presence	Geographic limitations	Species descriptions	Species polygon	Number of individuals / habitat (ha)	Biodiversity risk weighting
<i>Lathamus discolor</i>	Swift parrot	Yes (assumed presence)	Mapped areas of Important Habitat as per BOAMS	Areas within the Important Habitat are included in the species polygon. Where suitable habitat located outside of the Important Habitat was identified within the development footprint this has been assessed as ecosystem credits. Species polygon is provided in Figure 21.		0.002	3.00

5.3.4 Expert reports

Expert reports have not been prepared as part of this BDAR.

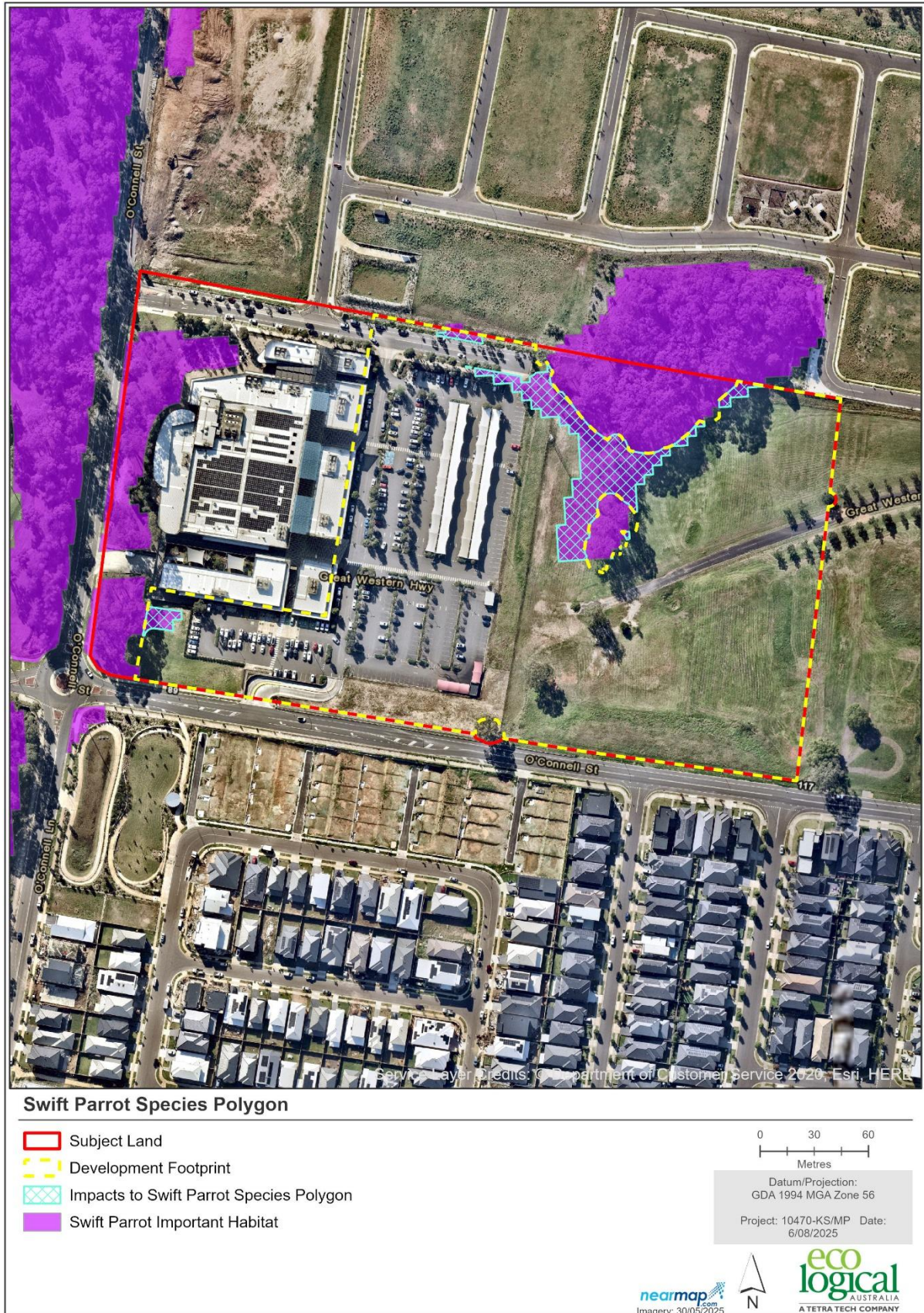


Figure 21: Species polygon (Swift parrot)

5.4 Identification of prescribed additional biodiversity impact entities

5.4.1 Karst, caves, cliffs, rocks and other geological features of significance

The subject land does not contain these features.

5.4.2 Human-made structures and non-native vegetation

The subject land contains human-made structures. The development footprint contains 2.86 ha of open exotic grasses and 1.49 ha of hard stand which does not contain walls or a roof. These areas do not provide any meaningful habitat for threatened species.

Table 20: Assessment of prescribed impacts to human-made structures and non-native vegetation

Criteria in accordance with BAM 2020 Section 6.1.2	Response
2. If human-made structures (e.g. bridges, culverts, abandoned buildings) and non-native vegetation (e.g. camphor laurel trees) provides habitat for threatened species, the assessor must:	
a. provide a description of the type of human-made structure or non-native vegetation habitat	The subject land contains human-made structures in the form of hard-stand concrete carpark areas and roads. These do not provide meaningful habitat for threatened entities. Non-native vegetation present in the subject land includes mature <i>Populus deltoides</i> (Eastern Cottonwood) with tree hollows. Non-native environmental weeds are present, such as Oleanders, woody weeds <i>Olea europaea</i> subsp. <i>cuspidata</i> and <i>Cenchrus clandestinus</i> (Kikuyu Grass).
b. prepare a list of threatened species that use these features as habitat	<ul style="list-style-type: none"> The following species (microbats) may forage above the carpark and built areas <i>Miniopterus australis</i> (little bent-winged bat) <i>Miniopterus oriana oceanensis</i> (large bent-winged bat) Exotic vegetation may be utilised for foraging by <i>Pteropus poliocephalus</i> (grey-headed flying fox).
c. describe how each threatened species could, or does, use the human-made structure or non-native vegetation as habitat (based on published literature and other reliable sources).	As mentioned above, the non-native vegetation may provide supplementary foraging habitat for grey-headed flying-fox and aerial foraging for microbats.

5.4.3 Habitat connectivity

As identified in Table 6, the subject land is largely cleared or built, and connectivity is limited. Some connectivity for highly mobile species may be present between remnant vegetation and areas of planted native vegetation within the development footprint.

The proposed development would retain some habitat connectivity by retaining the patch of remnant vegetation along the northern boundary. An assessment of prescribed impacts to habitat connectivity is presented in Table 21.

Table 21: Assessment of prescribed impacts to habitat connectivity

Criteria in accordance with BAM 2020 Section 6.1.3	Response
2. Where corridors or other areas of connectivity link habitat for threatened entities, the assessor must:	

Criteria in accordance with BAM 2020 Section 6.1.3	Response
<p>a. prepare a list of threatened entities that are likely to use or are a part of the connectivity or corridor</p>	<p>Highly mobile, threatened birds and bats that are likely to utilise the vegetation within the subject land (mostly for supplementary foraging) and were included in this assessment.</p> <p>Mega bats:</p> <ul style="list-style-type: none"> • <i>Pteropus poliocephalus</i> (Grey-headed flying fox) <p>Microchiropteran bats:</p> <ul style="list-style-type: none"> • <i>Falsistrellus tasmaniensis</i> (eastern false pipistrelle) • <i>Miniopterus australis</i> (little bent-winged bat) • <i>Miniopterus orianae oceansis</i> (large bent-winged bat) • <i>Scoteanax rueppellii</i> (greater broad-nosed bat). <p>Birds, including:</p> <ul style="list-style-type: none"> • <i>Glossopsitta pusilla</i> (little lorikeet) • <i>Ninox strenua</i> (powerful owl). <p>Migratory species (birds):</p> <ul style="list-style-type: none"> • <i>Anthochaera phrygia</i> (regent honeyeater) • <i>Lathamus discolor</i> (swift parrot).
<p>b. describe the importance of the connectivity to threatened entities, particularly for maintaining movement that is crucial to the species' life cycle</p>	<p>The subject land is located within a fragmented landscape. It contains limited native vegetation, except a patch of remnant vegetation in the north of the development footprint. This patch is contiguous with native vegetation patch in the adjoining lands to the north. The patch is approximately 0.9 ha in size and is disconnected from other patches of native vegetation due to major arterial roads, development and extensive exotic grasslands.</p> <p>There is a narrow connective vegetation outside of the development footprint along the tributaries of Werrington Creek in the west which may facilitate movement of some highly mobile species which may move between tracts of native vegetation.</p> <p>The vegetation within the development footprint may act as part of the stepping-stone habitat which may assist in facilitating the movement of threatened species. This is limited to highly mobile species which can move through urban areas. Therefore, the vegetation within development footprint is part of a series of stepping-stone habitat, but on its own, it does not maintain movement that is crucial to a threatened species life cycle.</p>

5.4.4 Water bodies, water quality and hydrological processes

The development footprint contains a mapped 1st order Strahler stream. The field survey identified that this watercourse is currently partially concrete along the north portion of the development footprint (Figure 14). The headwaters in the south, consist of a grassy swale of exotic and mown grasses. The watercourse follows the contours of the landscape; however, it does not contain semi-aquatic vegetation, or standing water or a defined 'bed and bank'. This watercourse does not provide habitat to threatened fauna species.

The development footprint does not contain mapped Groundwater Dependent Ecosystems based on a desktop review of the BOM groundwater dependent ecosystems map (BOM 2022).

An assessment of prescribed impacts to water bodies, water quality and hydrological processes is presented in Table 22.

Table 22: Assessment of prescribed impacts to water bodies, water quality and hydrological processes

Criteria in accordance with BAM 2020 Section 6.1.4	Response
1. Where water bodies or any hydrological processes that sustain threatened entities occur on the subject land, the assessor must:	
<ul style="list-style-type: none"> a. prepare a list of threatened entities that may use or depend on water bodies or hydrological processes for all or part of their life cycle, or b. prepare a list of threatened entities that will be, or are likely to be impacted by changes to existing water bodies or hydrological processes or the construction of a new water body 	<p>There were no threatened entities identified which would utilise the modified 1st order Strahler stream mapped within the development footprint.</p> <p>As previously stated, the northern portion of the watercourse consists of an open concrete lined channel. The headwaters consist of a regularly mown grassy swale which lacks a defined bed and bank. No permanent standing water or semi-aquatic vegetation was identified within the watercourse. The watercourse may receive surface water overflow during peak rainfall events and the water may naturally follow the contours which leads to the concrete channel.</p> <p>The proposed development of the site will alter the current topography through cut and fill and will create new gabion walls as part of changes to hydrological flows within the development footprint. These changes are not likely to impact upon threatened entities as no threatened entities were identified which depend upon the hydrological flow or waterbodies in the development footprint.</p> <p>Although PCT 3320 located in the north of the development footprint is not a threatened entity which is dependent upon hydrological flows, it is noted that changes to the development footprint is likely to result in indirect changes to the flow regime and water quality. Stormwater basins and revegetation has been included in the landscape design to minimise changes to current hydrological flow into the northern patch of PCT 3320.</p>
<ul style="list-style-type: none"> c. describe the habitat provided for each threatened entity by the water body or hydrological process, including consideration of water quality, volume, flow paths and seasonal patterns 	<p>Hydrological assessments have not been undertaken as part of this assessment.</p> <p>As stated above, no threatened entities were identified which are likely to utilise the watercourse mapped within the development footprint.</p>

5.4.5 Wind farm developments

The proposed development is not a wind farm development.

5.4.6 Vehicle strikes

The proposed development will result in an increase in vehicle movement within the subject land. There could be an increased risk of vehicle strike on threatened species and other native fauna. Increase in risk

of vehicle strike is most likely to impact upon nocturnal species. Mitigation measures to reduce impacts to native fauna species have been included in Table 33.

6. Avoiding and Minimising Impacts on biodiversity values

The BAM requires locating and designing a project to avoid and minimise direct and indirect impacts on biodiversity values and prescribed biodiversity impacts. The project was redesigned in February 2024 as a response to biodiversity values. A summary of the changes and the implication to biodiversity are provided below:

- removal of one of the proposed buildings (Building A) and a reduction in the asset protection zone to be contained entirely within the development footprint (ELA 2024).
- removal of the elevated boardwalk through the threatened ecological community in the north, as such a further reduced in the impact to PCT 3320 from 0.09 ha to 0.02 ha.
- the entire EPBC-listed patch of PCT 3320 in the north of the subject land will be preserved.
- a *E. tereticornis* tree located on the southern boundary, which conforms PCT 3320, will be retained and therefore excluded from the development footprint.
- the redesign has reduced the impact on swift parrot important habitat within PCT 3320 from 0.05 ha to 0.002 ha.
- two additional hollow-bearing trees within exotic vegetation will be retained as part of the new design.
- the redesign does not impact upon PCT 4025 which is also listed as a TEC.

Overall, the redesign of the proposed development footprint has demonstrated the avoid and minimise impacts to biodiversity values.

6.1 Locating a project to avoid and minimise impacts on vegetation and habitat

The project will result in the removal of a small amount of native vegetation and planted native vegetation from within the subject land. However, the proposed development has avoided and minimised direct and prescribed impacts on biodiversity by retaining the majority of the large patch of remnant vegetation in the north and a *E. tereticornis* tree in the south and utilising previously cleared areas. This development has also been designed in a way to avoid and minimise impacts. These matters have been addressed in Table 23.

Table 23: Locating a project to avoid and minimise impacts on vegetation and habitat

Approach	How addressed and justification
Locating the project in areas lacking biodiversity values	<p>The project has located the development within areas of previously and current disturbed native vegetation and exotic vegetation. The proposed development footprint is approximately 5.82 ha and of which, 5.80 ha is located within previously cleared lands (2.07 ha of built, 0.55 ha of exotic, 2.99 ha of exotic grass and 0.19 ha of planted natives) which lacks biodiversity values. Therefore, the development is located on 99% land which contains limited or no biodiversity values. Areas of low biodiversity values demonstrate measures to avoid and minimise impacts.</p> <p>A small portion of the subject land contains land mapped on the Biodiversity Values map (accessed August 2025). This patch of vegetation was validated during 2022 field survey and includes a patch of PCT 3320 (mown) in a disturbed condition and exotic canopy species (<i>Populus deltoides</i>). PCT 3320 is listed as a TEC under the BC Act and EPBC Act and represents high biodiversity values. Of the 0.34 ha of PCT 3320 mapped within the subject land, only 0.02 ha or 6% will be</p>

Approach	How addressed and justification
	<p>affected. The areas of PCT 3320 of high conservation value including areas which satisfy listing under the EPBC Act will be entirely retained within the VMP area.</p> <p>Additionally, the proposed project has avoided impacts to five hollow-bearing trees located with PCT 3320 and exotic vegetation. The project redesign has retained two additional hollow-bearing trees within the patch of exotic vegetation. The loss of one hollow bearing tree will be compensated with the installation of nest boxes in the vegetation management area at a ratio of 1:1.</p> <p>The impacts to PCT 3320 have been minimised through proposing the retention of the majority of the patch of PCT 3320 with the subject land and proposing to impact upon a single isolated tree which represents PCT 3320 in poor condition which lacks any hollows.</p> <p>Although the project has utilised predominately exotic vegetation with low biodiversity values, it will impact upon a small amount of native vegetation listed as a TEC under the BC Act and therefore, contains high biodiversity values. It is noted that these impacts represent scattered trees which do not form part of the EPBC listed patch in the north. Effort to avoid or minimise impacts have been demonstrated through the retention of areas of high biodiversity values and use of land with low or negligible biodiversity values. A VMP will be prepared for the long-term conservation of the patch of PCT 3320 retained within the subject land (ELA 2025a).</p>
<p>Locating the project in areas where the native vegetation or threatened species habitat is in the poorest condition</p>	<p>The project is located in areas where native vegetation is in poor condition with a low vegetation integrity score. The project will remove poorer quality PCT 3320 including an isolated <i>Eucalyptus tereticornis</i> which is in low condition and lacks native species diversity and does not represent EPBC Act listed vegetation.</p> <p>Although the majority of the vegetation within the development footprint contains exotic grasses, the project design will impact upon 0.02 ha of PCT 3320 which listed as a TEC under the BC Act. The redesign has ensured that the project does not impact upon PCT 3320 which is listed under the EPBC Act.</p>
<p>Locating the project in areas that avoid habitat for species with a high biodiversity risk weighting or land mapped on the important habitat map, or native vegetation that is a TEC, a highly cleared PCT or an entity at risk of a serious and irreversible impact (SAII)</p>	<p>The project is predominantly located in exotic grass to avoid impacts to vegetation in high threat categories. The project will impact upon PCT 3320 which has a biodiversity risk weighting of 2.5 according to the BAMC. PCT 3320 is listed as a part of Cumberland Plains Woodland TEC and is a SAII entity. Impacts to PCT 3320 have been avoided by retaining 0.32 ha of PCT 3320 which will be conserved with the subject land.</p>
<p>Locating the project in areas outside of the buffer area around breeding habitat features such as nest trees or caves</p>	<p>The proposal does not contain evidence of nest tree/ caves/breeding habitat for species credit species within the subject land.</p> <p>One small stick nest was located within the subject land was identified as an Australian Raven nest will be retained and impacts are more than 30 m from the nest.</p>

6.1.1 Designing a project to avoid and minimise on biodiversity values

The development has been designed in a way which avoids and minimises impacts as outlined in Table 24.

Table 24: Designing a project to avoid and minimise direct and indirect impacts on vegetation and habitat

Approach	How addressed and justification
Reducing the clearing footprint of the project by minimising the number and type of facilities	The project has been designed to minimise impacts to from 0.09 ha to 0.02 ha of PCT 3320 in the northern portion of the proposed subject land. The redesign has removed one of the buildings from the final design. A total of 0.02 ha of PCT 3320 will be impacted under the proposed works. Effort has been made in the design process to retain the patch of PCT 3320 where possible. One scattered tree which form part of this vegetation community will be impacted by the development. The new design has retained two additional trees which are mapped as part of PCT 33320 along the southern boundary and in the centre portion of the subject land. The large path of PCT 3320 will be protected from direct impacts and will be restored through revegetation works in accordance with the VMP prepared by ELA (2025a).
Locating ancillary facilities in areas that have no biodiversity values	Ancillary facilities will be located where there are no biodiversity values such as exotic grasslands or existing carpark area. Ancillary facilities for the purposes of construction (e.g. compound, machinery storage) will be located within the development footprint in previously cleared areas. No additional native vegetation will be removed as a result of the ancillary facilities.
Locating ancillary facilities in areas where the native vegetation or threatened species habitat is in the poorest condition (i.e. areas that have a lower vegetation integrity score)	The development footprint overlaps with 0.02 ha of PCT 3320. The vegetation integrity score for this vegetation zones was 57.1. Impacts to PCT 3320 is limited to the removal of one scattered <i>Eucalyptus tereticornis</i> . The proposal will retain the canopy species which represents PCT 3320 along the southern boundary and in a large patch in the north which also contains hollow bearing trees. These hollows and the canopy tree species serve as roosting or foraging habitat for fauna species. Ancillary facilities will not be located in native vegetation areas outside the development footprint. Ancillary features for the purposes of the project will be located within the operational footprint, avoiding additional impacts to areas of native vegetation, or threatened species habitat.
Locating ancillary facilities in areas that avoid habitat for species and vegetation that has a high threat status (e.g. an endangered ecological community (EEC) or critically endangered ecological community (CEEC) or is an entity at risk of a serious and irreversible impact (SAIL))	Ancillary facilities will not be located in native vegetation areas outside of the development footprint. The proposed development originally required the removal of two additional trees which represent part of PCT 3320 within the subject land. However, the plans have been amended to retain a total of 0.32 ha of PCT 3320 within the subject land. The proposed development will impact 0.02 ha of PCT 3320, which conforms to the TEC <i>Cumberland Plain Woodland in the Sydney Basin Bioregion</i> . This TEC is listed as a CEEC under the BC Act and is an SAIL entity. This vegetation patch contains several canopy species with a mown ground layer and absence of midstorey or regenerating canopy species. The vegetation does not provide habitat for threatened flora or fauna species.
Actions and activities that provide for rehabilitation, ecological restoration and/or ongoing maintenance of retained areas of native vegetation, threatened species, threatened ecological communities and their habitat on the subject land.	The proposal will retain 0.32 ha of PCT 3320 for conserved including habitat for threatened species and TEC and mapped on the Biodiversity Values Map. The proposed area for conservation will be managed in accordance with a Vegetation Management Plan and include revegetation works characteristic of PCT 3320.

6.1.2 Locating a project to avoid and minimise prescribed biodiversity impacts

Habitat connectivity and waterbodies were identified as prescribed impacts in Section 5.4. The development has been located to avoid and minimise prescribed biodiversity impacts in Table 25.

Table 25: Locating a project to avoid and minimise prescribed biodiversity impacts

Approach	How addressed and justification
<p>Locating the surface works to avoid direct impacts on the habitat features</p>	<p>The proposal will result in the removal of one hollow-bearing tree located in an exotic tree. The remaining five hollow-bearing trees will be retained within the subject land. The redesign of the proposal has resulted in the protection of two additional hollow-bearing tree which were previously identified for removal.</p> <p>The surface works will not further impact upon connectivity or other habitat features.</p>
<p>Locating the envelope of sub-surface works, both in the horizontal and vertical plane, to avoid and minimise operations beneath the habitat features, e.g. locating long wall panels away from geological features of significance or water dependent plant communities and their supporting aquifers</p>	<p>The project will result in changes to the current topography using cut and fill to create flat terrain prior to development (Figure 6).</p> <p>Changes to hydrological flows into the TEC are likely to occur due to changes in topography within the development footprint. Changes to hydrological flow will be mitigated through the design of stormwater basins and revegetation works. The VMP will assist in the long-term conservation of the TEC in the north through revegetation, weed removal and on-going monitoring works.</p> <p>The proposed retail building and infrastructure in the south-western portion of the development footprint is unlikely to result in changes to the hydrological flow of Werrington Creek. However, there is potential for some changes to the hydrological flow into the patch of PCT 4025 adjacent to the development footprint. This patch of vegetation mapped as PCT 4025 represents part of the River-flat Eucalypt Forest which is a water dependent plant community. Impacts to the change in hydrological flows and sedimentation will be mitigated during construction through effective controls.</p>
<p>Locating the project to avoid severing or interfering with corridors connecting different areas of habitat, migratory flight paths to important habitat or preferred local movement pathways</p>	<p>The vegetation in the north of the subject land is part of a larger patch of PCT 3320 which is located in the adjacent property to the north. This patch of native vegetation is isolated from other native vegetation. The exotic grasses and major arterial roads interfere with corridors for majority of threatened species except highly mobile species (i.e. birds and bats). There is a patch of PCT 4025 along the western boundary of the subject land which is fragmented by O’Connell Street and a tall security fence along the boundary of Western Sydney University Kingswood campus.</p> <p>The project will result In changes to the landscape from exotic grassland to residential and commercial development. The project may result in some fauna species avoiding the native vegetation due to changes in the land use. This may will result in an increase distance between stepping-stone habitat for highly mobile species. However, the vegetation within the subject land is not part of an important flight path to important habitat or preferred local movement pathway or a connectivity between habitats within the landscape. The project may result in greater distance between stepping-stone habitat; however, it will not result in further isolation of habitat for these species. Landscaping plans have included street tree plantings along the internal roads to assist in retaining connectivity for arboreal species. A FMP has been prepared for the SSD application to mitigate impacts to fauna species including the resident population of eastern grey kangaroos (ELA 2025b).</p>
<p>Locating the project to avoid direct impacts on water bodies</p>	<p>The project will directly impact upon the headwaters to one mapped 1st order stream located within the development footprint. However, it is noted that this stream does not function as a creek and has a partially concrete base and flows</p>

Approach	How addressed and justification
	into a culvert in the north. The project has avoided impacts to Werrington Creek along the western boundary.

6.2 Designing a project to avoid and minimise impacts to prescribed biodiversity impacts

The development has been designed in a way which avoids and minimises prescribed biodiversity impacts as outlined in Table 26.

Table 26: Designing a project to avoid and minimise prescribed biodiversity impacts

Approach	How addressed and justification
Design of project elements to minimise interactions with threatened entities	<p>The proposed development footprint has undergone iterations in an attempt to avoid impacts to threatened entities. An ecological constraints assessment was conducted in 2023 during early consultation to identify ways to minimise impacts to the TEC present within the subject land. The DA submission in 2023 was assessed by council and a subsequent redesign was prepared for this current SSDA submission. The SSDA has reduced impacts to threatened entities (i.e. TEC and swift parrot habitat).</p> <p>The project will result in removal of 0.002 ha of PCT 3320 mapped as swift parrot habitat and 0.02 ha of TECs (BC Act listed only). The design of the project avoided impacts to 0.32 ha of PCT 3320 and has retained the entire patch of EPBC listed PCT 3320. The redesign has reduced the direct impacts on a TEC and threatened species habitat by retaining vegetation within the subject land. No other threatened entity was recorded which may be impacted by the design.</p>
Maintain environmental processes that are critical to the formation and persistence of habitat features not associated with native vegetation	<p>The project is located in a highly modified landscape and impacts upon one hollow-bearing trees and waterbody which is critical to habitat features.</p> <p>The project will impact upon one mapped 1st Strahler order stream located within the development footprint. The project will also result in cut and fill across the development footprint which may alter the natural surface water flow across the subject land and downstream. The creation of hard surfaces will further alter the natural hydrological flows through the subject land. This may result in changes to the habitat features (i.e. water bodies) which flow into the adjacent 2nd order stream (Werrington Creek) along the western boundary of the subject land. Impacts to the hydrological flow have been managed through landscaping to re-instate the natural flow through stormwater structures and revegetation within the development footprint. No impact to Werrington Creek will occur.</p>
Maintain hydrological processes that sustain threatened entities	<p>No hydrological process that sustain threatened entities were recorded within the subject land. However, the design will result in impacts to one mapped 1st order stream located within the development footprint. This stream currently consists of a grassy swale and concrete open drain. The surface water flow currently drains into the concrete drain and at times flow into PCT 3320 in the north. PCT 3320 is not listed as a threatened entity which relies upon hydrological flow. The proposed design will reduce flooding into PCT 3320 which may act as a positive outcome for the TEC and better health to the TEC. The VMP</p>

Approach	How addressed and justification
	<p>will ensure that the health of the TEC (PCT 3320) is monitored and retained in good health.</p> <p>Surface works will occur adjacent to Werrington Creek in the western portion of the subject land. The works may result in changes to the current hydrological flow and water quality into the TEC (PCT 4025). These indirect impacts will be mitigated through the implementation of effective sediment and erosional controls.</p>
<p>Controlling the quality of water released from the site, to avoid or minimise downstream impacts on threatened entities</p>	<p>Changes to hydrological flow will occur as part of the design. The works involves impacts to threatened entities such as TECs PCT 3320 and PCT 4025. The proposed project includes revegetation works with the VMP area to the north (ELA 2025a) to protect impacts on threatened entities.</p>

7. Assessment of Impacts

7.1 Direct impacts

The direct impacts of the development on:

- native vegetation is outlined in Table 27
- threatened ecological communities are outlined in Table 28
- threatened species and threatened species habitat is displayed in Table 29
- prescribed biodiversity impacts are outlined in Section 7.2.2.

Direct impacts including the final project footprint (construction and operation) are shown on Figure 6.

Table 27: Direct impacts to native vegetation

Vegetation zone	PCT ID	PCT Name	Condition	Direct impact (ha)
1	3320	Cumberland Shale Plains Woodland	Mown	0.02

Table 28: Direct impacts on threatened ecological communities

PCT ID	BC Act			EPBC Act		
	Listing status	Name	Direct impact (ha)	Listing status	Name	Direct impact (ha)
3320	CEEC	Cumberland Plain Woodland in the Sydney Basin Bioregion	0.02	CEEC	Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Nil*

THIS PATCH OF PCT 3320 DID NOT REPRESENT PART OF THE EPBC LISTED PATCH

Table 29: Direct impacts on threatened species and threatened species habitat

Species	Common name	Direct impact / number of individuals / habitat (ha)	BC Act listing status	EPBC Act listing status
<i>Lathamus discolor</i>	swift parrot	0.002* ha	Endangered	Critically endangered

* NOTE – THE MINIMUM NUMBER OF HECTARES ENTERED INTO THE CREDIT CALCULATOR IS 0.01 HA.

7.2 Change in vegetation integrity

The change in vegetation integrity as a result of the development is outlined in Table 30.

Table 30: Change in vegetation integrity

Vegetation Zone	PCT ID	Condition	Area (ha)	Current vegetation integrity score	Future vegetation integrity score	Change in vegetation integrity
1	3320	Direct	0.02	57.1	0	-57.1

7.2.1 Indirect impacts

The indirect impacts of the development are outlined in Table 31.

Table 31: Indirect impacts

Indirect impact	Description (nature, extent and frequency)	Biodiversity value affected	Duration/Timing	Consequence
Inadvertent impacts on adjacent vegetation or habitat	Damage to vegetation outside the approved construction/development footprint during construction and operational phases.	Native vegetation, threatened ecological community	Short term impacts Construction and operational phase	Loss of vegetation, loss of potential foraging habitat for threatened species
Reduced viability of adjacent habitat due to edge effects	Removal of vegetation on the edge of the development footprint may cause edge effects. Reduced viability of specialist and/or threatened species. Most likely to occur during the construction phase.	Native vegetation, threatened ecological community and native fauna	Short term impacts Construction phase.	Increase in edge effects, weed species colonising areas of disturbed habitat on edge of the subject land, causing reduction in habitat for some flora and fauna species
Reduced viability of adjacent habitat due to noise, dust or light spill	Noise and dust created from machinery during daytime construction. Night work is not expected as part of the construction works therefore, no light spill associated with night works. However, it is expected that outdoor night lighting will be used as part of the operational phase.	Native fauna, native vegetation	Short term impacts (construction phase) Ongoing impacts (life of project)	Noise and dust deter native fauna from the subject land in the short term. Dust may inhibit plant growth in the short term. Night lighting may influence fauna behaviour in the long-term, e.g. attraction of invertebrates to lighting, therefore species such as microbats may be increasingly attracted to the area. Night lighting may also disrupt fauna movement and activity, including foraging.
Transport of weeds and pathogens from the site to adjacent vegetation	Weeds and pathogens introduced into subject land and adjacent retained vegetation, resulting from transport of topsoil or machinery.	Native vegetation, threatened ecological community	Construction phase. May cause long-term impacts.	Potential for weed spread into adjacent habitat and affect quality of vegetation for native flora and fauna. Potential for pathogens to be introduced into the subject land through use of machinery.

Indirect impact	Description (nature, extent and frequency)	Biodiversity affected	value	Duration/Timing	Consequence
Increased risk of starvation or exposure and loss of shade or shelter	Permanent loss of shade/shelter due to loss of canopy. Permanent loss of suitable foraging habitat for Grey-headed Flying-fox	Native fauna		Short and long term impacts, during life of project	Permanent loss of shade or shelter for some fauna species such as reptiles, however, contiguous adjacent habitat will continue to provide shelter, so risk of starvation and exposure is low and short term.
Trampling of threatened flora species	Threatened flora species are unlikely to occur in the subject land due to the high exotic groundcover and low condition of native vegetation.	N/A		N/A	N/A
Inhibition of nitrogen fixation and increased soil salinity	The project is unlikely to inhibit nitrogen fixation or increase soil salinity outside the development footprint.	N/A		N/A	N/A
Fertiliser drift	Fertilisers may be used post-construction for landscaping purposes, however as this would be applied to specific areas and not applied aerially, this potential impact is unlikely to occur.	Native vegetation, threatened ecological community		Ongoing impacts Post-construction	Decreased plant diversity and increased exotic cover, as invasive species take advantage of additional nutrients.
Rubbish dumping	Within and adjacent to the subject land during construction and operational phases.	Native vegetation, threatened ecological community		Short-term and long-term impacts	Rubbish dumping may impact on quality and health of fauna or flora species and habitat retained adjacent to the development footprint. Dumped rubbish may have downwind effects where it is loose and makes its way into sensitive ecosystems or suffocates fauna.
Wood collection	Removal of wood from subject land	Native vegetation, threatened ecological community		Short-term and long-term impacts	Permanent removal of microhabitats could impact native

Indirect impact	Description (nature, extent and frequency)	Biodiversity affected	value	Duration/Timing	Consequence
				Life of project, including construction phase	fauna populations in land surrounding the subject land.
Removal and disturbance of rocks including bush rock	Potential for disturbance during construction phase and for residents to collect bush rock during operational phase of future residential development.	Native fauna and native vegetation habitat		Construction phase Operational phase	Potential reduction in fauna habitat and decline in rock habitat available.
Increase in predators	Increased predation on native fauna, reduction in vegetation where predators graze on habitat. Resulting from urban development and opportunistic increase in predators.	Native fauna		Long term impacts	Decreased native fauna diversity and population sizes.
Increase in pest animal populations	Resulting from urban development and opportunistic increase in pest/invasive species that thrive in urban spaces. Increased native fauna competition in surrounding habitat. Likely limited effects considering limited existing habitat in surrounds and extensive urban development north of the subject land. Increased grazing or degradation of retained native vegetation by rabbits. Trampling of vegetation.	Native vegetation, native fauna		Long term impacts	Decreased native fauna diversity and population sizes. Loss of habitat due to grazing, degradation or trampling.
Changed fire regimes	During construction, working machinery and/or chemicals have the potential to spark fire. Potential fire hazard associated with industrial activities post-construction.	Native vegetation, native fauna		Life of project including construction. Short-term and long-term impacts.	Disturbance to vegetation, loss or damage to old growth trees retained within the subject land. Loss of habitat for fauna species. Death of fauna species.
Disturbance to specialist breeding and foraging habitat, e.g. beach nesting for shorebirds	Disturbance/removal of foraging habitat for Eucalypt-dependent and highly mobile species (such as Grey-headed Flying-fox).	Native fauna		Short-term and long-term impacts. Life of project.	Reduced numbers of species in vicinity. Deter or alter breeding and foraging regimes for fauna in proximity to development.

Indirect impact	Description (nature, extent and frequency)	Biodiversity affected	value	Duration/Timing	Consequence
	Ongoing light and/or noise impacts to native fauna associated with the operational phase.				
Sedimentation and contaminated and/or nutrient rich run-off	Runoff containing high nutrients and/or contamination into adjacent vegetation during construction and operational phases.	Native threatened ecological community	vegetation, ecological	Short-term and long-term impacts. Life of project. Construction phase higher risk (due to machinery/refuelling)	Change in vegetation quality. Habitat loss downwind or downslope of subject land.
Vehicle strike	Potential for native fauna to be struck by working machinery and moving vehicles during construction and operational phases	Native fauna		Short-term (construction) Long-term (operational)	Loss of native fauna species. Potential reduction in fauna population numbers.

7.2.2 Prescribed biodiversity impacts

The subject land has the prescribed biodiversity impacts as outlined in Table 32.

Table 32: Direct impacts on prescribed biodiversity impacts

Prescribed biodiversity impact	Description (Nature, extent and frequency)	Consequences	Justification
Karst, caves, crevices, cliffs, rocks and other geological features of significance	There are no karsts, caves, crevices, cliffs, rocks or other geological features in the subject land	N/A	N/A
Human made structures or non-native vegetation	<p>There are limited human made structures in the subject land such as concrete carpark and internal roads. These features do not provide habitat for fauna species.</p> <p>There are some patches of non-native vegetation in the subject land including <i>Populus deltoides</i> and weeds <i>Olea europaea</i> subsp. <i>cuspidata</i>. There is no scientific literature which indicates that the grey-headed flying-fox utilises these exotic species as foraging habitat. As a precaution, the exotic vegetation is considered very marginal supplementary foraging habitat and would most likely be used in the absence or in conjunction with native foraging resources.</p>	Loss of supplementary / marginal foraging habitat for some highly mobile species	Impacts to marginal, exotic foraging habitat have been justified as it has allowed the retention of native vegetation which also forms Cumberland Plain Woodland.
Habitat connectivity	The vegetation patch in the north will be retained and will maintain the current habitat connectivity. Some loss of native and exotic vegetation within the remainder of the subject land and changes in landscape use by result in avoidance of habitat by some native species.	The potential disruptions to habitat connectivity are limited, given that the vegetation to be removed is bordered by cleared land and rural housing.	Connectivity of native vegetation along the northern portion of the subject land was prioritised to retain connectivity with the broader landscape.
Water bodies, water quality and hydrological processes	The subject land contains one 1 st order stream which does not function as a water body as the stream is partly concrete and does not contain	The mapped watercourse does not meet the definition of a watercourse under the WM Act.	The vegetation corridor would be managed under a VMP (ELA 2025).

Prescribed biodiversity impact	Description (Nature, extent and frequency)	Consequences	Justification
	a defined bed and bank, pooling of water or semi-aquatic vegetation. There are no water bodies in the subject land.	Hydrological flows will be maintained through the use of gabion walls and revegetation of native sedges consistent with PCT 3320.	
Wind turbine strikes on protected animals	N/A	N/A	N/A
Vehicle strikes	The patch of native vegetation to be retained in the subject land is bordered by perimeter roads.	There is a very low potential for vehicle strike.	The patch of vegetation to be retained, historically, has been poorly connected to other areas of habitat small in extent. It is unlikely that this vegetation provided habitat for a range of fauna likely to be susceptible to vehicle strike. A Fauna Management Plan (FMP) has been prepared for the DA (ELA 2025b).

7.2.3 Mitigating and managing impacts

Measures proposed to mitigate and manage impacts at the subject land before, during and after construction are outlined in Table 33.

Table 33: Measures proposed to mitigate and manage impacts

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Sediment barriers or sedimentation ponds to control the quality of water released from the site into the receiving environment	Moderate	Minor	Appropriate controls are to be utilised to manage exposed soil surfaces and stockpiles to prevent sediment discharge into retained lands. Soil and erosion measures such as sediment fencing, clean water diversion must be in place prior the commencement of the construction work.	Erosion and sedimentation will be controlled	For the duration of construction works	Project Manager
Prevent impacts of noise, dust and light spill on fauna species	Moderate	Minor	Construction lights or development lights should be positioned to prevent shine into retained vegetation. Street lights should use ecologically sensitive designs including use of shields and timers and positioned away from retained vegetation. Noise should be limited to construction hours only. Dust should be managed through appropriate dust control management plan.	Avoid impacts from artificial lighting on nocturnal or diurnal species. Reduction of noise outside of operation hours. Management of dust.	For the duration of the construction works and long-term	Project Manager
Prevent damage to vegetation retained on site	High	Moderate	Clearly delineate clearance limits and identify all trees for removal. Install 'No-go' fencing around vegetation to be retained prior to any works on site.	Prevent accidental removal of native vegetation Prevent damage to retained revegetation	For the duration of construction works	Project Manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Instigating clearing protocols including pre-clearing surveys, daily surveys and staged clearing, the presence of a trained ecological or licensed wildlife handler during clearing events	Moderate	Minor	Removal of vegetation and other works on site must be consistent with the Fauna Management Plan (ELA 2025b). These may include, but not limited to, the following: Pre-clearance survey of trees to be removed and identification / location of habitat trees (i.e. for birds or possums) by a suitably qualified ecologist. Trees identified for retention should be clearly delineated as a 'No Go' zone with high visibility bunting. Supervision by a qualified ecologist/licensed wildlife handler during habitat tree removal in accordance with best practise methods. Any tree removal is to be undertaken by a suitably qualified and insured arborist.	Any fauna utilising habitat within the subject land will be identified and managed to ensure clearing works minimise the likelihood of injuring resident fauna	During clearing works	Project Manager / Ecologist
Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Moderate	Minor	Vehicles, machinery should be cleaned of soil prior to entry into the subject land as external soil may contain pathogens or disease. Weed management to be undertaken as part of the VMP.	Spread of weeds prevented	Post-construction	Project Manager
Prevent the displacement of resident fauna	Moderate	Minor	Pre-clearance survey of trees to be removed and identification/location of habitat trees by a suitably qualified ecologist. Supervision by a qualified ecologist/licensed wildlife handler during tree removal in accordance with best practice methods. Kangaroo exclusion fencing is to be installed prior to works on site.	Resident fauna relocated in a sensitive manner	Prior to and during clearing works	Project Manager/ Ecologist
Timing works to avoid critical life cycle events such as breeding or nursing individuals	Moderate	Minor	Where possible within construction timelines, avoid clearing works in later winter/spring during breeding/ nesting season for animals.	Impacts to fauna during nesting/nursing season avoided	During clearing works	Project Manager

Measure	Risk before mitigation	Risk after mitigation	Action	Outcome	Timing	Responsibility
Making provision for the ecological restoration, rehabilitation and/or ongoing maintenance of retained native vegetation habitat on or adjacent to the subject land	Minor	Negligible	Landscaping in the subject land is to use locally derived native species and those found within the PCT present (PCT 3320). Vegetation will be retained and managed as part of the VMP.	Areas within the subject land will be landscaped using appropriate species	Throughout construction and following completion of construction activities.	Project Manager
Prevent the dumping of rubbish found on site	Minor	Negligible	Waste bins to be present on site. Covers to be used to prevent blown litter and the entry of pest animals or rain. Removal and appropriate disposal of general.	Dumping of rubbish during construction prevented	For the duration of the construction works	Project Manager
Staff training and site briefing to communicate environmental features to be protected and measures to be implemented	Minor	Negligible	Construction staff to be briefed prior to work commencing to be made aware of any sensitive biodiversity values present and environmental procedures such as: <ul style="list-style-type: none"> Site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and weeds) What to do in case of environmental emergency (chemical spills, fire, injured fauna) Key contacts in case of environmental emergency. 	All staff entering the subject land are fully aware of all the ecological values present within the Lot and environmental aspects relating to the development and know what to do in case of any environmental emergencies.	To occur for all staff entering/working at the subject land. Site briefings should be updated based on phase of the work and when environmental issues become apparent.	Project Manager

7.2.4 Adaptive management strategy

Adaptive management for uncertain biodiversity impacts (that are infrequent or difficult to measure) is not relevant or required for the proposed development.

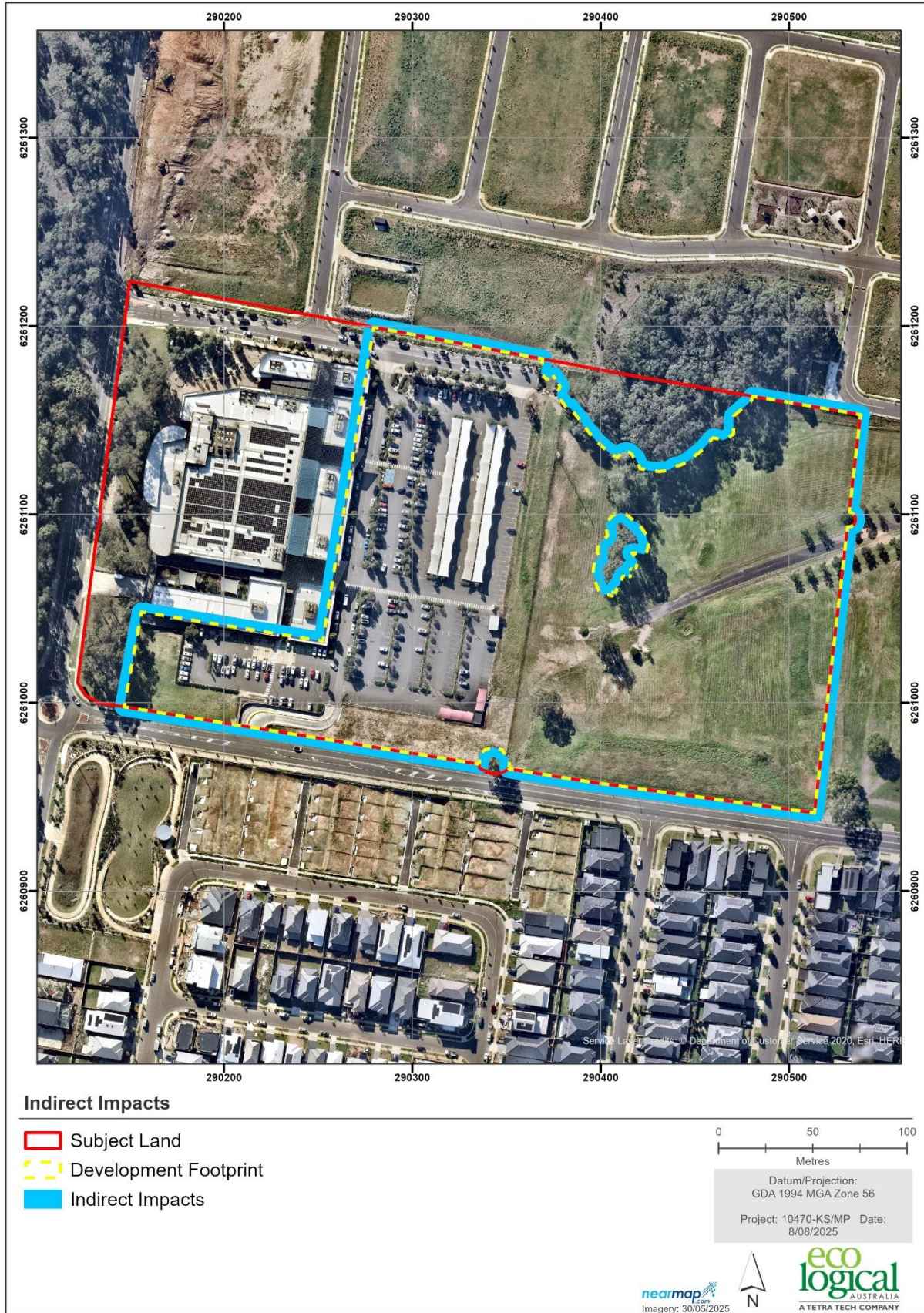


Figure 22: Indirect impact zones

8. Impact summary

Following implementation of the BAM and the BAMC, the following impacts have been determined.

8.1.1 Serious and Irreversible Impacts (SAIL)

The development has two candidate Serious and Irreversible Impact (SAIL) values as outlined in Table 34, and shown on Figure 23. Detailed consideration of whether impacts on candidate TECs are serious and irreversible is included in Table 36- Table 38.

Table 34: Serious and Irreversible Impacts Summary

Species / Community	Common Name	Principle	Direct impact area (ha)
Cumberland Plain Woodland	N/A	1 and 2	0.02
<i>Lathamus discolor</i>	Swift parrot	1	0.002

Table 35: Determining which Principles apply to serious and irreversible candidate entities (Clause 6.7 of the BC Regulation) – Cumberland Plain Woodland

Determining whether impacts are serious and irreversible	Assessment
Principle 1	
Does the proposal impact on a species, population or ecological community that is a candidate entity because it is in a rapid rate of decline?	Yes, the TBDC has identified that this TEC is a SAIL entity due to Principle 1— the reduction of the population by >80% in the last 10 years or three generations.
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	There are no thresholds identified for this ecological community. The proposed development will result in 0.02 ha of impact to areas mapped as PCT 3320.
Principle 2	
Does the proposal impact on a species that is a candidate entity because it has been identified as having a very small population size?	Yes, the TBDC has identified that this TEC has < 50 individuals or <250 individuals where threats are known.
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	There are no thresholds identified for this ecological community. The proposed development will result in 0.02 ha of impact to areas mapped as PCT 3320.
Principle 3	
Does the proposal impact on the habitat of a species or an area of an ecological community that is a candidate entity because it has a very limited geographic distribution?	N/A
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	
Principle 4	
Does the proposal impact on a species, a component of species habitat or an ecological community that is a candidate entity because it is irreplaceable?	N/A

Determining whether impacts are serious and irreversible	Assessment
b. If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	

Table 36: Evaluation of an impact on a TEC – Cumberland Plain Woodland

Impact Assessment Provisions 10.2.2.1	Assessment
<p>1. the action and measures taken to avoid the direct and indirect impact on the potential entity for an SAI</p>	<p>The development footprint has been situated within a section of the site containing predominantly low biodiversity values, based on the ecological constraints assessment. The majority of impacts will occur in areas of exotic grassland and of the 0.02 ha Cumberland Plain Woodland (PCT 3320) occurs in a degraded form (i.e. scattered <i>Eucalyptus tereticornis</i> in exotic grasses).</p> <p>Approximately 0.32 ha of Cumberland Plain Woodland will be retained within the subject land. The redesign has ensured that the entire patch of PCT 3320 which is part of the EPBC listed vegetation patch, will be retained. ELA has prepared a Vegetation Management Plan (VMP) for revegetation works and on-going weed management within this vegetation.</p> <p>Indirect impacts in the retained Cumberland Plain Woodland will be minimised through the implementation of a VMP and mitigation measures provided in Section 8.4.3 of this report.</p>
<p>2a. evidence of reduction in geographic distribution (Principle 1, clause 6.7(2)(a) BC Regulation) as the current total geographic extent of the TEC in NSW AND the estimated reduction in geographic extent of the TEC since 1970 (not including impacts to the proposal)</p>	<p>Cumberland Plain Woodland has undergone a substantial reduction in the geographic distribution. The most recent information about the reduction of this TEC in NSW is contained in the Final Determination for Cumberland Plain Woodland, which includes the following:</p> <ul style="list-style-type: none"> • The total extent of Cumberland Plain Woodland was estimated to be ~8.8% of the community’s pre-European distribution by Tozer in 2003 based on aerial photography from 1998. • This estimate was updated in 2007, showing a decline of ~5.2% in 9 years. • There are currently no estimates of the decline in the TEC since 1970.
<p>2b. extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes (Principle 2, clause 6.7(2)(b) BC Regulation) indicated by:</p> <ul style="list-style-type: none"> - change in community structure - change in species composition - iii. disruption of ecological processes - iv. invasion and establishment of exotic species - degradation of habitat, and vi. fragmentation of habitat 	<p>The extent of reduction in ecological function for the TEC is also found in the Final Determination, as follows:</p> <ul style="list-style-type: none"> • The community structure has changed such that almost all of the remaining Cumberland Plain Woodland is considered to be regrowth forest and woodland from past clearing activities. • Species composition has changed such that remnants are largely degraded by weed invasion and regrowth stands with high densities of saplings or shrubs may suppress ground flora. • Ecological processes have been disrupted by the chemical and structural modification associated with agricultural land uses and more recent expansion of urban land uses which the Cumberland Plain has historically been subjected to.

Impact Assessment Provisions 10.2.2.1	Assessment
<p>2c. evidence of restricted geographic distribution (Principle 3, clause 6.7 (2)I) BC Regulation), based on the TECs geographic range in NSW according to the: i. extent of occurrence ii. area of occupancy, and iii. number of threat-defined locations.</p>	<ul style="list-style-type: none"> The TEC has been identified as being severely fragmented. <p>Cumberland Plain woodland is highly restricted to the Sydney Basin Bioregion. According to the Final Determination, it was estimated to occur within an extent of 2,810 km² and is known from the Auburn, Bankstown, Baulkham Hills, Blacktown, Camden, Campbelltown, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta, Penrith and Wollondilly LGAs. These locations are all subject to threats to the TEC, including weed invasion and clearing of native vegetation.</p>
<p>2d. evidence that the TEC is unlikely to respond to management (Principle 4, clause 6.7 (2) (d) BC Regulation).</p>	<p>The Final Determination states that areas where management aims to conserve the TEC suggests that it is capable of some recovery, provided the soil has not been disturbed by earthworks, cultivation, fertiliser application or other means of nutrient or moisture enrichment. The Final Determination also states that opportunities for restoration of the TEC is limited, given that the majority of the former distribution of the community has been subjected to some soil disturbance.</p>
<p>3. Where the TBDC indicated that data is 'unknown' or 'data deficient' for a TEC for a criterion listed in subsection 9.1.1(2), the assessor must record this in the BDAR or BCAR.</p>	<p>N/A – all data is provided in the Final Determination as summarised above.</p>
<p>4a. the impact on the geographic extent of the TEC (Principles 1 and 3) by estimating the total area of the TEC to be impacted by the proposal: i. in hectares, and ii. as a percentage of the current geographic extent of the TEC in NSW.</p>	<p>The total area of the TEC to be affected by the proposal is 0.02 ha. Existing vegetation mapping estimates 22,920 ha of Cumberland Plain Woodland (identified as PCT 3320 or 850 by previous mapping) is present in NSW. Therefore, the area of TEC to be affected represents an estimate of <0.0001% of the current geographic extent of the TEC. It should be noted that the GIS analysis used existing vegetation mapping datasets and did not include ground truthing the extent of the mapped Cumberland Plain Woodland.</p>
<p>4b. the extent that the proposed impacts are likely to contribute to further environmental degradation or the disruption of biotic processes (Principle 2) of the TEC by:</p> <ul style="list-style-type: none"> i. estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500 m of the development footprint or equivalent area for other types of proposals ii. describing the impacts on connectivity and fragmentation of the remaining areas of TEC measured by: <ul style="list-style-type: none"> - distance between isolated areas of the TEC, presented as the average distance if the remnant is retained AND the average distance if the remnant is removed as proposed, and 	<p>The vegetation within the subject land is contiguous with the vegetation patch in the adjoining land to the north. This patch is approximately 1 ha in total. The second nearest patch is located directly west of the subject land approximately 200 m away from the patch of PCT 3320 in the subject land. These areas are fragmented by the existing shopping centre, hardstands and road infrastructure. Birds and bats may traverse this fragmentation. From a review of aerial photography, the remaining patches within 500 m of the development footprint appear to be small clusters of vegetation scattered within the landscape. The proposed removal of a small amount of PCT 3320 within the development would not result in further fragmentation of vegetation as the majority of the patch 0.29 ha of PCT 3320 recorded within the subject land will be retained. Given the fragmentation throughout the locality, it is likely that seed is dispersed mostly by mobile fauna such as birds and bats. The estimated maximum dispersal distance for grey-headed flying-fox would be their average nightly foraging range of 20 km.</p> <p>The condition of the community throughout the development footprint was generally moderate due to the high level of species diversity within the groundlayer. Regular mowing has prevented recruitment of regenerating canopy or shrub layer. The patch of the</p>

Impact Assessment Provisions 10.2.2.1	Assessment
<ul style="list-style-type: none"> - estimated maximum dispersal distance for native flora species characteristic of the TEC, and - other information relevant to describing the impact on connectivity and fragmentation, such as the area to perimeter ratio for remaining areas of the TEC as a result of development <p>describing the condition of the TEC according to the vegetation integrity score for the relevant vegetation zone(s) (Section 4.3). The assessor must also include the relevant composition, structure and function condition scores for each vegetation zone.</p>	<p>community was sampled in the area considered to be in best condition and achieved a VI Score of 57.1.</p>

Table 37: Determining which Principles apply to serious and irreversible candidate entities (Clause 6.7 of the BC Regulation) – Swift parrot

Determining whether impacts are serious and irreversible	Assessment
Principle 1	
Does the proposal impact on a species, population or ecological community that is a candidate entity because it is in a rapid rate of decline?	Yes, the TBDC has identified that this species is a SAll entity due to Principle– 1 - the reduction of the population by >80% in the last 10 years or three generations.
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	There are no thresholds identified for this species. The proposed design will result in 0.002 ha of impact to areas mapped as Important Habitat.
Principle 2	
Does the proposal impact on a species that is a candidate entity because it has been identified as having a very small population size?	N/A
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	
Principle 3	
Does the proposal impact on the habitat of a species or an area of an ecological community that is a candidate entity because it has a very limited geographic distribution?	N/A
If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	
Principle 4	
Does the proposal impact on a species, a component of species habitat or an ecological community that is a candidate entity because it is irreplaceable?	N/A

Determining whether impacts are serious and irreversible	Assessment
b. If yes, is the impact in excess of any threshold identified and therefore likely to be serious and irreversible?	

Table 38: Evaluation of impacts on candidate species consistent with Section 9.1.2 of the BAM – Swift parrot

Impact Assessment Provision	Assessment
1. the action and measures taken to avoid the direct and indirect impact on the species at risk of an SAIL. Where these have been addressed elsewhere the assessor can refer to the relevant sections of the BDAR or BCAR.	The majority of the area mapped as Important Habitat for swift parrot will be protected within the land proposed for conservation. A small area (0.002 ha of PCT 3320) which has been mapped as Important Habitat for swift parrot will be affected during development. This area was identified as PCT 3320_mown condition vegetation which includes representative species (<i>Eucalyptus tereticornis</i>) of PCT 3320. The swift parrot Important Habitat area in the BOAMS also include 0.013 ha of planted natives and 0.09 ha areas which were validated during field surveys as exotic grass, exotic vegetation and built areas. These areas do not provide habitat for this species.
2a. evidence of rapid decline (Principle 1, clause 6.7(2)(a) BC Regulation) presented by an estimate of <ul style="list-style-type: none"> iii. i. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or ii. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites 	Evidence of rapid decline of the population of swift parrot has been documented by Wright (2019) and by Stojanovic et al. (2018). Predictive models indicate that there is an extreme risk of population reduction due to introduced predators (Sugar gliders) in breeding habitats in Tasmania and ongoing logging (Heathcote 2020). It is currently predicted that there is only about 300 swift parrots in the wild and that this number is predicted to continue to decline (Heathcote 2020). The proposed development would not affect breeding habitat, and population declines may still occur in the absence of the development.
2b. evidence of small population size (Principle 2, clause 6.7(2)(b) BC Regulation) presented b <ul style="list-style-type: none"> iii. i. an estimate of the species' current population size in NSW, and ii. an estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and iii. where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations 	There is currently no specific data on the current population for swift parrot. Estimates of the population suggests there are less than 300 swift parrots remain in the wild (Heathcote 2020). The swift parrot migrates from breeding sites in Tasmania to NSW and Victoria. There are no estimates on how many swift parrots migrate directly to NSW. A regression model conducted over 16 years indicated that this species has sustained a decline of 90% of the entire population (Hingston 2019).
2c. evidence of limited geographic range for the threatened species (Principle 3, clause 6.7(2)(c) BC Regulation) presented b <ul style="list-style-type: none"> iii. i. extent of occurrence ii. area of occupancy 	The swift parrot is a highly mobile species which breeds in Tasmania and migrates annually to mainland Australia in winter. The remaining population of swift parrot is considered one whole population due to its highly mobile nature. The area of occupancy has significantly declined since European settlement due to ongoing habitat removal (TSSC

Impact Assessment Provision	Assessment
<p>iii. number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and</p> <p>iv. whether the species' population is likely to undergo extreme fluctuations</p>	<p>2016). In NSW 70% of box-ironbark forest habitat has been removed (TSSC 2016).</p> <p>The swift parrot has a high site fidelity to breeding sites in Tasmania. In NSW the population is not limited by a geographic range. This species will utilise key flowering events throughout NSW and Victoria. Threats to foraging habitat is not defined by geographically or ecologically distinct areas.</p> <p>This species distribution fluctuates in response to availability of foraging resources which in turn, may result in fluctuations to its population.</p>
<p>2d. evidence that the species is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation) because</p> <p>iii. i. known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g. species is clonal) on, a biodiversity stewardship site</p> <p>ii. the species is reliant on abiotic habitats which cannot be restored or replaced (e.g. karst systems) on a biodiversity stewardship site, or</p> <p>iii. life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g. frogs severely impacted by chytrid fungus).</p>	<p>There are no management actions recorded in the TBDC.</p> <p>This species relies upon foraging resources and nesting hollows in Tasmania.</p> <p>Restoration of breeding and non-breeding habitats will benefit this species.</p>
<p>3. Where the TBDC indicated that data is 'unknown' or 'data deficient' for a TEC for a criterion listed in subsection 9.1.1(2), the assessor must record this in the BDAR or BCAR.</p>	<p>The TBDC has not identified any criterion as data deficient.</p>
<p>4a. the impact on the species' population (Principles 1 and 2) presented b</p> <p>iii. i. an estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and</p> <p>ii. an estimate of the number of individuals (mature and immature) to be impacted by the proposal and as a percentage of the total NSW population, or</p> <p>iii. if the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the proposal</p>	<p>The swift parrot is a winter migrant to NSW. This species breeds in Tasmania and is considered one population. It is estimated approximately 300 individuals remaining in the wild.</p> <p>A small portion (0.002 ha of PCT 3320) of the subject land was mapped on the Important Habitat map for swift parrot. An additional 0.016 ha was planted natives and 0.09 ha of area Important Habitat which includes exotic vegetation, exotic grass and built areas.</p> <p>The mapped Important Habitat present in the subject land indicates that there has been a BioNet record for this species and the surrounding PCTs have been included as a buffer around the BioNet record. The Important Habitat map has utilised the same boundary as the Biodiversity Values map. Field surveys identified that vegetation within the Biodiversity Values map is not consistent with a PCT and should be excluded.</p> <p>The subject land intercepts with the outer portion of the Important Habitat mapped for the swift parrot. This includes 0.002 ha of vegetation mapped as PCT 3320_mown to be</p>

Impact Assessment Provision	Assessment
<p>4b. impact on geographic range (Principles 1 and 3) presented b</p> <p>iii. i. the area of the species' geographic range to be impacted by the proposal in hectares, and a percentage of the total AOO, or EOO within NSW</p> <p>ii. the impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted</p> <p>iii. to determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g. seed dispersal) and pollination distance for the species</p> <p>iv. to determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites. Where these factors have been considered elsewhere in relation to the target species, the assessor may refer to the relevant sections of the BDAR or BCAR.</p>	<p>removed. The vegetation consists of low condition native vegetation with no midstorey and mown ground layer.</p> <p>A small area 0.002 ha of the development footprint was mapped as Important Habitat for swift parrot under the BOAMS and has been included in the species polygon.</p> <p>The entire population of swift parrot is considered one population. This population is not reliant on the vegetation mapped within the subject land.</p> <p>The proposed development will reduce the habitat available to the population for foraging by direct removal of a small extent of vegetation. Approximately one <i>Eucalyptus tereticornis</i> will be removed. The vegetation is unlikely to provide significant habitat for this winter migratory species as this species is likely to utilise a large area and movement is response to presence of foraging resources. Furthermore, the vegetation mapped within the Important Habitat for this species consist of vegetation in low condition, meaning it contains some disturbances and weeds. It is not considered vital to any swift parrot utilising the area.</p> <p>The proposed development will result in a reduction of marginal foraging resources for the swift parrot, additionally, the proposed development will result in threats to individuals within the population such as a decrease in the quality and quantity of retained vegetation due to changes in fire resume and tree pathogens.</p> <p>The proposed development is unlikely to result in changes to threats affecting the habitat for swift parrot. The bushfire assessment will ensure that APZs are located outside of the VMP. The VMP will ensure the protection of the swift parrot habitat including revegetation works and the protection against environmental factors.</p> <p>Given that this species is highly mobile the removal of vegetation for the development will not fragment a population. The land retained within the subject land will aid in the dispersal of this species by providing a connective corridor to adjacent lands.</p>

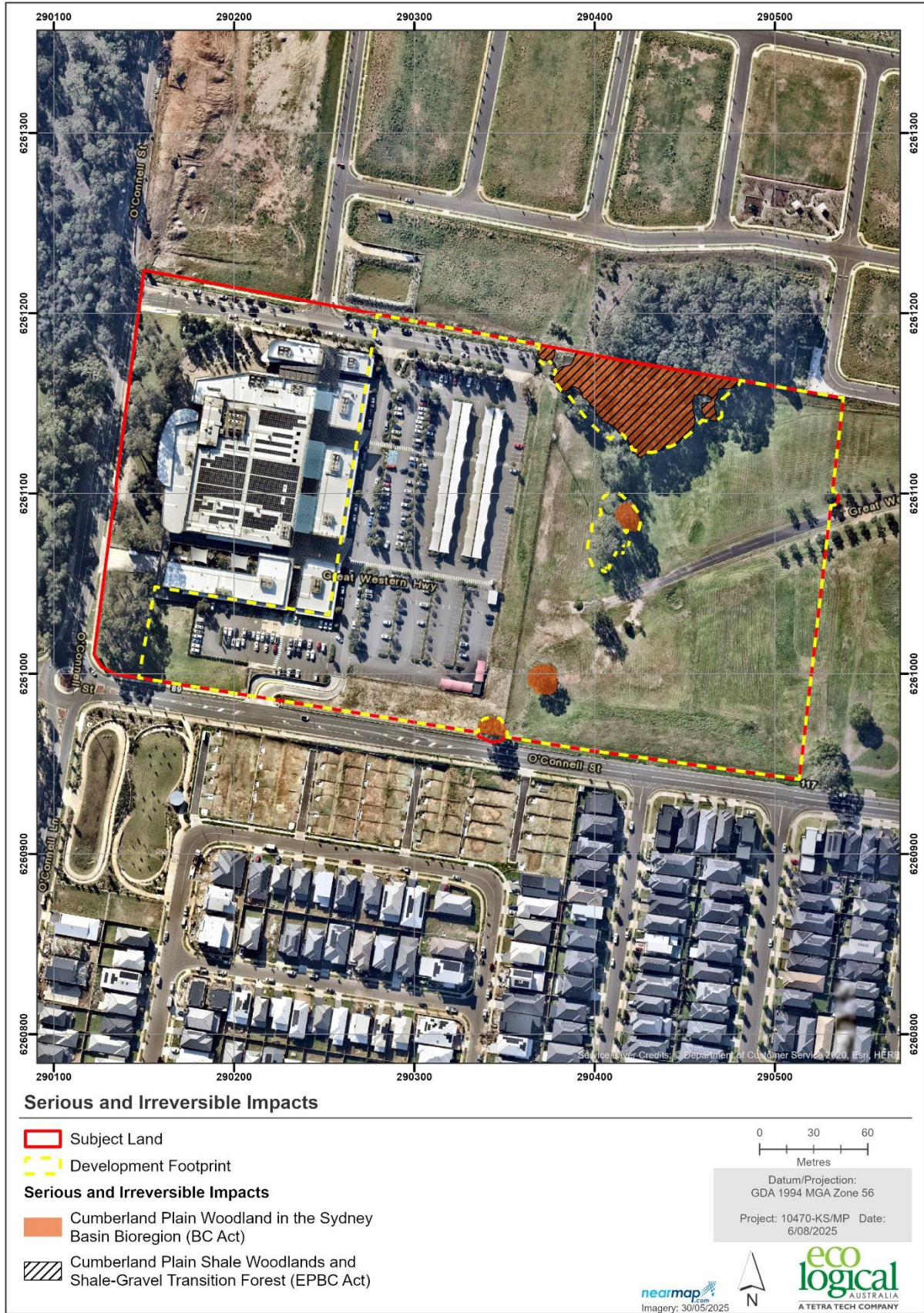


Figure 23: Serious and Irreversible Impacts – Cumberland Plain Woodland

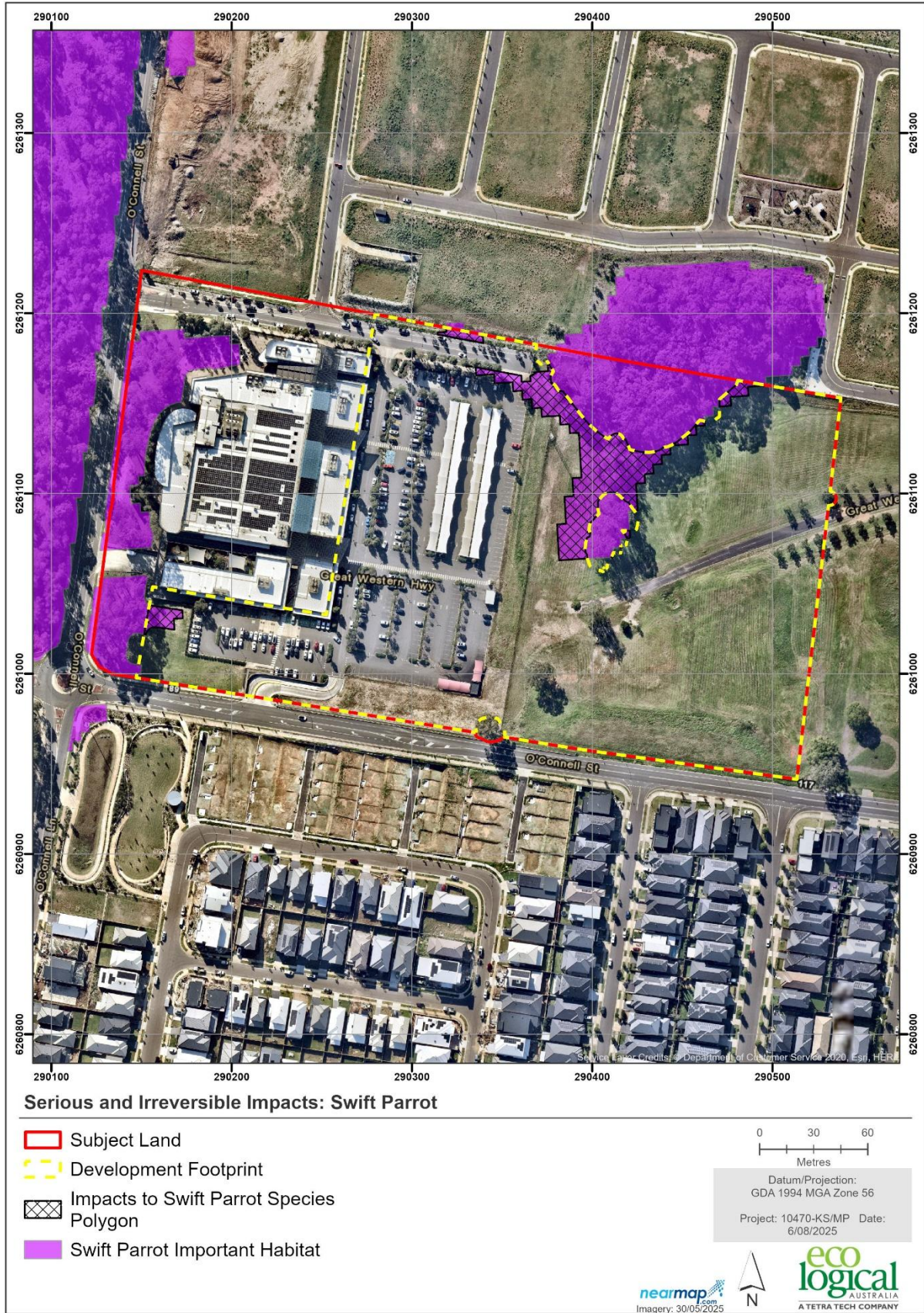


Figure 24: Serious and Irreversible Impacts – Swift parrot

8.1.2 Impacts requiring offsets

The impacts of the development requiring offset for native vegetation are outlined in Table 39 and shown on Figure 25. The impacts of the development requiring offset for species credit species and their habitat are outlined in Table 40 and shown on Figure 25.

The impacts to one hollow-bearing tree in exotic vegetation have been included in Figure 25. It is noted that impacts to species credit species for BAM Assessment Module – Small Areas only includes SAIL entities. None of the SAIL entities are considered to utilise the small tree hollows within the exotic vegetation. As such, the hollows represent are considered habitat for non-threatened fauna or non-SAIL entities. The impacts to the hollow have been offset through installation of supplementary nest boxes of suitable small entrance for birds or microbats within the VMP area.

Table 39: Impacts to native vegetation that require offsets

Veg Zone	PCT ID	PCT Name	Vegetation Class	Vegetation Formation	Direct impact (ha)
1	3320	Cumberland Shale Plains Woodland	Coastal Valley Grassy Woodlands	Grassy Woodlands	0.02

Table 40: Impacts on threatened species and species habitat that require offsets

Species	Common Name	Direct impact number of individuals / habitat (ha)	BC Act listing status	EPBC Act Listing status
<i>Lathamus discolor</i>	Swift parrot	0.002 ha	Endangered	Critically Endangered

8.1.3 Impacts not requiring offsets

The impacts of the development not requiring offset for planted native vegetation (0.19 ha) are outlined in Figure 26.

8.1.4 Areas not requiring assessment

Areas not requiring assessment within the development footprint include those mapped as exotic (0.55 ha), exotic grass (2.99 ha) and built (2.07 ha). These areas were not mapped as part of a PCT, nor did they contain habitat for threatened species. Areas not requiring assessment are shown on Figure 27.

8.1.5 Credit summary

The number of ecosystem credits required for the development are outlined in Table 41. The number of species credits required for the development are outlined in Table 42.

A biodiversity credit report is included in Appendix E.

Table 41: Ecosystem credits required

Veg zone	PCT ID	PCT Name	Like for Like credits / Trading Group	Direct impact (ha)	Credits required
1	3320	Cumberland Shale Plains Woodland	PCT 724, 808, 3320, 850	0.02	1

Veg zone	PCT ID	PCT Name	Like for Like credits / Trading Group	Direct impact (ha)	Credits required
			with hollow-bearing trees Cumberland, Burragorang, Pittwater, Sydney Cataract, Wollemi and Yengo IBRA region OR Any IBRA subregion within 100 km of the outer edge of the impacted site		

Table 42: Species credits required

Species	Common name	Direct impact number of individuals / habitat (ha)	Credits required
<i>Lathamus discolor</i>	Swift parrot	0.002 ha of PCT 3320	1



Figure 25: Impacts to vegetation requiring offset

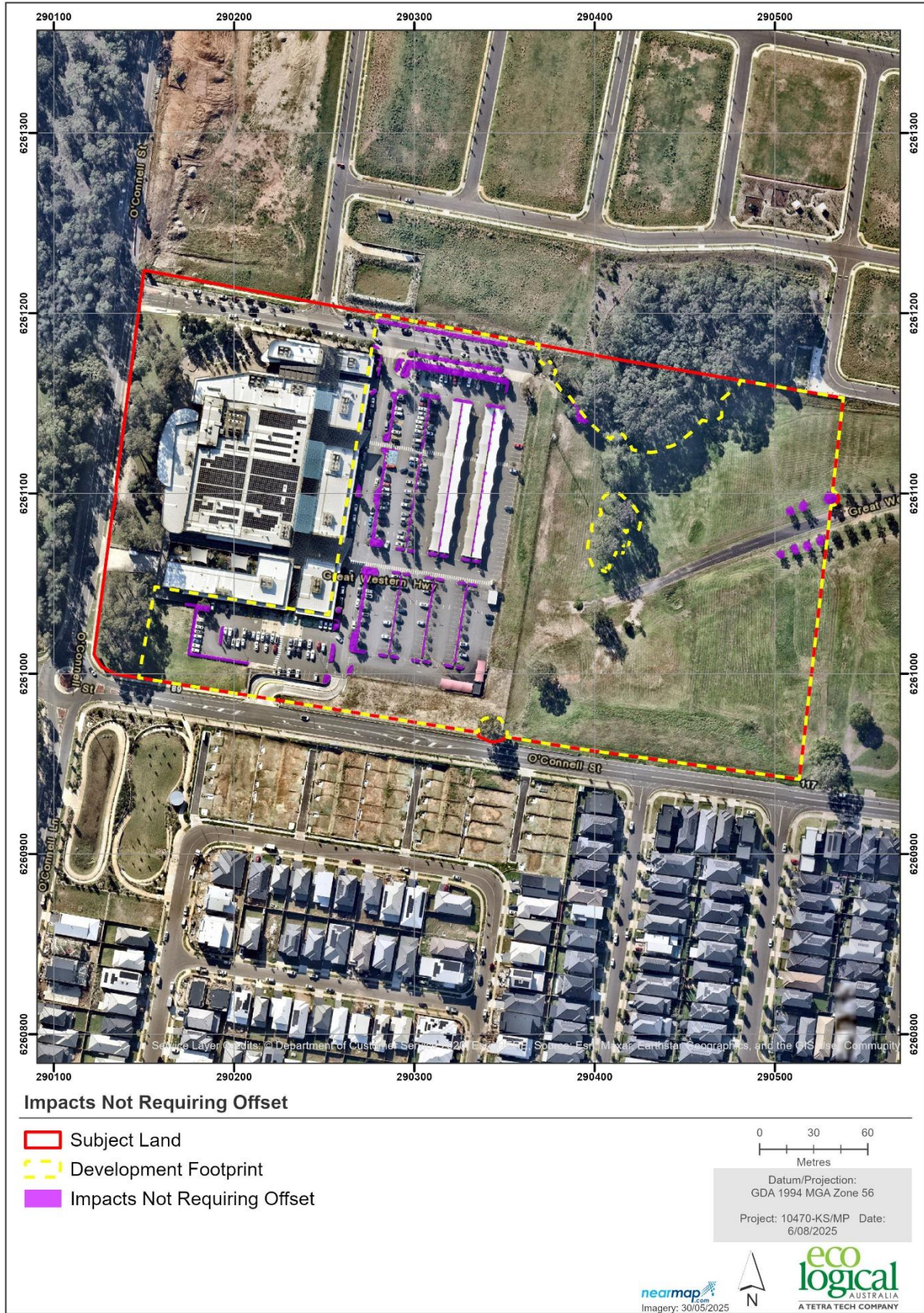


Figure 26: Impacts not requiring offset



Figure 27: Areas not requiring assessment

9. Consistency with legislation and policy

Additional matters relating to impacts on flora and fauna which are not covered by the BC Act must also be addressed for the proposed development. Potential “Matters of National Environmental Significance” (MNES) in accordance with the EPBC Act have been addressed in Section 9.1.

9.1 *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where “Matters of National Environmental Significance” (MNES) may be affected. Under the Act, any action which “has, will have, or is likely to have a significant impact on a matter of MNES” is defined as a “controlled action”, and requires approval from the Commonwealth Department of Agriculture, Water and Environment (DCCEEW), which is responsible for administering the EPBC Act.

The process includes undertaking and Assessment of Significance for listed threatened species and ecological communities that represent a matter of MNES that will be affected as a result of the proposed action. Significant impact guidelines that outline a number of criteria have been developed by the Commonwealth of Australia (2013), to provide assistance in conducting the Assessment of Significance and help decide whether or not a referral to the Commonwealth is required.

Three MNES have been assessed as part of this assessment:

- *Pteropus poliocephalus* (Grey-headed flying-fox)
- *Lathamus discolor* (Swift parrot)
- *Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest*

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

The grey-headed flying-fox is listed as a Vulnerable species under the EPBC Act.

This species utilises a wide variety of habitats (including disturbed areas) for foraging and have been recorded travelling long distances on feeding forays. Fruits and flowering plants of a wide variety of species are the main food source. Roost sites are typically located near water, such as lakes, rivers or the coast, but the species has also been known to form camps in urban areas (DCCEEW 2025b).

The closest bat camp is Ropes Creek approximately 6.5 km east of the subject land. The last survey count in February 2022 recording 2,500-9,999 individuals. The closest nationally recognised Grey-headed Flying-fox camp is located at Parramatta Park 25 km from the subject land.

The vegetation within the subject land provides potential seasonal foraging habitat. It is considered likely that this species would use the site on occasion for foraging purposes. According to the National Flying-fox Monitoring Program, no grey-headed flying-fox camps currently occur or have been recorded within the subject land.

Table 43: EPBC Act Assessment of Significance for *Pteropus poliocephalus* (Grey-headed Flying-fox)

Criterion	Response
Criterion a: Lead to a long-term decrease in the size of an important population of a species	<p>The Grey-headed Flying-fox is considered one population due to the constant exchange of genetic material between individuals and its movement between camps throughout its entire geographic range (DCCEEW 2025b). Maternity or other roosting habitat are considered important habitat for this species.</p> <p>No roosting habitat (i.e. camps) have been recorded within the subject land. According to the National Flying-fox Monitoring Program, no camps currently occur or have ever been recorded within the proposed action area (DCCEEW 2025b). The nearest active Grey-headed Flying-fox camp occurs approximately 6.5 km to the east of the proposed action area, within Paramatta Park (DCCEEW 2025b).</p> <p>The proposed action area contains 0.32 ha of potential foraging habitat for the Grey-headed Flying-fox which will be retained. About 0.02 ha of PCT 3320 and 0.19 ha of planted native species will be removed.</p> <p>Additional foraging habitat was recorded within the broader locality of the action, this includes the patch of vegetation in the north and a patch in the west on the Western Sydney University Kingswood site. Given the proximity of suitable habitat within the assessment area, the removal of this potential foraging habitat is unlikely to lead to the long-term decrease in the size of an important population of Grey-headed Flying-fox.</p>
Criterion b: Reduce the area of occupancy of an important population	<p>The proposed action will reduce the extent of available foraging habitat for the Grey-headed Flying-fox. About 0.02 ha of potential foraging habitat will be removed, and 0.32 ha will be retained within the action area. The vegetation within the subject land may provide supplementary foraging habitat for this species. The proposed action area does not contain breeding or sheltering habitat (i.e. bat camps). The Grey-headed Flying-fox is known to fly long distances (up to 50 km per night) and move between bat camps. As such this species is likely to utilise a large extent of habitat around the nationally important camp at Parramatta Park or local camp at Ropes Creek. Due to the extent of habitat within a 50 km radius of the known bat camps, the removal of a small amount of native vegetation is unlikely to significantly reduce the area of occupancy for this species.</p>

Criterion	Response
Criterion c: Fragment an existing important population into two or more populations	The proposed action will affect 0.02 ha of potential foraging habitat in the form of PCT 3320 and 0.19 ha of planted native species within the action area. The proposed action will not affect camps. Additionally, due to the highly fragmented nature of the vegetation within the action area, it is likely that the vegetation affected by the action is considered marginal or supplementary foraging habitat for this species. A large amount of intact better-quality native vegetation was identified directly west of the subject land, within Western Sydney University Kingswood. The Grey-headed Flying-fox is a highly mobile species and is considered part of one large population. As the vegetation within the action area is considered supplementary habitat for this species, it is unlikely that the proposed works will result in the fragmentation of populations for this highly mobile species.
Criterion d: Adversely affect habitat critical to the survival of a species	The National Recovery Plan for the Grey-headed Flying-fox 2021 identifies 'a continuous temporal sequence of productive foraging habitats and suitable roosting habitat' as habitat critical to the survival of the species. No camps will be affected by the proposed action. The proposed action will affect 0.02 ha of PCT 3320 and 0.19 ha of planted native vegetation, some of which comprises suitable foraging habitat for the Grey-headed Flying-fox. The Grey-headed Flying-fox is recorded as travelling long distances (50 km) on feeding forays and suitable habitat is available outside of the action area.
Criterion e: Disrupt the breeding cycle of an important population	The proposed action will affect 0.02 ha of PCT 3320 and 0.19 ha of planted native vegetation, some of which comprises suitable foraging habitat for the Grey-headed Flying-fox. The proposed action will not disrupt the breeding cycle of the Grey-headed Flying-fox given that no camps will be impacted by the proposed action and suitable foraging habitat is available adjacent to the subject land.
Criterion f: Adversely affect habitat critical to the survival of a species; modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed action will affect 0.02 ha of PCT 3320 and 0.19 ha of planted native vegetation, including foraging habitat for the Grey-headed Flying-fox. Grey-headed Flying-fox camps will not be removed, or disturbed, and suitable habitat is available outside of the action area.
Criterion g: Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to the Grey-headed Flying-fox.
Criterion h: Introduce disease that may cause the species to decline	Grey-headed Flying-fox are reservoirs for the Australian bat lyssavirus and can cause clinical disease and mortality in Grey-headed Flying-fox. The proposed action would not increase the incidence of this disease.
Criterion i: Interfere substantially with the recovery of the species	The National Recovery Plan for the Grey-headed Flying-fox was developed in 2021. The relatively small amount of foraging habitat to be removed is unlikely to substantially interfere with the recovery of this species.

Criterion	Response
Conclusion	<p>No. The proposed action is unlikely to have a significant impact on the Grey-headed Flying-fox for the following reasons:</p> <ul style="list-style-type: none">• No camps will be removed by the proposed action.• No vegetation will be further fragmented resulting in isolation of populations.• More suitable foraging habitat for this highly mobile species is available outside of the action area.

9.1.2 Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest

The proposed development will not directly impact upon the patch of PCT 3320 Cumberland Plain Woodland which corresponds to the Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest listed as critically endangered under the EPBC Act. As a precautionary approach, an assessment of indirect impacts such as sedimentation, shadowing, fragmentation, changes to hydrological flows have been considered. The implementation of a sediment and erosion control plan will assist in mitigation of potential sedimentation during construction; however, this assessment has considered ongoing sedimentation from waterflow. Introduction of weed propagules will be managed through the VMP.

Table 44: EPBC Act Assessment of Significance for Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest

Criterion	Question	Response
	An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:	
1)	reduce the extent of an ecological community	<p>The proposed action was redesigned in 2025 to avoid all direct impacts to vegetation comprising of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest within the subject land. The entire patch of 0.32 ha of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest will be retained and protected under a VMP.</p> <p>The local occurrence has been defined as the vegetation patch within the subject land and in the adjoining land to the south. It represents approximately 0.9 ha of this TEC.</p> <p>The project will retain 100% of the extent of the critically endangered community mapped within the subject land which represents 30% of the local occurrence (assuming the patch of PCT 3320 is 1 ha). The project may result in a slight reduction in the ability for the TEC to extend into adjacent (currently cleared lands). However, these cleared lands do not currently contain native species which may represent a native soil seedbank. Additionally, these areas are subject to a regular mowing regime which limits regeneration potential.</p>
2)	fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	<p>The proposed action has avoided direct impacts to this TEC through a redesign of the action. Therefore, the action will not result in a reduction in the size of the patch of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest mapped within the local occurrence. This patch of vegetation is contiguous with the patch in the adjoining land in the north. Other patches of this TEC are fragmented by roads and exotic grasslands from a large patch retained to the north west of the subject land.</p>
3)	adversely affect habitat critical to the survival of an ecological community	<p>The Approved Conservation Advice for Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest (DEWHA 2009) states that small remnant patches are important for long-term recovery of this community and may act as corridors and stepping-stone habitat for flora and fauna species. Therefore, the small patch of identified within the subject land may represent habitat critical to the</p>

Criterion	Question	Response
		<p>survival of this ecological community. The development does not involve direct impact to this TEC. However, there is potential for some indirect impacts from the retaining wall and during construction. The VMP will manage and protect the remaining 0.32 ha of the ecological community on site. An additional 0.42 ha is located in the adjacent lands and is considered part of the same patch (local occurrence).</p> <p>The majority of the vegetation in the local occurrence will be retained within the subject land and managed for conservation as part of a vegetation management plan.</p>
4)	<p>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</p>	<p>The proposed works are likely to modify non-living factors. The proposed works will result in the clearing of native vegetation for the installation of semi-impervious surface. This may result in the alteration of surface water drainage patterns. These impacts will be mitigated through the vegetation to be retained and through implementation of a VMP.</p>
5)	<p>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</p>	<p>The proposed action will not directly affect Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest. There may be some indirect impacts to the 0.32 ha of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest retained within the site. Indirect impacts will be managed through the implementation of a VMP.</p> <p>The proposed action is unlikely to result in a decline or loss of functionally important species as the area will be actively managed for conservation.</p>
6) i	<p>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</p>	<p>The proposed action is unlikely to result in reduction of quality or integrity of the vegetation as the area will be actively managed for conservation. This will include managing the retained vegetation against impacts from invasive species. The vegetation management plan in the long-term will improve the quality and integrity of the retained vegetation through the removal of weeds and implementation of pest management actions.</p>
6) ii	<p>cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: 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</p>	<p>As per above. The implementation of the vegetation management plan will provide guidance on how to actively manage the retained vegetation. This will include the correct use herbicides in the VMP area.</p>
7)	<p>interfere with the recovery of an ecological community.</p>	<p>There is no Recovery Plan for this TEC listed under the EPBC Act. The Approved Conservation Plan lists Regional Priority Actions relating to habitat loss, disturbance and modification.</p>
Conclusion	<p>Is there likely to be a significant impact?</p>	<p>No, the proposed action will not directly impact PCT 3320 listed under as part of the Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest and is</p>

Criterion	Question	Response
		<p>unlikely to have a significant impact for the following reasons:</p> <ul style="list-style-type: none"> • No direct impacts to this vegetation patch will occur. • 0.32 ha will be retained on site • Indirect impacts will be managed under a VMP. • The action does not fragment the vegetation. <p>The proposed action will mitigate additional impacts on the retained vegetation through the implementation of a vegetation management plan.</p>

9.1.3 *Lathamus discolor* (Swift parrot)

The swift parrot is listed as critically endangered under the EPBC Act. The distribution and habitat associations of this threatened species is presented in Appendix F. This species was not recorded within the subject land, however, a small portion of the DPE mapped Important Habitat has been identified within the development footprint and within the land for conservation measures. The proposed action will impact 0.002 ha of potential foraging habitat for Swift parrot.

Criterion	Response
Criterion a: Will the action lead to a long-term decrease in the size of a population	<p>The proposed action will affect 0.002 ha of native vegetation which represents potential foraging habitat for the swift parrot. The remaining portion of the mapped Important Habitat contains unsuitable habitat for foraging for this species including; 0.01 ha of planted natives, 0.19 ha of exotic grass, 0.09 ha of exotic species and 0.02 ha of built areas.</p> <p>The swift parrot is a non-breeding migratory species to NSW. The entire population of swift parrot is considered one population. It is not considered that the foraging habitat comprises habitat for an important population, due to the presence of more extensive habitat adjacent to the subject land. A small area mapped on the Important Habitat was located within the development footprint and a larger amount within the to be retain within the subject land. This area represents non-breeding foraging habitat for swift parrot. The development intercepts the outer edge of the mapped habitat. It is unlikely that minor impacts to 0.002 ha of native vegetation mapped on the Important Habitat would result in the long-term decrease in the size of the population of swift parrot.</p>
Criterion b: Will the action reduce the area of occupancy of the species	<p>The proposed action would reduce the amount of potential foraging habitat for this species by up to 0.002 ha of PCT 3320. The swift parrot is not known to breed within the subject land but may forage within the vegetation mapped within the subject land. A small portion 0.002 ha of land mapped on the Important Habitat will be impacted by the development footprint. This area is located within a patch of disturbed native vegetation. It is not considered that the subject land comprises of foraging habitat for an important population therefore the proposed action will not reduce the area of occupancy of an important population.</p>
Criterion c: Will the action fragment an existing population into two or more populations	<p>The proposed action will not fragment an existing important population into two or more populations.</p>
Criterion d: Will the action adversely affect habitat critical to the survival of a species	<p>The 2011-2015 National Recovery Plan for this species identifies the following as habitat critical to the survival of the species: breeding habitat and over-wintering habitat. No critical habitat for this species was identified within the subject land. However, a small portion of the land contains mapped Important Habitat for this species. Considering that only 0.002 ha of suitable foraging habitat will be affected, and more similar, and extensive habitat is available within and adjacent to the subject land, the proposed action is considered unlikely to adversely affect critical habitat for this species.</p>
Criterion e: will the action disrupt the breeding cycle of a population	<p>The proposed action will not disrupt the breeding cycle of the swift parrot given that no breeding habitat will be affected by the proposed action and suitable foraging habitat is available within and adjacent to the subject land.</p>
Criterion f: Adversely affect habitat critical to the survival of a species; modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that	<p>The proposed action will affect 0.002 ha of vegetation, including foraging habitat for the swift parrot. It is unlikely that the extent of this vegetation removal will cause the species to decline because suitable, and extensive habitat is available within and adjacent to the subject land. The removal of vegetation from within the subject land will not fragment or isolate any habitat.</p>

Criterion	Response
the species is likely to decline	
<p>Criterion g: Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat</p>	<p>The proposed action is unlikely to result in the establishment of an invasive species in the habitat of the swift parrot.</p>
<p>Criterion h: will the action introduce disease that may cause the species to decline</p>	<p>The action is unlikely to introduce disease that would cause this species to decline.</p>
<p>Criterion I: will the action interfere with the recovery of the species</p>	<p>The 2011-2015 National Recovery Plan for this species identifies the following potential threats: habitat loss and adult mortality.</p> <p>The proposed action will impact foraging habitat; and may result in an increase in vehicles resulting in higher bird collisions. However, the action is unlikely to exacerbate these threats to the extent that it would interfere substantially with the recovery of the species.</p>
<p>Conclusion</p>	<p>No. The proposed action is unlikely to have a significant impact on the swift parrot for the following reasons:</p> <ul style="list-style-type: none"> • No breeding habitat will be impacted by the action. • The species is highly mobile and will continue to access different areas of habitat.

10. Conclusion

Eco Logical Australia (ELA) was engaged by Caddens Estate Pty Ltd to prepare a Streamlined (small area) Biodiversity Development Assessment Report (BDAR) for 68-80 O'Connell Street Caddens (the subject land) within the Penrith local government area. The proposal involves the removal of a marginal amount of native vegetation and existing carpark structures, and the construction of a combination of shop-top housing, residential flat buildings, and a commercial premises (shop) and ancillary land use to support the functions intended for the subject land.

This report considers the biodiversity values within the development footprint; describes the indicative impacts; and outlines the measures to be taken to avoid, minimise and mitigate impacts to the vegetation and species habitat present within the subject land.

This report has followed the BAM 2020 established under Section 6.7 of the BC Act. The Small Area Streamlined Assessment Module, and the Planted Native Vegetation Streamlined Assessment Module were used in this report. The BDAR has calculated the number of biodiversity credits that would be required to be retired if the development proceeds as described and has provided the relevant Significance Assessments under the Commonwealth EPBC Act.

The subject land contains carpark areas and exotic grassland and other areas. The subject land is extensively disturbed from previous land clearing and ongoing mowing practices. One Plant Community Type PCT 3320 Cumberland Plain Woodland was recorded within the development footprint in low condition. PCT 3320 is associated with a threatened ecological community (TEC), listed as critically endangered under the BC Act and EPBC Act. The proposed development will affect 0.02 ha of PCT 3320 which represents part of the BC Act listing but did not meet the criteria for EPBC Act. This TEC is also a candidate SAI entity and therefore, a SAI assessment was prepared for this entity. The proposal has demonstrated avoidance to impacts to PCT 3320 through retaining the patches of PCT 3320 in the subject land including 0.32 ha patch which will be protected under a Vegetation Management Plan (ELA 2025a). Cumberland Plain Woodland is also listed as a candidate for Serious and Irreversible Impact (SAII) entity and assessed in this report. Ecosystem credits required as a result of the proposed development are presented below.

Ecosystem credits required

Vegetation zone	PCT #	PCT name	Condition	Vegetation integrity score	Offset Group	Trading	Direct impact (ha)	Credit required
1	3320	Cumberland Shale Plains Woodland	mown	57.1	Coastal Grassy Woodlands	Valley	0.02	1

A second PCT, PCT 4025 Cumberland Red Gum Riverflat Forest was also recorded within the subject land, but it was not located within the development footprint. This PCT is associated with the *endangered River-Flat Eucalypt Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions* listed under the BC Act. Vegetation patches of high quality PCT 4025 may also represent part of the critically endangered *River-flat eucalypt forest on coastal floodplains of*

southern New South Wales and eastern Victoria under the EPBC Act. However, the vegetation patch lacked native ground cover and midstorey species and therefore, did not satisfy the criteria for listing under the EPBC Act. No direct impacts would occur on this TEC. This TEC is not listed as a Serious and Irreversible Impact entity. Mitigation measures have been included to protect the patch from indirect impacts.

Under the BAM small areas assessment module only those species credit species which are at risk of a SAI require assessment. A list of candidate species credit species which may occur on the subject land and are at risk of an SAI were determined.

An assessment of these species' habitat constraints against the available habitat within the subject land was undertaken. A small patch of Important Habitat for *Lathamus discolor* (swift parrot) was mapped within the vegetation in the north of the subject land. The majority of this patch will be retained. This vegetation may provide important wintering foraging habitat for this migratory species. A species polygon was prepared and a total of one (1) species credits area required for 0.02 ha of impacts to swift parrot habitat. Effort to retain native vegetation including vegetation which corresponds with PCT 3320, and swift parrot Important habitat has been documented in this BDAR.

No other habitat for candidate species credit species was recorded within the subject land, therefore no targeted surveys or further assessment was required.

The remaining vegetation within the subject land was either planted native species, or cleared land dominated by exotic grasses and weeds. Planted native vegetation was assessed as part of the Streamlined Assessment module – planted native vegetation.

Three Matters of National Environmental Significance (MNES), *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*, *Pteropus poliocephalus* (grey-headed flying-fox) and swift parrot were identified as having potential to be affected by the proposed works. The assessment of significance concluded that the proposed development is unlikely to cause a significant impact to these three MNES. A referral to the Commonwealth is not recommended.

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Appendix A : Definitions

Terminology	Definition
Biodiversity credit report	The report produced by the Credit Calculator that sets out the number and class of biodiversity credits required to offset the remaining adverse impacts on biodiversity values at a subject land, or on land to be biodiversity certified, or that sets out the number and class of biodiversity credits that are created at a biodiversity stewardship site.
BioNet Atlas	The BioNet Atlas (formerly known as the NSW Wildlife Atlas) is the OEH database of flora and fauna records. The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails) and some fish
Broad condition state	Areas of the same PCT that are in relatively homogenous condition. Broad condition is used for stratifying areas of the same PCT into a vegetation zone for the purpose of determining the vegetation integrity score.
Buffer area	1500 m buffer created around the subject land. This area is used to define the extent of native vegetation.
Connectivity	The measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.
Credit Calculator	The computer program that provides decision support to assessors and proponents by applying the BAM, and which calculates the number and class of biodiversity credits required to offset the impacts of a development or created at a biodiversity stewardship site.
Development	Has the same meaning as development at section 4 of the EP&A Act, or an activity in Part 5 of the EP&A Act. It also includes development as defined in section 115T of the EP&A Act.
Development footprint	The area of land that is directly impacted on by a proposed development, including access roads, and areas used to store construction materials.
Development site	An area of land that is subject to a proposed development that is under the EP&A Act.
Ecosystem credits	A measurement of the value of EECs, CEECs and threatened species habitat for species that can be reliably predicted to occur with PCT. Ecosystem credits measure the loss in biodiversity values at a subject land and the gain in biodiversity values at a biodiversity stewardship site.
High threat exotic plant cover	Plant cover composed of vascular plants not native to Australia that if not controlled will invade and outcompete native plant species.
Hollow bearing tree	A living or dead tree that has at least one hollow. A tree is considered to contain a hollow if: (a) the entrance can be seen; (b) the minimum entrance width is at least 5 cm; (c) the hollow appears to have depth (i.e. you cannot see solid wood beyond the entrance); (d) the hollow is at least 1 m above the ground. Trees must be examined from all angles.
Important wetland	A wetland that is listed in the Directory of Important Wetlands of Australia (DIWA) and SEPP 14 Coastal Wetlands.
Linear shaped development	Development that is generally narrow in width and extends across the landscape for a distance greater than 3.5 kilometres in length.
Local population	The population that occurs in the study area. In cases where multiple populations occur in the study area or a population occupies part of the study area, impacts on each subpopulation must be assessed separately.
Local wetland	Any wetland that is not identified as an important wetland (refer to definition of Important wetland).
Mitchell landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000.

Terminology	Definition
Multiple fragmentation impact development	Developments such as wind farms and coal seam gas extraction that require multiple extraction points (wells) or turbines and a network of associated development including roads, tracks, gathering systems/flow lines, transmission lines
Operational Manual	The Operational Manual published from time to time by OEH, which is a guide to assist assessors when using the BAM
Patch size	An area of intact native vegetation that: a) occurs on the subject land or biodiversity stewardship site, and b) includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤ 30 m for non-woody ecosystems). Patch size may extend onto adjoining land that is not part of the subject land or stewardship site.
Proponent	A person who intends to apply for consent to carry out development or for approval for an activity.
Reference sites	The relatively unmodified sites that are assessed to obtain local benchmark information when benchmarks in the Vegetation Benchmarks Database are too broad or otherwise incorrect for the PCT and/or local situation. Benchmarks can also be obtained from published sources.
Regeneration	The proportion of over-storey species characteristic of the PCT that are naturally regenerating and have a diameter at breast height < 5 cm within a vegetation zone.
Remaining impact	An impact on biodiversity values after all reasonable measures have been taken to avoid and minimise the impacts of development. Under the BAM, an offset requirement is calculated for the remaining impacts on biodiversity values.
Retirement of credits	The purchase and retirement of biodiversity credits from an already-established biobank site or a biodiversity stewardship site secured by a biodiversity stewardship agreement.
Riparian buffer	Riparian buffers applied to water bodies in accordance with the BAM.
Sensitive biodiversity values land map	Development within an area identified on the map requires assessment using the BAM.
Site attributes	The matters assessed to determine vegetation integrity. They include: native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.
Site-based development	a development other than a linear shaped development, or a multiple fragmentation impact development.
Species credits	The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Biodiversity Data Collection.
Subject land	Is land to which the BAM is applied in Stage 1 to assess the biodiversity values of the land. It includes land that may be a subject land, clearing site, proposed for biodiversity certification or land that is proposed for a biodiversity stewardship agreement.
Threatened Biodiversity Data Collection	Part of the BioNet database, published by OEH and accessible from the BioNet website.
Threatened species	Critically Endangered, Endangered or Vulnerable threatened species as defined by Schedule 1 of the BC Act, or any additional threatened species listed under Part 13 of the EPBC Act as Critically Endangered, Endangered or Vulnerable.

Terminology	Definition
Vegetation Benchmarks Database	A database of benchmarks for vegetation classes and some PCTs. The Vegetation Benchmarks Database is published by OEH and is part of the BioNet Vegetation Classification.
Vegetation zone	A relatively homogenous area of native vegetation on a subject land, land to be biodiversity certified or a biodiversity stewardship site that is the same PCT and broad condition state.
Wetland	An area of land that is wet by surface water or ground water, or both, for long enough periods that the plants and animals in it are adapted to, and depend on, moist conditions for at least part of their life cycle. Wetlands may exhibit wet and dry phases and may be wet permanently, cyclically or intermittently with fresh, brackish or saline water
Woody native vegetation	Native vegetation that contains an over-storey and/or mid-storey that predominantly consists of trees and/or shrubs

Appendix B : BOD helpdesk correspondence

B1 Current SSDA request July 2025

BAM-C operation.

The BAM-C does not provide the option for SSD streamlined assessments, please refer to the below suggested method for enabling a small area assessment for an SSD in the BAM-C.

In the BAM-C, please choose Assessment Type: Part 4 Development (Small Area), then select 'BOS Threshold: Biodiversity Values Map and area clearing threshold' and note this selection, and the reasons for it, in the BDAR.

B2 Previous BOS correspondence

Gabrielle Ryan commented:

Hi [Belinda Falles](#)

Thank you for your enquiry.

The BOS Subject Matter Officer has provided the following response to your enquiry:

Ultimately it is the consent authority that must be satisfied with the information provided to support the SSD application. Please engage early and seek approval to apply the small area streamlined assessment module.

If the original development was approved under former planning provisions, only the additional impacts on biodiversity values resulting from the development modification (not those associated with the development as approved) need to be assessed.

This project as described would meet above criteria as the original SSD application for this project was approved prior to the commencement of the *Biodiversity Conservation Act 2016*. This project may also meet the criteria for *Streamlined Assessment Module – Small Areas* (the module) in Appendix C of the Biodiversity Assessment Method (BAM).

There is currently no option for applying this module to an SSD application in the *Biodiversity Offsets and Agreement Management System* (BOAMS). The recommended systems approach is that you use the regular BAM-C option and exclude irrelevant data points (such as species credit species that are not at risk of Serious and Irreversible Impacts). This option will end up with the same calculation as if you had applied the small areas module.

The Biodiversity Development Assessment Report (BDAR) will have to:

- provide evidence of the survey results/photos and assessment undertaken to support eligibility of the streamlined assessment module for this modification.
- provide justification for the exclusion of species credit species.
- Include this communication as evidence for support of the approach to BAM-Calculator
- outline available information about the original impact of the development and consider any measures already taken to avoid, minimise or offset the impact on biodiversity values in connection with the approval before the proposed modification
- identify those offset requirements that have been discharged with documentary evidence
- assess any new impacts on biodiversity values resulting from the modification of the development in accordance with the Biodiversity Assessment Method streamlined assessment module
- identify offset requirements and any new measures to avoid and minimise impacts in accordance with the Biodiversity Assessment Method – streamlined assessment module.

Further information on the assessment requirements for a modification application can be found [here](#).

Appendix C : Vegetation plot data

Table 45: Species matrix (species recorded by plot)

Species	Common Name	Exotic (*)	High Threat Weed (*)	Growth Form Group	Plot 1		
					Stratum Layer &	Cover	Abundance
<i>Anagallis</i> spp.		*			G	0.1	2
<i>Aristida vagans</i>	Threeawn Speargrass			Grass & grasslike (GG)	G	0.1	2
<i>Asperula conferta</i>	Common Woodruff			Forb (FG)	G	0.1	3
<i>Aster subulatus</i>	Wild Aster	*			G	0.1	1
<i>Bothriochloa macra</i>	Red Grass			Grass & grasslike (GG)	G	0.2	5
<i>Chloris truncata</i>	Windmill Grass			Grass & grasslike (GG)	G	0.1	4
<i>Chloris ventricosa</i>	Tall Chloris			Grass & grasslike (GG)	G	0.2	10
<i>Commelina cyanea</i>	Native Wandering Jew			Forb (FG)	G	0.1	4
<i>Cynodon dactylon</i>	Common Couch			Grass & grasslike (GG)	G	2	100
<i>Cyperus eragrostis</i>	Umbrella Sedge	*	*		G	0.1	3
<i>Cyperus gracilis</i>	Slender Flat-sedge			Grass & grasslike (GG)	G	0.1	5
<i>Desmodium varians</i>	Slender Tick-trefoil			Other (OG)	G	1	100
<i>Dichondra repens</i>	Kidney Weed			Forb (FG)	G	4	500
<i>Ehrharta erecta</i>	Panic Veldtgrass	*	*		G	0.2	5
<i>Eragrostis curvula</i>	African Lovegrass	*	*		G	0.5	100
<i>Eragrostis leptostachya</i>	Paddock Lovegrass			Grass & grasslike (GG)	G	0.2	5
<i>Eucalyptus tereticornis</i>	Forest Red Gum			Tree (TG)	U	25	5
<i>Geranium homeanum</i>				Forb (FG)	G	0.1	2
<i>Glycine clandestina</i>	Twining glycine			Other (OG)	G	0.1	2
<i>Glycine tabacina</i>	Variable Glycine			Other (OG)	G	0.2	10
<i>Hypochaeris radicata</i>	Catsear	*			G	0.2	20
<i>Lonicera japonica</i>	Japanese Honeysuckle	*	*		G	0.1	1
<i>Lotus uliginosus</i>	Birds-foot Trefoil	*			G	0.1	3
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Grass			Grass & grasslike (GG)	G	75	1000
<i>Modiola caroliniana</i>	Red-flowered Mallow	*			G	0.1	20
<i>Nerium oleander</i>	Oleander	*			M	0.2	1
<i>Olea europaea</i> subsp. <i>cuspidata</i>	African Olive	*			M	0.2	3
<i>Oxalis corniculata</i>	Creeping Oxalis	*			G	0.1	3
<i>Paspalum dilatatum</i>	Paspalum	*	*		G	0.1	2
<i>Phyllanthus similis</i>				Forb (FG)	G	0.1	1
<i>Plantago lanceolata</i>	Lamb's Tongues	*			G	0.2	50
<i>Senecio madagascariensis</i>	Fireweed	*	*		G	0.2	50

Species	Common Name	Exotic (*)	High Threat Weed (*)	Growth Form Group	Plot 1		
					Stratum Layer &	Cover	Abundance
<i>Setaria parviflora</i>		*			G	0.1	3
<i>Sida rhombifolia</i>	Paddy's Lucerne	*			G	0.1	20
<i>Solanum nigrum</i>	Black-berry Nightshade	*			G	0.1	1
<i>Solanum pseudocapsicum</i>	Madeira Winter Cherry	*			M	0.1	1
<i>Solanum sisymbriifolium</i>		*			M	0.1	1
<i>Sonchus oleraceus</i>	Common Sowthistle	*			G	0.1	2
<i>Sporobolus creber</i>	Slender Rat's Tail Grass			Grass & grasslike (GG)	G	0.1	3
<i>Trifolium repens</i>	White Clover	*			G	0.1	3
<i>Verbena rigida var. rigida</i>	Veined Verbena	*			G	0.1	2

G = GROUND, M = MIDSTOREY, U = UNDERSTOREY. TG = TREE, SG = SHRUB, GG = GRASS AND GRASSLIKE, FG = FORB, EG = FERN, OG = OTHER
C = COVER A = ABUNDANCE

Table 46: Vegetation integrity data (Composition, structure and function)

Plot No.	PCT	Veg zone	Condition	Zone	Easting	Northing	Bearing
1	3320	1	mown	56	290391	6261171	98

Composition						
Plot no.	Tree	Shrub	Grass	Forb	Fern	Other
1	1	0	9	5	0	3

Structure (Total cover %)						
Plot no.	Tree	Shrub	Grass	Forb	Fern	Other
1	25	0	78	4.4	0	1.3

Plot no.	Large trees	Hollows	Litter cover (%)	Length fallen logs (m)	Tree stem 5-9 cm	Tree stem 10-19 cm	Tree stem 20-29 cm	Tree stem 30-49 cm	Tree stem 50-79 cm	Tree stem 80+ cm	Tree regen	HTW cover %
1	6	1	43	0	0	1	1	1	1	1	0	1.2

FOR STEM SIZE CLASS 0 = ABSENCE, 1 = PRESENCE

Table 47: Other species recorded

Species Name	Common Name	Exotic (*)
<i>Anredera cordifolia</i>	Madeira vine	x
<i>Callistemon viminalis</i>	Weeping Bottlebrush	
<i>Ehrharta erecta</i>	Panic Veldtgrass	x
<i>Galium gaudichaudii</i>	Rough Bedstraw	
<i>Ipomoea indica</i>	Blue morning glory	x
<i>Nerium oleander</i>	Oleander	x
<i>Olea europaea</i> subsp. <i>cuspidata</i>	African olive	x
<i>Senecio madagascariensis</i>	Fireweed	x
<i>Solanum nigrum</i>	Black-berry Nightshade	x
<i>Lycium ferocissimum</i>	African Boxthorn	x
<i>Solanum sisymbriifolium</i>		x

Table 48: Fauna species observed in the subject land

Class	Family	Scientific Name	Common Name	Observation Type	Exotic (*)
Amphibia	Myobatrachidae	<i>Crinia signifera</i>	Common Eastern Froglet	W	
Aves	Artamidae	<i>Cracticus tibicen</i>	Australian Magpie	O	
Aves	Artamidae	<i>Strepera graculina</i>	Pied Currawong	O	
Aves	Cacatuidae	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-cockatoo	F/O	
Aves	Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo Shrike	F/O	
Aves	Charadriidae	<i>Vanellus miles</i>	Masked Lapwing	F/O	
Aves	Corvidae	<i>Corvus coronoides</i>	Australian Raven	O	
Aves	Halcyonidae	<i>Dacelo novaeguineae</i>	Laughing Kookaburra	W	
Aves	Hirundinidae	<i>Hirundo neoxena</i>	Welcome Swallow	F/O	
Aves	Meliphagidae	<i>Manorina melanocephala</i>	Noisy Miner	O	
Aves	Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark	O	
Aves	Phalacrocoracidae	<i>Phalacrocorax varius</i>	Pied Cormorant	F/O	
Aves	Psittaculidae	<i>Psephotus haematonotus</i>	Red-rumped Parrot	O	
Aves	Pycnonotidae	<i>Pycnonotus jocosus</i>	Red Whiskered Bulbul	W	*
Aves	Sturnidae	<i>Sturnus tristus</i>	Common Myna	O	*
Aves	Sturnidae	<i>Sturnus vulgaris</i>	Common Starling	F/O	*
Aves	Threskiornithidae	<i>Threskiornis molucca</i>	Australian White Ibis	F/O	
Mammalia	Macropodidae	<i>Macropus giganteus</i>	Eastern Grey Kangaroo	O	

O= OBSERVED. W = HEARD. F/O = FLYOVER

Appendix D : Floristic analysis results

Plot / vegetation zone	Vegetation analysis tool	Selected PCT rational
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Plot 1 / vegetation zone 1	Shale Plains Woodland (PCT and a sub-community of Cumberland Plains Woodland)	Shale Plains Woodland (SPW) had 15 diagnostic species. It had the most number of diagnostic species and was identified as the most appropriate PCT for the vegetation within the subject land.
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Community Type	DSF p1	GW p2	DSF p6	DSF p7	DSF p4	GW p28	GW p29	DSF p502	WSF p87	FoW p33	WSF p88	WSF p282	RF p38	RF p39	GW p514	FoW p44	DSF p64	WSF p102	wet p153	FoW p68	DSF p142	DSF p142	DSF p142	DSF p142	DSF p131	DSF p236	HL p50	FoW p55	SL p509	FoW p104	SL p109	FoW p313
Correct ID	CIF	SSTF	BNHW	CSGW	CSW	SHW	SPW	SGTF	STIF	CRFF	NSCF	SHSW	GMDR	WSDR	MSW	SSF	CSF	LBMWF	BGHF	SRS	CSGF	HSGF	SSICF	SHTW	CSRW	ABW	SCS	RHF	ESm	EFF	EMF	CFL
total diagnostic species	2	5	1	1	1	13	15	6	5	10	0	0	6	6	10	1	2	0	0	0	0	0	0	3	0	0	0	1	0	0	0	0
required minimum +ve diagnostic species	21	26	17	30	19	20	26	25	23	16	6	3	18	22	19	9	10	20	15	8	23	26	26	31	31	20	16	2	1	1	1	2
Achieved?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
by which required minimum +ve diagnostic spp. is exceeded?	10%	19%	6%	3%	5%	65%	58%	24%	22%	63%	0%	0%	33%	27%	53%	11%	20%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	50%	0%	0%	0%	0%
ratio of actual : required +ve diagnostic species	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
total native species	35	39	37	43	37	31	31	37	40	26	27	25	31	32	30	17	21	35	39	25	38	36	43	42	41	30	24	8	2	2	2	4
Achieved?	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	Yes	Yes	No	No	No	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
ratio of +ve diagnostic species : total native species	3%	22%	4%	4%	4%	57%	65%	26%	22%	43%	0%	0%	26%	26%	43%	4%	9%	0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	4%	0%	0%	0%	0%

Appendix E : EPBC Likelihood of Occurrence

An assessment of the likelihood of occurrence was made for threatened and migratory species identified from the Protected Matters Search Tool. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the site inspection and professional judgement. Some Migratory or Marine species identified from the Commonwealth database search have been excluded from the assessment, due to lack of habitat. The terms for likelihood of occurrence are defined below:

- 'known' = the species was or has been observed on the site
- 'likely' = a medium to high probability that a species uses the site
- 'potential' = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- 'unlikely' = a very low to low probability that a species uses the site
- 'no' = habitat within the subject land and in the vicinity is unsuitable for the species.

A test of significance was conducted for threatened species or ecological communities that were recorded within the subject land or had a higher likelihood of occurring and were not recorded during the site visit. It is noted that some threatened fauna species that are highly mobile, wide ranging and vagrant may use portions of the subject land intermittently for foraging. For these fauna species, the habitat present and likely to be impacted is not considered to be important to the threatened species, particularly in relation to the amount of similar habitat remaining in the surrounding landscape. As such, a test of significance in reference to Commonwealth legislation was not considered necessary.

Information provided in the habitat associations' column has primarily been extracted (and modified) from the Commonwealth Species Profile and Threats Database and the NSW Threatened Species Data Collection.

Table 49: Likelihood of occurrence of threatened ecological communities listed under the EPBC Act.

Community Name	EPBC Status	Act	Distribution	Habitat	Likelihood of occurrence	Impact Assessment Required
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	CE		Occurs in western Sydney, with the most extensive stands occurring in the Castlereagh and Holsworthy areas. Smaller remnants occur in the Kemps Creek area and in the eastern section of the Cumberland Plain.	Mainly occurs on clay soils derived from the deposits of ancient river systems (alluvium), or on shale soils of the Wianamatta Shales.	No – while the subject land does contain shale soils, this community was not identified during field survey.	No
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	CE		Endemic to the shale hills and plains of the Sydney Basin Bioregion in NSW, occurring primarily in, but not limited to, the Cumberland Sub-region.	Flat to undulating or hilly terrain, at elevations up to approximately 350 metres above sea level. Predominantly associated with clay soils, that are derived from Wianamatta Shale geology. Minor occurrences may be present on other soil groups, notably Holocene Alluvium and soils derived from the Mittagong Formation.	Yes – PCT 3320 which is associated with this TEC, was mapped within the subject land and identified during the field survey.	Yes
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	E		Sydney Basin Bioregion, mostly in the Cumberland IBRA sub-region, with small occurrences in the Sydney Cataract, Wollemi and Burragorang sub-regions. It occurs primarily in the Castlereagh area in the north-west of the Cumberland Plain	Occurs primarily on Tertiary sands and gravels of the Hawkesbury-Nepean river system. At Agnes Banks it primarily occurs on aeolian (wind-blown) sands overlying Tertiary alluvium. Found on flat or gently undulating terrain in rain shadow areas typically receiving 700–900	No – this community was not identified during field survey.	No

Community Name	EPBC Status	Act	Distribution	Habitat	Likelihood of occurrence	Impact Assessment Required
			with other known occurrences near Holsworthy, Kemps Creek and Longneck Lagoon.	mm annual rainfall. The ecological community occurs primarily at low elevations up to 80 m above sea level (ASL), including old ridges, dunes and terraces.		
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	CE		Found on the river flats of the coastal floodplains. Known from parts of the Local Government Areas of Port Stephens, Maitland, Singleton, Cessnock, Lake Macquarie, Wyong, Gosford, Hawkesbury, Baulkham Hills, Blacktown, Parramatta, Penrith, Blue Mountains, Fairfield, Holroyd, Liverpool, Bankstown, Wollondilly, Camden, Campbelltown, Sutherland, Wollongong, Shellharbour, Kiama, Shoalhaven, Palerang, Eurobodalla and Bega Valley.	Associated with silts, clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains.	No – this community was not identified during field survey.	No
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	E		Occurs in sub-tropical, sub-humid and temperate climatic zones from Curtis Island, north of Gladstone, in Queensland to Bermagui in southern New South Wales.	Typically found where groundwater is saline or brackish, but can occur in areas where groundwater is relatively fresh. It is typically found on coastal flats, floodplains, drainage lines, lake margins, wetlands and estuarine fringes where soils	No – this community was not identified during field survey.	No

Community Name	EPBC Status	Act	Distribution	Habitat	Likelihood of occurrence	Impact Assessment Required
				are at least occasionally saturated, water-logged or inundated		
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	CE		Occurs at the edges of the Cumberland Plain in western Sydney, most now occurs in the Hawkesbury, Baulkham Hills, Liverpool, Parramatta, Penrith, Campbelltown and Wollondilly local government areas.	Intergrade between clay soils from the shale rock and earthy and sandy soils from sandstone, or where shale caps overlay sandstone.	No – this community was not identified during field survey.	No
Western Sydney Dry Rainforest and Moist Woodland on Shale	CE		Cumberland Plain Sub-region of the Sydney Basin Bioregion.	It generally occurs in rugged terrain and other patches may occur on undulating terrain, with dry rainforest patches typically occupying steep lower slopes and gullies, and moist woodland patches typically occupying upper sections of the slope. Occurs almost exclusively on clay soils derived from Wiannamatta Group shales.	No – this community was not identified during field survey.	No
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	E		Occurs on the mainland and islands near to the coast (within 20 km) within the following IBRA2 Bioregions: South East Queensland; NSW North Coast; Sydney Basin; and the Bateman subregion of the South East Corner.	The ecological community most commonly occurs at elevations below 20m above sea-level but may occur occasionally up to 220m ASL on hill slopes, for example in association with perched swamps and lakes, or a naturally high-water table.	No – the site was >40km from the coast.	No

E= ENDANGERED, CE = CRITICALLY ENDANGERED

Table 50: Likelihood of occurrence of threatened fauna listed under the EPBC Act.

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions.	Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of <i>Casuarina cunninghamiana</i> (River Oak).	35	Unlikely – marginal habitat present (PCT 3320 with <i>Eucalyptus tereticornis</i>), but minimal records of species within 5 km.	No	No
<i>Aphelocephala leucopsis</i>	Southern Whiteface	V	Occurs across most of Mainland Australia south of the tropics, from the north eastern edge of the Western Australian wheatbelt, east to the Great Dividing Range.	Relatively undisturbed open woodlands and shrublands with an understory of grasses or shrubs. Prefers habitats with low tree densities with an herbaceous understory litter cover. Living and dead trees with hollows and crevices are essential for rooting and nesting.	0	Unlikely – no records of species within 5 km.	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
<i>Aprasia parapulchella</i>	Pink-tailed Worm-lizard, Pink-tailed Legless Lizard	V	Primarily known from the Central and Southern Tablelands and the South Western Slopes, with a confirmed outlier record on the Hay Plains north of Hay. There is a concentration of populations in the Canberra/Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West Wyalong. This species is also found in the Australian Capital Territory.	Inhabits sloping, open woodland areas with predominantly native grassy ground layers, particularly those dominated by <i>Themeda australis</i> (kangaroo grass). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.	0	No - There are no karsts, caves, crevices, cliffs, rocks or other geological features in the subject land	No	No
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	Found over most of NSW except for the far north-west.	Permanent freshwater wetlands with tall, dense vegetation, particularly <i>Typha</i> spp. (bullrushes) and <i>Eleocharis</i> spp. (spikerushes).	1	Unlikely – no wetland nearby and only minimal records of species within 5 km.	No	No
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	V, M	Summer migrant. Widespread in most	Shallow fresh or brackish wetlands, with	1	No – one record of species within 5 km and	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
			regions of NSW, especially in coastal areas, but sparse in the south-central Western Plain and east Lower Western Regions.	inundated or emergent sedges, grass, saltmarsh or other low vegetation.		unsuitable habitat (no wetland)		
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE, M	Occurs along the entire coast of NSW, and sometimes in freshwater wetlands in the Murray-Darling Basin.	Littoral and estuarine habitats, including intertidal mudflats, non-tidal swamps, lakes and lagoons on the coast and sometimes inland.	1	No – one record of species within 5 km and unsuitable habitat (no estuarine habitat)	No	No
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	E	Distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour	In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. Favours old growth forest and woodland attributes for	0	Unlikely – marginal habitat present (PCT 3320 with <i>Eucalyptus tereticornis</i>), but no records of species within 5 km.	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
			and as far west as Mudgee.	nesting and roosting. Nests are located in hollows that are 7 cm in diameter or larger in eucalypts and 3 metres or more above the ground.				
<i>Calyptorhynchus lathamii lathamii</i>	Glossy Black-Cockatoo, Riverina population	V	Within the Narrandera Range and to the north-west in the Brobenah Hills, McPhersons Range, Cocoparra Range, Lachlan Range and Jimberoo State Forests, and the Naradhan Range.	Largely restricted to hills and low ridges where suitable stands of its food plant <i>Allocasuarina verticillata</i> (Drooping Sheoak) remain.	1	No – records of species within 5 km, but unsuitable habitat (no <i>Allocasuarina</i> or <i>Casuarina</i> and no large hollows)	No	No
<i>Chalinolobus dwyeri</i>	Large-eared Bat	Pied V	Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes.	Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	8	Unlikely – habitat marginal (woodland), only minimal records of species within 5 km.	No	No
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (south-eastern subspecies)	V	endemic to south-eastern Australia from the Grampians in western Victoria, through central NSW to the Bunya	Fry open eucalypt forests and woodlands	0	Unlikely – marginal habitat present (PCT 3320), but no records of species within 5 km.	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
			Mountains in Queensland.					
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll (southeastern mainland population)	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld.	Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	0	Unlikely – habitat marginal (woodland), and no records of species within 5 km	No	No
<i>Erythrotriorchis radiatus</i>	Red Goshawk	E	In NSW, extends to ~30°S. Recent records confined to the Northern Rivers region north of the Clarence Rivers.	Open woodland and forest, often along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and coastal riparian Eucalyptus forest.	0	Unlikely – habitat marginal (woodland/watercourse), and no records of species within 5 km	No	No
<i>Falco hypoleucos</i>	Grey Falcon	E	Arid and semi-arid zones. In NSW, found chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range.	Shrubland, grassland and wooded watercourses, occasionally in open woodlands near the coast, and near wetlands.	0	Unlikely – habitat marginal (woodland/watercourse), and no records of species within 5 km	No	No
<i>Gallinago hardwickii</i>	Latham's Snipe	V, M	Migrant to east coast of Australia, extending inland west of the Great Dividing Range in NSW.	Freshwater, saline or brackish wetlands up to 2000 m above sea-level; usually freshwater swamps, flooded	0	No – no records of species within 5 km and unsuitable habitat (no wetland)	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
				grasslands or heathlands.				
<i>Grantiella picta</i>	Painted Honeyeater	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas.	Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	0	Unlikely – habitat marginal (box-gum woodland), but no records of species within 5 km	No	No
<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	South eastern NSW and Victoria, in two distinct populations: a northern population in the sandstone geology of the Sydney Basin as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria.	Heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based.	0	Unlikely – habitat marginal (woodland on clay/loam soil), but no records of species within 5 km	No	No
<i>Hirundapus caudacutus</i>	White-throated Needletail	M	All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide.	Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	5	Unlikely – habitat marginal (remnant woodland), and minimal records of species within 5 km	No	No
<i>Lathamus discolor</i>	Swift parrot	CE	Migrates from Tasmania to mainland in Autumn-Winter. In NSW, the species mostly occurs on the coast and south west slopes.	Box-ironbark forests and woodlands.	14	Potential – habitat is marginal (woodland) and BioNet records within 5 km	Yes	Yes

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
<i>Litoria aurea</i>	Green and Golden Bell Frog	V	Since 1990, recorded from ~50 scattered sites within its former range in NSW, from the north coast near Brunswick Heads, south along the coast to Victoria. Records exist west to Bathurst, Tumut and the ACT region.	Marshes, dams and stream-sides, particularly those containing Typha spp. (bullrushes) or Eleocharis spp. (spikerushes). Some populations occur in highly disturbed areas.	0	No – no records of species within 5 km, and unsuitable habitat (no marshes or dams)	No	No
<i>Macquaria australasica</i>	Macquarie Perch	E	In the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury/Nepean and Shoalhaven catchments.	Occur in waters with lots of cover such as aquatic vegetation, snags, boulders and overhanging banks	0	No – no records of species within 5 km, and unsuitable habitat (no waterbodies or dams)	No	No
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (south-eastern form)	E	Found throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies <i>picata</i> .	Open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas.	0	Unlikely – habitat marginal (woodland), and no records of species within 5 km	No	No
<i>Neophema chrysostoma</i>	Blue-winged Parrot	V	A non-breeding migrant to NSW. It occurs in NSW from autumn to early spring.	Inhabits a range of habitats from coastal, sub-coastal and inland areas. Favours	0	Unlikely – habitat marginal, and no records of species within 5 km	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
				grasslands and grassy woodlands found near wetlands near the coast or in semi-arid zones. Can also be found in altered environments including airfields, golf-courses and paddocks.				
<i>Petauroides volans</i>	Greater Glider (southern and central)	E	The Southern Greater Glider occurs in eastern Australia, in eucalypt forests and woodlands, where it has a broad distribution from around Proserpine in Queensland, south through NSW and the Australian Capital Territory into Victoria.	Eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows.	0	No – marginal habitat (eucalypt woodland), but no records of species within 5 km.	No	No
<i>Petaurus australis</i>	Yellow-bellied Glider (south-eastern)	V	Widespread but patchy distribution from south-eastern Queensland (Qld) to far south-eastern SA, near the SA-Vic border. In NSW, it predominantly occurs in forests along the eastern coast, from the NSW-Qld border to the NSW-Vic border	Occurs in eucalypt-dominated woodlands and forests, including both wet and dry sclerophyll forests.	1	Unlikely – marginal habitat (eucalypt-dominated woodland), but minimal records of species within 5 km	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	V	In NSW they occur from the Qld border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit.	Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	0	No – no records of species within 5 km and unsuitable habitat (no rocky escarpments)	No	No
<i>Phascolarctos cinereus</i>	Koala	E	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct populations in the Bega District, and at several sites on the southern tablelands.	Eucalypt woodlands and forests.	1	Unlikely – habitat marginal (eucalypt woodland), and one record of species within 5 km	No	No
<i>Prototroctes maraena</i>	Australian Grayling	V	The Australian Grayling is endemic to south-eastern Australia, including Victoria, Tasmania and New South Wales. Rare fish are likely in South Australia. It was once abundant throughout its range but has declined in many areas since European settlement and is now generally patchily	Larvae migrate out to sea for the first 4 – 6 months before migrating back to freshwater. In their freshwater phase they are found in moderate to fast flowing waters, such as glides or runs, during the day and slow-flowing waters at night.	0	No – no records of species within 5 km, and unsuitable habitat (no waterbodies or dams)	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
			distributed. In NSW its most northern limit is now the Clyde River.					
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	V	Fragmented distribution across eastern NSW.	Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	0	No – no records of species within 5 km and unsuitable habitat (no heathland understorey)	No	No
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria.	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	241	Potential – habitat is marginal (foraging habitat in PCT 3320, but no camps) and species known to occur within 5 km	Yes	Yes
<i>Pycnoptilus floccosus</i>	Pilotbird	V	Endemic to south-east Australia. Upland Pilotbirds occur above 600 m in the Brindabella Ranges in the Australian Capital Territory, and in the Snowy Mountains in New South Wales and north-east Victoria. Lowland Pilotbirds occur in forests from the Blue Mountains west of Newcastle, around the wetter forests of eastern	Wet sclerophyll forests in temperate zones in moist gullies with dense undergrowth, and dry sclerophyll forests and woodlands occupying dry slopes and ridges.	0	Unlikely – habitat marginal (woodlands), but no records of species within 5 km	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
			Australia, to Dandenong near Melbourne					
<i>Rostratula australis</i>	Australian Painted Snipe	E	In NSW most records are from the Murray-Darling Basin. Other recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys.	Swamps, dams and nearby marshy areas.	0	No – no records of species within 5 km and unsuitable habitat (no swamps or dams)	No	No
<i>Stagonopleura guttata</i>	Diamond Firetail	V	Endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina.	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Woodlands, and open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities, often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.	1	Unlikely – marginal habitat present (PCT 3320), and a single record of species within 5 km.	No	No
<i>Tringa nebularia</i>	Common Greenshank	E, M	Summer migrant to Australia. Recorded in most coastal regions of NSW; also widespread west of the Great Dividing Range, especially	Terrestrial wetlands (swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans,	0	No – no records of species within 5 km and unsuitable habitat (no wetlands)	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
			between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions.	saltflats, sewage farms and saltworks dams, inundated rice crops and bores) and sheltered coastal habitats (mudflats, saltmarsh, mangroves, embayments, harbours, river estuaries, deltas, lagoons, tidal pools, rock-flats and rock platforms).				

M = MIGRATORY, V= VULNERABLE; E= ENDANGERED, CE = CRITICALLY ENDANGERED.

Table 51: Likelihood of occurrence of threatened flora listed under the EPBC Act.

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
<i>Acacia bynoeana</i>	Bynoe's Wattle	V	Found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains.	Heath or dry sclerophyll forest on sandy soils.	0	No – unsuitable habitat	No	No
<i>Acacia pubescens</i>	Downy Wattle	V	Restricted to the Sydney region around the Bankstown-Fairfield-Rookwood and Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon.	Open woodland and forest, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland. Occurs on alluviums, shales and at the intergrade between shales and sandstones.	1	No – habitat marginal (Cumberland Plain Woodland), but minimal records of species within 5 km and outside geographic range	No	No
<i>Allocasuarina glareicola</i>		E	Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier population found at Voyager Point, Liverpool.	Castlereagh woodland on lateritic soil. Found in open woodland with <i>Eucalyptus parramattensis</i> , <i>Eucalyptus fibrosa</i> , <i>Angophora bakeri</i> , <i>Eucalyptus sclerophylla</i> and <i>Melaleuca decora</i> .	1	No – records of species within 5 km, but unsuitable habitat (no Castlereagh woodland)	No	No
<i>Cynanchum elegans</i>	White-flowered Wax Plant	E	Restricted to eastern NSW, from Brunswick Heads on the north coast to Gerroa in	Dry rainforest; littoral rainforest; <i>Leptospermum laevigatum</i> - <i>Banksia</i>	0	Unlikely – habitat marginal	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
			the Illawarra region, and as far west as Merriwa in the upper Hunter River valley.	<i>integrifolia</i> subsp. <i>integrifolia</i> (Coastal Tea-tree– Coastal Banksia) coastal scrub; <i>Eucalyptus tereticornis</i> (Forest Red Gum) or <i>Corymbia maculata</i> (Spotted Gum) open forest and woodland; and <i>Melaleuca armillaris</i> (Bracelet Honeymyrtle) scrub.		(woodland with <i>E. tereticornis</i>), but no records of species within 5 km		
<i>Eucalyptus benthamii</i>	Camden White Gum, Nepean River Gum	CE	Alluvial flats of the Nepean River and its tributaries. Mainly Kedumba Valley of the Blue Mountains National Park and Bents Basin State Recreation Area. Also along the Nepean River around Camden and Cobbitty, at Werriberri (Monkey) Creek in The Oaks, and on the Nattai River in Nattai National Park.	Occurs in open forest. Requires a combination of deep alluvial sands and a flooding regime.	0	No – no records of species within 5 km and unsuitable habitat (no deep sands and flooding regime)	No	No
<i>Genoplesium baueri</i>	Bauer's Orchid	Midge E	Has been recorded from locations between Nowra and Pittwater and may occur as far north as Port Stephens.	Dry sclerophyll forest and moss gardens over sandstone.	0	No – no records of species within 5 km and unsuitable habitat (no sandstone)	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
<i>Haloragis exalata</i> subsp. <i>exalata</i>	Square Raspwort	V	Disjunct distribution in the Central Coast, South Coast and North Western Slopes botanical subdivisions of NSW.	Protected and shaded damp situations in riparian habitats.	0	No – no records of species within 5 km and unsuitable habitat (no riparian habitat)	No	No
<i>Melaleuca deanei</i>	Deane's Paperbark	V	Ku-ring-gai/Berowra area, Holsworthy/Wedderburn area, Springwood (in the Blue Mountains), Wollemi National Park, Yalwal (west of Nowra) and Central Coast (Hawkesbury River) areas.	Heath on sandstone.	0	No – no records of species within 5 km and unsuitable habitat (no sandstone)	No	No
<i>Micromyrtus blakelyi</i>		V	Restricted to areas near the Hawkesbury River, north of Sydney. Distribution extends from north of Maroota in the north, to Cowan in the south.	Heathlands in shallow sandy soil, on sandstone rock platforms.	0	No – no records of species within 5 km and unsuitable habitat (no heathland)	No	No
<i>Micromyrtus minutiflora</i>		V	Restricted to the general area between Richmond and Penrith, western Sydney.	Castlereagh Scribbly Gum Woodland, Ironbark Forest, Shale/Gravel Transition Forest, open forest on tertiary alluvium and consolidated river sediments.	0	No – records of species within 5 km, but unsuitable habitat (no alluvium or river sediment)	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
<i>Persicaria elatior</i>	Tall Knotweed	V	In south-eastern NSW recorded from Mt Dromedary, Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests).	Beside streams and lakes, swamp forest or disturbed areas.	0	No – records of species within 5 km, but unsuitable habitat (no stream/lakes – only the concreted creek)	No	No
<i>Persoonia nutans</i>	Nodding Geebung	E	Restricted to the Cumberland Plain in western Sydney, between Richmond in the north and Macquarie Fields in the south.	Northern populations: sclerophyll forest and woodland (Agnes Banks Woodland, Castlereagh Scribbly Gum Woodland and Cooks River / Castlereagh Ironbark Forest) on aeolian and alluvial sediments. Southern populations: tertiary alluvium, shale sandstone transition communities and Cooks River / Castlereagh Ironbark Forest.	1	Unlikely – marginal habitat (woodland), but minimal records of species within 5 km	No	No
<i>Pimelea curviflora</i> var. <i>curviflora</i>		V	Confined to the coastal area of the Sydney and Illawarra	Woodland, mostly on shaley/lateritic soils over	0	Unlikely – habitat	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
			regions between northern Sydney and Maroota in the north-west and Croom Reserve near Albion Park in the south.	sandstone and shale/sandstone transition soils on ridgetops and upper slopes.		marginal (woodland on shale), but no records of species within 5 km		
<i>Pimelea spicata</i>	Spiked flower	Rice- E	Two disjunct areas; the Cumberland Plain (Marayong and Prospect Reservoir south to Narellan and Douglas Park) and the Illawarra (Landsdowne to Shellharbour to northern Kiama).	Well-structured clay soils. <i>Eucalyptus moluccana</i> (Grey Box) communities and in areas of ironbark on the Cumberland Plain. Coast Banksia open woodland or coastal grassland in the Illawarra.	64	Potential – habitat is marginal (clay soils and Cumberland Plains Woodland) and species known to occur within 5 km	No	No
<i>Pomaderris brunnea</i>	Brown Pomaderris	V	In NSW, found around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. It also occurs near Walcha on the New England tablelands.	Moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	0	No – no records of species within 5 km and unsuitable habitat (no moist woodland)	No	No
<i>Pterostylis saxicola</i>	Sydney Plains Greenhood	E	Restricted to western Sydney between Freemans Reach in the north and Picton in the south.	Small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines, adjacent to sclerophyll forest or woodland on shale/sandstone	0	No – no records of species within 5 km and unsuitable habitat (no sandstone rock shelves)	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
				transition soils or shale soils.				
<i>Pultenaea parviflora</i>		V	Endemic to the Cumberland Plain. Mainly from Windsor to Penrith and east to Dean Park, with outlier populations at Kemps Creek and Wilberforce.	Dry sclerophyll forest, especially Castlereagh Ironbark Forest, Shale Gravel Transition Forest and transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland.	19	Unlikely – habitat marginal (PCT 3320), but minimal records of species within 5 km	No	No
<i>Rhizanthella slateri</i>	Eastern Australian Underground Orchid	E	In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra.	Sclerophyll forest in shallow to deep loams.	0	No – habitat marginal (PCT 3320), but no records of species within 5 km and outside geographic range	No	No
<i>Rhodamnia rubescens</i>	Scrub Turpentine, Brown Malletwood	CE	Occurs in coastal districts north from Batemans Bay in New South Wales (NSW), approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland.	Subtropical Rainforests, Northern Warm Temperate Rainforests, Littoral Rainforest, North Coast Wet Sclerophyll Forests, Northern Hinterland WSF, Northern Escarpment WSF, Southern Lowland WSF, and probably the northern patches of South	0	No – no records of species within 5 km and unsuitable habitat (no rainforest or wet sclerophyll vegetation)	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution	Habitat	Number of records within 5km	Likelihood of occurrence on site	Habitat on the site directly or indirectly impacted	Impact assessment required
				Coast WSF and Southern Escarpment WSF				
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	V	Only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest.	Subtropical and littoral rainforest on gravels, sands, silts and clays.	1	No – records of species within 5 km, but unsuitable habitat (no rainforest vegetation)	No	No
<i>Thesium australe</i>	Austral Toadflax	V	In eastern NSW it is found in very small populations scattered along the coast, and from the Northern to Southern Tablelands.	Grassland on coastal headlands or grassland and grassy woodland away from the coast.	0	Unlikely – habitat marginal (grassy woodland), but no records of species within 5 km	No	No

M = MIGRATORY, V= VULNERABLE; E= ENDANGERED, CE = CRITICALLY ENDANGERED.

Appendix F : Biodiversity credit report



BAM Credit Summary Report

Proposal Details

Assessment Id 00055099/BAAS18159/25/00055100	Proposal Name Caddens SSD small areas	BAM data last updated ^ 05/08/2025
Assessor Name Belinda Jane Failes	Report Created 25/08/2025	BAM Data version ^ Current classification (live - default) (82)
Assessor Number BAAS18159	BAM Case Status Finalised	Date Finalised 25/08/2025
Assessment Revision 0	BOS entry trigger	Assessment Type Major Projects

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
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Caddens SSD small areas

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BAM Credit Summary Report

Cumberland Shale Plains Woodland												
1	3320_mown	Cumberland Plain Woodland in the Sydney Basin Bioregion	57.1	57.1	0.02	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	1
											Subtotal	1
											Total	1

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAIL	Species credits	
Lathamus discolor / Swift Parrot (Fauna)										
3320_mown		57.1	57.1	0.02	Environment Protection and Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Critically Endangered	True	1
									Subtotal	1

Assessment Id
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Proposal Name
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