



Kellyville Station Precinct

Biodiversity Development Assessment Report

Final Report

Prepared for Landcom

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Biosis acknowledges the Aboriginal and Torres Strait Islander peoples as Traditional Custodians of the land on which we live and work.

We pay our respects to the Traditional Custodians and Elders past and present and honour their connection to Country and ongoing contribution to society.

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Definitions

Term	Definition
Assessment Area	All land within 1500 m of a site based development
BAM	NSW Biodiversity Assessment Method 2020
BAM-C	BAM Calculator
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	NSW <i>Biosecurity Act 2015</i>
BMP	Biodiversity Management Plan
BOS	Biodiversity Offsets Scheme
BV Map	NSW Biodiversity Values Map and Threshold Tool (NSW DCCEEW 2025a)
CEEC	Critically Endangered Ecological Community
CEMP	Construction Environmental Management Plan
CoC	Conditions of Consent
DA	Development Application
Cth DCCEEW	Australian Commonwealth Department of Climate Change, Energy, the Environment and Water
DBH	Diameter at Breast Height
Development footprint	The area of land that is directly impacted by the proposal
DoIW	Directory of Important Wetlands
DP	Deposited Plan
DPI	NSW Department of Primary Industries
DTDB	Digital topographic databases
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 development
Ecosystem credit species	Threatened species whose occurrence can generally be predicted by vegetation surrogates and/or landscape features, or that have a low probability of detection using targeted surveys. A targeted survey is not required to identify or confirm the presence of ecosystem credit species.
EEC	Endangered Ecological Community
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>
GDE	Groundwater Dependent Ecosystem
GIS	Geographic Information System
IBRA	Interim Biogeographic Regionalisation of Australia

Term	Definition
LEP	Local Environmental Plan
LGA	Local Government Area
Locality	Area located within 10 km radius from the subject land
MNES	Matters of National Environmental Significance protected by a provision of Part 3 of the EPBC Act
NPW Act	NSW <i>National Parks and Wildlife Act 1974</i>
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
PCT	Plant Community Type
SAII	Serious and Irreversible Impact
SEARs	Secretary's Environmental Assessment Requirements
SEPP	NSW State Environmental Planning Policy
SIS	Species Impact Statement
Species credits	A class of biodiversity credits required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates
Species credit species	Threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence or components of their habitat. A targeted survey or an expert report is required to confirm the presence of these species on the subject land. Alternatively, the proponent may elect to assume the species is present for development/clearing projects only.
SSD	State Significant Development
Subject land	The areas within, or the combined areas of, the development footprint, and any indirect and prescribed impacts.
TEC	Threatened Ecological Community
TBDC	Threatened Biodiversity Data Collection
WM Act	NSW <i>Water Management Act 2000</i>
WHS	Work Health and Safety

Summary

Landcom proposes to undertake the Stage 2 development of the Kellyville Station Precinct (Kellyville SP), located at Kellyville in New South Wales (NSW) (Figure 1). The proposed works will proceed in accordance with the *Kellyville Stage 2 Superlots D,E,F and Open Space Development Plan* (Santec 2026) and include the following:

- Construction of new roads, and associated stormwater, earthworks, and civil works.
- Provision of wastewater, potable water, recycled water infrastructure.
- Provision of electrical services network and reticulation infrastructure.
- Provision of data and telecommunications network infrastructure.
- Streetscape landscape works.

To achieve the outcomes outlined above, installation of drainage and stormwater infrastructure (including temporary stormwater basins), stockpiling of excess soil, installation of temporary and permanent site fencing, provision of service authority utilities within the road corridors, geotechnical investigations, road works and site clearance (including the removal of native vegetation) will be required within the subject land.

The Kellyville SP is a State Significant Development (SSD) Concept Approval that was granted in December 2022 (SSD 10343), subject to the Concept Plan Biodiversity Development Assessment report (BDAR) (Eco Logical Australia 2020a); however, the current Stage 2 development is considered a local development and will be assessed under Part 4 of the *NSW Environmental Planning and Assessment Act 1979* (EP&A Act). Condition 31 of the Concept Approval also requires that future detailed development applications are to be subject to separate/updated biodiversity assessment and include a BDAR, if required.

The proposed works will exceed the relevant native vegetation clearing threshold and result in impacts to vegetation that is designated within the Biodiversity Values Map (NSW DCCEEW 2025a) and as such, the removal of vegetation triggers the Biodiversity Offsets Scheme (BOS) and an assessment is required in accordance with the *NSW Biodiversity Assessment Method* (BAM) (DPIE 2020a) and the *Biodiversity Conservation Act 2016* (BC Act). This BDAR has been prepared by Kaisha Edwards and Callan Wharfe, an Accredited Assessor (BAAS18138), to accompany the Development Application (DA). This BDAR describes the outcome of the development assessment case (00062119/BAAS18138/25/00062120) conducted consistent with the BAM.

Field investigation, undertaken in accordance with the BAM, recorded 9.12 hectares of native vegetation within the broader subject land, comprising three Plant Community Types (PCTs). The native vegetation was found to represent five threatened ecological communities (TECs), including:

- 5.64 ha of vegetation representing the *Cumberland Plain Woodland in the Sydney Basin Bioregion* Critically Endangered Ecological Community (CEEC) listed under the BC Act, and 2.07 ha of the *Cumberland Plain Shales Woodland in the Sydney Basin Bioregion* CEEC, listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- 0.15 ha of vegetation representing the *Sydney Freshwater Wetlands in the Sydney Basin Bioregion* Endangered Ecological Community (EEC) listed under the BC Act.
- 3.33 ha of vegetation representing the *River-flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* EEC listed under the BC Act, and the *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria* EEC listed under the EPBC Act.

The proposed works will result in direct impacts to 5.41 hectares of native vegetation, including:

- 4.18 hectares of PCT 3320, including 1.95 hectares in a moderate condition, 0.27 in a low condition and 1.96 hectares in a Landscape Planting condition, all of which is consistent with the BC Act listed Cumberland Plain Woodland CEEC and 1.95 hectares is consistent with the EPBC Act listed Cumberland Plain Woodland and Shale Gravel Transitions Forest CEEC.
- 0.04 hectares of PCT 3975 in a moderate condition, which is consistent with the BC Act listed Freshwater Wetlands EEC.
- 1.19 hectares of PCT 4025, including 0.77 hectares in a moderate condition and 0.42 hectares in a revegetated condition, all of which is consistent with the River-flat Eucalypt Forest BC Act listed EEC and EPBC Act listed CEEC.
- 5.14 hectares of habitat for Southern Myotis *Myotis macropus* (Vulnerable, BC Act).

These impacts will equate to the removal of 3.6 % of the native vegetation within the assessment area (1,500 metre buffer zone in accordance with the BAM).

The vegetation integrity (VI) score of all vegetation zones was calculated and is presented in the table below. In accordance with Section 10 of the BAM, offsets are required to be secured for the proposed development. The offset requirement for ecosystem credits and species credits for the proposal was calculated using the BAM Calculator and are outlined in the tables below.

Table 1 Summary of offsets required (ecosystem credits)

Vegetation zone	Area (ha)	VI score	Offset required	TEC	Credit requirement
3320_Landscape Plantings	1.96	12.4	No	Yes	0
3320_Low	0.27	26.5	Yes	Yes	4
3320_Moderate	1.95	68.4	Yes	Yes	83
3975_Moderate	0.04	18.4	Yes	Yes	1
4025_Revegetated	0.42	54.4	Yes	Yes	11
4025_Moderate	0.77	69.9	Yes	Yes	27
TOTAL					126

It should be noted that the project's ecosystem credit offset requirement has reduced from 133 credits to 126 credits with design revisions undertaken to address Council's recent feedback.

Table 2 Summary of offsets required (species credits)

Vegetation zone	Species	Habitat condition (vegetation integrity score) loss	Area (ha)	Biodiversity risk weighting	Credit requirement
3320_Low	Southern Myotis	26.5	0.27	2	4
3320_Moderate	Southern Myotis	68.4	1.95	2	67

Vegetation zone	Species	Habitat condition (vegetation integrity score) loss	Area (ha)	Biodiversity risk weighting	Credit requirement
3320_Landscape plantings	Southern Myotis	12.4	1.69	2	10
3975_Moderate	Southern Myotis	18.4	0.04	2	1
4025_Revegetated	Southern Myotis	54.4	0.42	2	11
4025_Moderate	Southern Myotis	69.9	0.77	2	27
TOTAL					120

The project's offset requirement for Southern Myotis has reduced from 126 credits to 120 credits with design revisions undertaken to address Council's recent feedback.

Indirect impacts predicted to occur as a result of the proposal will be minimised through the mitigation measures provided in Section 7 of this BDAR, including the implementation of a Construction Environmental Management Plan (CEMP) and Biodiversity Management Plan (BMP).

It is acknowledged that minor increases to impacts will occur as a result from the project, over and above those included in the Concept Plan BDAR. These impacts are required as a result of further and more detailed design work to deliver the Concept Approval for the Kellyville SP. However, commitment of Landcom during the detailed design phase to achieve avoid, minimise and mitigation was demonstrated through collaborative design team meetings involving Biosis, Landcom, Santec, Land and Form, CPS, Ethos Urban and other technical consultants to identify and resolve potential impacts to biodiversity values and workshop appropriate solutions, considering advice from all parties.

Avoidance of high biodiversity values, including native vegetation, TECs and threatened species habitat were undertaken where possible throughout the development of the Concept Plan for the Kellyville SP. However, the location and layout of the initial site design was determined by the Concept Plan for the Kellyville SP, which was developed through strategic assessment and in accordance with the NSW Government's housing and employment targets for the area. High biodiversity values within the riparian corridor, including areas of mapped Cumberland Plain Woodland CEEC listed under the BC Act and EPBC Act, were proposed to be retained where possible in planned open space areas, and the majority of the development was to be positioned in cleared and exotic vegetation areas within the subject land.

Following submission of the initial DA, and subsequent feedback from Council around the need to further explore options to avoid and minimise impact to biodiversity values, the proponent has undertaken further efforts to reduce the level of increased impacts between the Concept Plan BDAR and the current assessment. This included multiple project team design workshops to interrogate areas of increased impacts and opportunities to reduce those impacts. The outcome of these workshops ultimately led to the redesign of elements of the design to prioritise avoidance and minimisation of impacts to biodiversity values by relocation of the shared pathway that runs along the riparian corridor to the west, and the substitution of sloped batters for retaining walls to minimise direct impacts along the eastern and southern site boundaries. Mitigation and management measures will be put in place to adequately address impacts associated with the proposal, both direct, indirect and prescribed.

Design refinements completed post DA submission to address Council feedback has resulted in a reduction in impacts to BC Act and EPBC Act listed River-flat Eucalypt Forest EEC from 1.4 hectares to 1.19 hectares (approximately a 15 % reduction in impacts), and an associated reduction in confirmed Southern Myotis habitat from 5.22 hectares to 5.14 hectares. The overall reduction in impacts to native vegetation equates to 0.1 hectares (rather than the 0.21 hectares of River-flat Eucalypt Forest EEC noted above), due to a small misalignment in the previous BDAR's development footprint and the relevant civil drawings, increasing impacts to planted Cumberland Plain Woodland CEEC (BC Act only) by 0.11 hectares. It should be noted that this planted Cumberland Plain Woodland is of such low ecological condition that it does not trigger offsets under the BC Act or EPBC Act.

The efforts to further avoid and minimise increased impacts to biodiversity values between those assessed in the Concept Plan BDAR and the current project footprint have exhausted available opportunities to do so, whilst maintaining the project's key housing delivery objectives. As such, residual impacts are considered unavoidable and the BC Act Avoid, Minimise and Offset hierarchy has been implemented to the fullest extent possible for the design and approvals phase of the project.

An assessment against Serious and Irreversible Impacts (SAIL) has been prepared for Cumberland Plain Woodland (Appendix 5), in accordance with the BAM and *Guidance to assist a decision-maker to determine a serious and irreversible impact* (DPIE 2019).

Based on the assessment in Appendix 5, with reference to the SAIL principles, the project will not have a significant or substantial impact upon the geographic extent of the CEEC, given impacts will occur to approximately 0.02% of the community (4.07 ha of the 22,774 ha estimated extent). Nor will the project contribute in a material way to further environmental degradation or the disruption of biotic processes, given the already highly fragmented condition the CEEC that occurs in within 500 m of the development footprint and other negative pressures already acting on the CEEC in the locality, and more broadly.

A referral of the proposed action (the project) to the Australian Government Minister for the Environment and Energy was undertaken for the concept plan approval (EPBC Act referral 2020/8828). Approval for Kellyville SP Concept Plan was granted with controlling provisions on 31 October 2021 and remains in effect until 01 January 2041. The proposed development must comply with Conditions of Approval (CoA) 1-22, which include an upper limit clearing threshold, and an associated offset requirement. It should be noted that the project will now result in minor increases in clearing above the approved limits, and updates to the EPBC Act approval will be sought.

Elizabeth Macarthur Creek occupies the eastern boundary of the development site, with the development footprint within the 20 metre riparian set back in some locations and is classified as a second order stream, under the *Water Management Act 2000* (WM Act). Removal of riparian vegetation is proposed within 40 metres of the waterway.

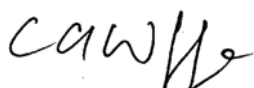
Certification and declarations

I certify that this report has been prepared based on the requirements of, and information provided under the Biodiversity Assessment Method (DPIE 2020a) and s6.15 of the *Biodiversity Conservation Act 2016*.

In preparing this assessment I have acted in accordance with the Accredited BAM Assessor Code of Conduct.

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest.

Signature:



Date:

04/05/2026

**BAM Assessor Accreditation
Number:**

BAAS18138

Stage 1 – Biodiversity assessment

1 Introduction

Biosis Pty Ltd was commissioned by Landcom to prepare a Biodiversity Development Assessment Report (BDAR) to support the proposed Stage 2 development of the Kellyville Station Precinct (Kellyville SP) at Kellyville in New South Wales (NSW), as part of the detailed design phase.

The purpose of this assessment was to apply the NSW BAM (DPIE 2020a) to the proposed development and provide Landcom with a BDAR. The BDAR is to be submitted to The Hills Shire Council (Council) as the approval authority for Kellyville (and associated Bella Vista) Station Precincts, under Part 4 (Section 4.37) of the EP&A Act.

As Landcom is a public authority, the DA is a Crown development application as prescribed by Section 4.32 of Division 4.6 of the EP&A Act.

1.1 Project description and background

The Kellyville SP is a State Significant Development (SSD) Concept Approval that was granted in December 2022 (SSD 10343). Situated within urban and residential development along the corridor of the NSW Government's Sydney Metro North West (SMNW) rail line, the Kellyville SP is one of eight station precincts along the urban corridor and covers approximately 18.8 hectares of land predominantly cleared of remnant vegetation. The Kellyville SP is defined by the Schedule 2 SSD Sites Map as per the State Environmental Planning Policy (Planning Systems) 2021 (Planning Systems SEPP). No building or construction works were proposed to be undertaken as part of the Concept Approval, with all future development subject to separate applications under the *Environmental Planning and Assessment Act 1979* (EP&A Act).

While an existing BDAR has been prepared for the Concept Approval *Kellyville Precinct - Biodiversity Development Assessment Report*, The Hills Shire Council (Council) also require a BDAR for local development applications during the detailed design phase. The Kellyville SP detailed design is comprised of the following stages:

- Stage 1: Lot C.
- Stage 2: Lot D, E, and F, inclusive of roads and streetscaping (current assessment).
- Stage 3: Open Space Areas KV2, KV3, KV4, KV5 and Riparian Corridors of Elizabeth Macarthur Creek.
- Stage 4: Future Bridges.

Stage 1 works were completed as part of the SMNW stations project and do not require further ecology assessment. Although Stages 2-4 are broadly consistent with the Concept Plan approval and were initially supported by an Ecology Assessment Report (Biosis 2024) which detailed consistency with existing approvals, Council did not support that pathway. Without this consistency, the proposed development triggers the NSW Biodiversity Offsets Scheme (BOS) and a BDAR is required.

Approval for the Kellyville SP Concept Plan was granted with controlling provisions by the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for potential impacts to Matters of National Environmental Significance (MNES) on 31 October 2021 and remains in effect until 01 January 2041 (EPBC Act referral 2020/8828). Referral of the project was undertaken on the basis of potential for significant impacts on *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* and

River-flat Eucalypt Forest on coastal floodplains. As such, the EPBC Act approval for the Concept Plan may also require modification as a result of the outcome of this BDAR.

This BDAR includes a resultant offset requirement in accordance with the BOS that varies from the existing Concept Approval requirements, due to changes in site condition and requirements of the BAM since the initial assessment was prepared in 2020.

1.1.1 Kellyville SP Stage 2 proposed works

Stage 2 does not include construction of built features (other than those described below), with detailed design of built features to be addressed by future DAs.

Proposed works include:

- Construction of new roads, and associated stormwater, earthworks, and civil works.
- Provision of wastewater, potable water, recycled water infrastructure.
- Provision of electrical services network and reticulation infrastructure.
- Provision of data and telecommunications network infrastructure.
- Streetscape landscape works.

In support of the above outcomes, Stage 2 will involve activities associated with construction, including:

- Site clearance (including removal of native vegetation).
- Drainage and stormwater infrastructure (including temporary stormwater basins). Stockpiling of excess soil.
- Installation of temporary and permanent site fencing.
- Provision of service authority utilities within the road corridors.
- Geotechnical investigations.
- Road works.

The project has been assessed as triggering the NSW BOS as the subject land is identified on the Biodiversity Values Map (BV Map) (NSW DCCEEW 2025a), and impacts to mapped biodiversity values will occur as a result of the project. Vegetation removal for the project will also exceed the clearing threshold of 0.25 hectares. The BC Act requires that the BAM (DPIE 2020a) be applied to all proposals that trigger the BOS, and that a BDAR is required to be submitted to the approval authority.

1.2 Purpose of this assessment

This BDAR will:

- Address the BAM (DPIE 2020a) and the BOS.
- Identify how the proponent has avoided and minimised impacts to biodiversity.
- Identify any potential impact that could be characterised as serious and irreversible.
 - Describe the offset obligations required to compensate for any unavoidable biodiversity impacts resulting from the proposed development.

- Consider and assess the proposal in accordance with other relevant legislation such as the Commonwealth EPBC Act.

All biodiversity assessments have been undertaken in accordance with the BAM, and this BDAR has been prepared by Kaisha Edwards and reviewed and Certified by Accredited Assessor Callan Wharfe (BAAS18138). This BDAR describes the outcome of the development assessment case (00062119/BAAS18138/25/00062120) conducted consistent with the BAM (DPIE 2020a).

1.3 The development footprint, subject land and assessment area

The terms subject land, development footprint and assessment area are used throughout this BDAR and are defined below:

- The development footprint is approximately 7.86 ha (following updates post-DA submission) and comprises all areas of direct impacts, servicing and bulk earthworks associated with Stage 2 of the detailed design, including all vegetation removal, construction and laydown areas (Figure 1).
- The subject land is approximately 18.78 ha and comprises the combined area of the development footprint and the SSDA boundary from the Concept Plan BDAR (Eco Logical Australia 2020a). It is defined as the entirety of Lot 1406 DP1249937 and Lot 167 DP1252052, as well as part of Lot 221 DP1121027, Lot 331 DP1155492, Lot 1408 DP1249937, Lot 1407 DP1249937, Lot 31 DP1136496, Lot 12 DP1184376, Lot 171 DP1252052, Lot 163 DP1252052 and parts of the associated road reserve (Figure 1).
- The assessment area includes the subject land and the area of land within the 1500 m buffer zone surrounding the subject land (Figure 3).

1.4 Sources of information

Sources of information used in the assessment included relevant databases, spatial data, literature and previous site reports.

In order to provide a context for the assessment area, records of flora and fauna from within 10 kilometres (the locality) were collated from the following databases and datasets were reviewed:

- Australian Commonwealth Department of Climate Change, Energy, the Environment and Water (Cth DCCEEW) Protected Matters Search Tool for matters protected by the EPBC Act.
- NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) BioNet - the database for the Atlas of NSW Wildlife, for species, populations and ecological communities listed under the BC Act.
- NSW BAM Calculator.
- Biodiversity values map (NSW DCCEEW 2025a).
- BAM Important Areas maps (NSW DCCEEW 2024a).
- PlantNET (The Royal Botanic Gardens and Domain Trust).
- BirdLife Australia, the New Atlas of Australian Birds.

Other sources of biodiversity information relevant to the assessment area were sourced from:

- The NSW PCTs, as held within the BioNet Vegetation Classification database (NSW DCCEEW 2025b).

- Relevant vegetation mapping, such as the NSW State Vegetation Type Map (SVTM C2.0M2.0) (NSW DCCEEW 2024b).

The following reports were also reviewed and relied on to provide additional information:

- Kellyville Precinct Biodiversity Development Assessment Report (Eco Logical Australia 2020a).
- Kellyville Precinct State Significant Development Application - Riparian Assessment (Eco Logical Australia 2020b)
- Kellyville Station Precinct SSD Application – Notice of Approval – EPBC 2020/8828 (DAWE 2020a).
- Kellyville Station Precinct Post Approvals Introduction Letter – EPBC 2022/8828 (DAWE 2020b).
- Kellyville Station Precinct SSD Application – Notice of Decision – SSD 10343 (DPE 2022b).
- Kellyville Station Precinct - Development Consent - SSD 10343 (DPE 2022c).
- Kellyville Station Precinct Concept Proposal - State Significant Development Application – SSD 10343 (DPE 2022d).
- Kellyville Station Precinct Urban Design Report (SJB Urban 2020a).
- Kellyville Station Precinct Urban Design Guidelines (SJB Urban 2020b).
- Kellyville and Bella Vista Station Precinct Landscape Master Plan and Open Space Strategy (Clouston Associates 2020).
- Design Excellence Strategy for the Kellyville and Bella Vista Station Precincts (Landcom 2020b).
- Kellyville Stage 2 Superlots D, E, F and Open Space. Development Plan 304001090-200-C6000 (Santec 2024)
- Kellyville Station Precinct: Stage 2 Superlots D, E, F and Open Space Ecology Assessment Report (Biosis 2024).

Basemap data was obtained from NSW Land and property information (LPI) 1:25,000 digital topographic databases, with cadastral data obtained from LPI digital cadastral database.

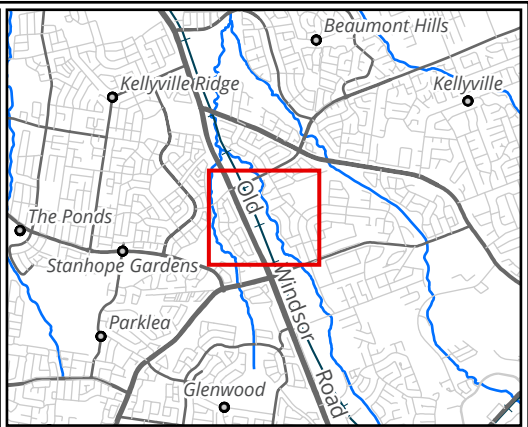
The following spatial datasets were utilised during the development of this report:

- Catchment Boundaries of New South Wales dataset.
- Mitchell Landscapes Version 3.0.
- Interim Biogeographic Regionalisation of Australia (IBRA) Version 7.
- Directory of Important Wetlands (DoIW).
- Spatial data associated with NSW State Vegetation Type Map (SVTM C2.0M2.0) (NSW DCCEEW 2024b).
- NSW Soil and Land Information System (SALIS).
- Mapping has been produced using a Geographic Information System (GIS). The following maps and data have been provided:
 - Digital mapping with aerial photography showing 1:1000 or finer.
 - Site map as described in subsection 3.1.1 of the BAM (DPIE 2020a).
 - Location map as described in subsection 3.1.2 of the BAM (DPIE 2020a).
 - Landscape map with features including 1,500 metre buffer, as described in section 3.1.3 of the BAM (DPIE 2020a).

1.5 Legislative requirements

The project has been assessed against relevant biodiversity legislation and government policy, including:

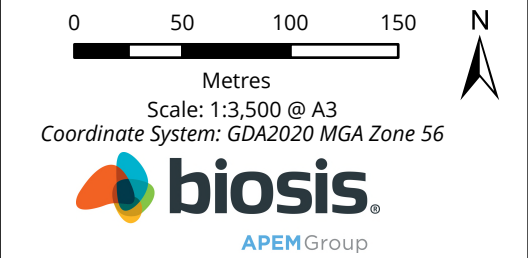
- *Environment Protection and Biodiversity Conservation Act 1999.*
- *Environmental Planning and Assessment Act 1979.*
- *Biodiversity Conservation Act 2016.*
- *Fisheries Management Act 1994.*
- *Biosecurity Act 2015.*
- State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP).
- *The Hills Development Control Plan 2021* (The Hills DCP).
- *The Hills Local Environmental Plan 2019* (The Hills LEP).



Legend

-  Subject land
-  Development footprint

Figure 1 Subject land



Matter: 40523, Date: 04 May 2026,
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyvilleSP_BDAR.aprx
Layout: 40523_F1_SubjectLand

2 Landscape context

This chapter describes the landscape and site context of the subject land, describing the landscape features present within the subject land (Figure 2) and within a 1500 metre buffer (Figure 3), as required by the BAM (DPIE 2020a).

2.1 Subject land description

The subject land is located generally to the east of the Kellyville Metro Station and approximately 4 kilometres northeast of the Westlink M7 Motorway between Glenwood and Beaumont Hills NSW, approximately 40 kilometres northwest of the Sydney Central Business District (CBD). Current land use is listed as a combination of RE1 Public Recreation, R1 Low Density Residential, R4 High Density Residential and E1 Local Centre under *The Hills Local Environmental Plan 2019* (The Hills LEP).

The subject land is approximately 18.8 hectares in size, with a contiguous patch of native vegetation along Elizabeth Macarthur Creek, as well as previously cleared exotic grassland, roads and other infrastructure associated with the Metro station, with planted and remnant native vegetation scattered throughout. Elizabeth Macarthur Creek is a second order perennial watercourse (Strahler 1964) that forms part of a large network of watercourses across The Hills and Blacktown Local Government Areas (LGA), eventually joining the Hawkesbury River over 15 kilometres to the northwest of the subject land.

2.1.1 Soil landscape

The subject land is within the Blacktown and South Creek soil landscapes of the Penrith 1:100,000 Sheet map and report (Bannerman & Hazelton 1990).

The majority of the subject land occurs within the Blacktown soil landscape, which is characterised by a topography of gently undulating rises on Wianamatta Shale, with local relief of 10–30 metres and slopes between 5 and 10%. It occurs extensively on the Cumberland Lowlands and is dominated by residential, agricultural and industrial land uses. Soils are shallow to moderately deep (>100 cm) hardsetting mottled texture contrast soils, consisting of Red and Brown Podzolic Soils on crests grading to Yellow Podzolic Soils on lower slopes and in drainage lines. The vegetation across this landscape has been extensively cleared, though was originally comprised of open forest and open woodland dominated by Forest Red Gum *Eucalyptus tereticornis*, Narrow-leaved Ironbark *Eucalyptus crebra*, Grey Box *Eucalyptus moluccana* and Spotted Gum *Eucalyptus maculata*.

The northern portion of the subject land occurs within the South Creek soil landscape, which comprises the floodplain of several drainage networks across the Cumberland Plain, including the South Creek, Eastern Creek, Ricabys Creek and Prospect Creek systems. The topography consists of flat to gently sloping alluvial plains, with occasional terraces or levees providing low relief. Soils are often very deep layered sediments over bedrock or relict soils. Where soil formation has occurred, Structured Plastic Clays or Structured Loams occur in and immediately adjacent to drainage lines, while Red and Yellow Podzolic Soils are most common on terraces with small areas of Structured Grey Clays, leached clays and Yellow Solodic Soils. Vegetation is dominated by Broad-leaved Apple *Angophora subvelutina*, Cabbage Gum *Eucalyptus amplifolia* and Swamp Oak *Casuarina glauca*. Much of the land across this landscape is for recreational use, including playing fields, parks and reserves, or is left unused.

2.1.2 NSW (Mitchell) Landscape

The subject land occurs within the Cumberland Plain Mitchell Landscape (DECC NSW 2002). This landscape is characterised by low rolling hills and valleys in a rain shadow area between the Blue Mountains and the coast. It occurs on horizontal Triassic shales and lithic sandstones forming a down-warped block on the coastal side of the Lapstone monocline, intruded by a small number of volcanic vents and partly covered by Tertiary River gravels and sands (Hawkesbury-Nepean Terrace Gravels landscape). The landscape includes Quaternary alluvium along the mains streams, a general elevation of 30 to 120 metres and a local relief 50 metres. Common vegetation communities found in this landscape are woodlands and open forest of Grey Box *Eucalyptus moluccana*, Forest Red Gum *Eucalyptus tereticornis*, Narrow-leaved Ironbark *Eucalyptus crebra*, Thin-leaved Stringybark *Eucalyptus eugenioides*, Cabbage Gum *Eucalyptus amplifolia* and Broad-leaved Apple *Angophora subvelutina*. Grassy to shrubby understorey often dominated by Australian Boxthorn *Bursaria spinosa*, poorly drained valley floors, often salt affected with Swamp Oak *Casuarina glauca* and Paperbark *Melaleuca* spp.

2.1.3 Native vegetation cover

Vegetation within the assessment area (within the 1500 metre buffer area) was assessed using aerial photographic interpretation, field survey results and existing vegetation mapping. Table 3 provides the list of PCTs identified from existing vegetation mapping, and the current assessment, as occurring within the assessment area. Conservation status of the communities is also provided.

The total area of the 1500 metre buffer around the subject land is 1055.71 hectares, with the area of native vegetation mapped within the buffer being 141.32 hectares (Figure 4). This is a native vegetation cover of 13.39% (>10–30% class as defined in Section 3.2.3 of the BAM (DPIE 2020a) and this value was entered into the BAM calculator.

Cleared areas within the assessment area include 914.39 hectares.

Table 3 PCTs within the assessment area

PCT name	Listing status	
	BC Act	EPBC Act
3250 Northern Foothills Blackbutt Grassy Forest	N/A	N/A
3320 Cumberland Shale Plains Woodland	<i>Cumberland Plain Woodland in the Sydney Basin Bioregion</i> (Critically Endangered)	<i>Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest</i> (Critically Endangered)
	<i>Shale Gravel Transition Forest in the Sydney Basin Bioregion</i> (Endangered)	
3321 Cumberland Shale-Sandstone Ironbark Forest	<i>Shale Sandstone Transition Forest in the Sydney Basin Bioregion</i> (Critically Endangered)	<i>Shale Sandstone Transition Forest of the Sydney Basin Bioregion</i> (Critically Endangered)

PCT name	Listing status	
	BC Act	EPBC Act
3975 Southern Lower Floodplain Freshwater Wetland	<i>Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> (Endangered)	N/A
4023 Coastal Valleys Riparian Forest	<i>Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> (Endangered)	<i>Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community</i> (Endangered)
4025 Cumberland Red Gum Riverflat Forest	<i>Elderslie Banksia Scrub Forest</i> (Critically Endangered)	<i>Elderslie Banksia Scrub Forest in the Sydney Basin Bioregion</i> (Critically Endangered)
	<i>River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> (Endangered)	<i>River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria</i> (Critically Endangered)
4058 Sydney Hinterland Red Gum Riverflat Forest	<i>River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> (Endangered)	<i>River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria</i> (Critically Endangered)

2.1.4 IBRA Bioregions and subregions

The assessment area occurs within the Sydney Basin IBRA bioregion and the Cumberland IBRA subregion. The Sydney Basin Bioregion lies on the central east coast of NSW and covers an area of approximately 3,624,008 hectares. It occupies about 4.53% of NSW and is one of two bioregions contained wholly within the state. The bioregion extends from just north of Batemans Bay to Nelson Bay on the central coast, and almost as far west as Mudgee. The bioregion is bordered to the north by the North Coast and Brigalow Belt South bioregions, to the south by the South East Corner Bioregion and to the west by the South Eastern Highlands and South Western Slopes bioregions. The Sydney Basin Bioregion is one of the most species diverse in Australia. This is a result of the variety of rock types, topography and climates in the bioregion (OEH 2016).

The Cumberland IBRA subregion covers an area of approximately 275,693 hectares, encompassing the Cumberland Plain, which is a broad shale basin between Sydney and the Blue Mountains. This subregion covers the Greater Western Sydney area, extending from north of Windsor to Picton in the south, and from

the Nepean-Hawkesbury River in the west to almost the Sydney CBD in the east. The Cumberland Plain is home to several threatened ecological communities and more than 100 threatened or migratory species.

2.1.5 Rivers and streams

The subject land is located within the Greater Sydney LLS Region and the Hawkesbury catchment area. The closest river-mouth is the Hawkesbury River, which is a Strahler Order nine watercourse located more than 15 kilometres to the northwest of the subject land. The closest major waterbody is Prospect Reservoir, located approximately 20 kilometres to the southwest.

The subject land is intersected by one watercourse, Elizabeth Macarthur Creek, which flows along the length of the eastern boundary of the subject land and joins with Caddies Creek (Strahler Order three watercourse) approximately 500 metres to the north. Remnant riparian vegetation occurs along the extent of the creek within the subject land; however, the condition of this vegetation and associated habitat varied across the length of the creek. Overhanging vegetation, undercut banks, coarse woody debris, snags and other substrates were present in sections of the creek, which have the potential to provide habitat for a variety of aquatic, semi-aquatic and terrestrial species, including frogs. However, habitat was also significantly degraded in sections.

An assessment of riparian and aquatic values of the creek was prepared by Eco Logical Australia (2020b) in support of Kellyville SP Concept Plan.

Twelve reaches within the creek were assessed by Eco Logical Australia (2020b) for riparian and aquatic habitat quality and found aquatic habitat to generally be poor, with limited areas of open water and numerous stormwater inputs likely to be transporting high nutrient runoff from adjoining residential areas. However, some reaches retain good quality aquatic habitat with some sections containing deep pools and riffles where the creek flowed over the roots of *Casuarina* species, associated with a drop in the grade of the creek bed. Small swamp areas containing standing water and dense rushland dominated by Broad-leaved Cumbungi *Typha orientalis* are also present. Providing habitat suitable for frogs and small fish. Numerous small open pools of varying depth also occur within reaches dominated by *Casuarina*.

Riparian habitat was in moderate to poor condition. Some reaches were dominated by remnant native vegetation supporting largely stable natural banks with intact canopy, mid and ground strata and limited dominance of weed species. While other reaches were highly disturbed, actively eroding and dominated by a range of invasive weeds (Eco Logical Australia 2020b).

Although there are no Key Fish Habitats (KFH) as mapped by the NSW Department of Primary Industries (DPI) within the subject land (DPI 2013), Elizabeth Macarthur Creek flows to a confluence with Caddies Creek approximately 500 metres north of the subject land, which is mapped as KFH.

2.1.6 Wetlands

No areas of the subject land or development footprint are mapped as a wetland in the Wetlands of NSW dataset (OEH 2010) or in the DoIW of Australia (Cth DCCEEW 2019), as shown on Figure 2 and Figure 3.

2.1.7 Hydrology

The site is not mapped as having Groundwater Vulnerability (LEP).

2.1.8 Geological features of significance

There were no recorded karst, caves, crevices, cliffs or other areas of geological significance within the subject land or within the assessment area. The closest area likely containing significant geological features is the Berowra Valley National Park, located approximately 10 kilometres east of the subject land.

2.1.9 Areas of outstanding biodiversity value

There are no areas of outstanding biodiversity value within the subject land (NSW DCCEEW 2024c).

2.1.10 Mapped Important Areas

Mapped Important Areas of habitat (NSW DCCEEW 2025c) are not present within the subject land or broader assessment area (Figure 2 and Figure 3).

2.1.11 Connectivity

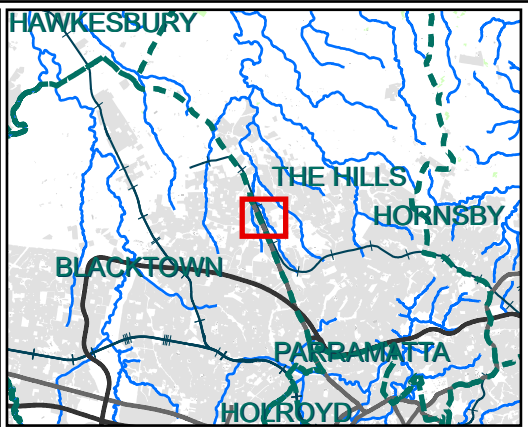
The primary connectivity feature within the subject land is the contiguous patch of remnant, riparian vegetation along Elizabeth Macarther Creek, which extends across the broader landscape via a network of watercourses, with only minor breaks in canopy cover over roads and other infrastructure. Although the western portion of the subject land has been cleared and the remnant vegetation is largely disturbed due to surrounding residential and urban development, connectivity with the surrounding landscape is maintained through the riparian vegetation of the creek. This vegetation contains several other habitat features that may be utilised by locally occurring species, and has the potential to provide breeding, foraging and dispersal resources for terrestrial and arboreal mammals, flying mammals, and avifauna.

Elizabeth Macarther Creek also provides an aquatic habitat corridor for fish species to disperse across the broader landscape, while also supporting breeding and dispersal habitat for a range of semi-terrestrial species, such as amphibians.

Connectivity along Elizabeth Macarthur Creek will not be substantially impacted by the project.

2.1.12 Additional landscape features

No additional landscape features were identified within the subject land.



Legend

- Subject land
- Development footprint
- IBRA Region/Sub-region
- Local wetlands
- Riparian buffers - Local wetlands

Strahler stream order

- 1
- 2
- 3

Strahler stream order buffers

- 1
- 2
- 3

Mitchell landscapes

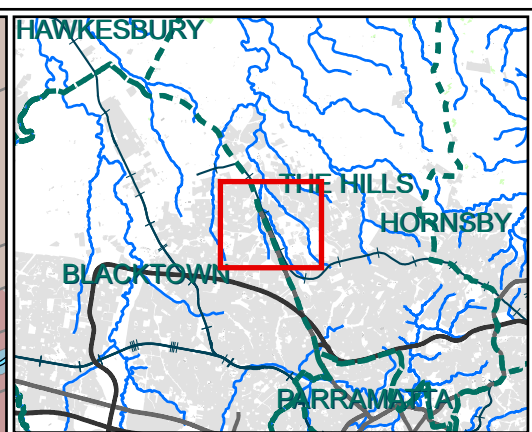
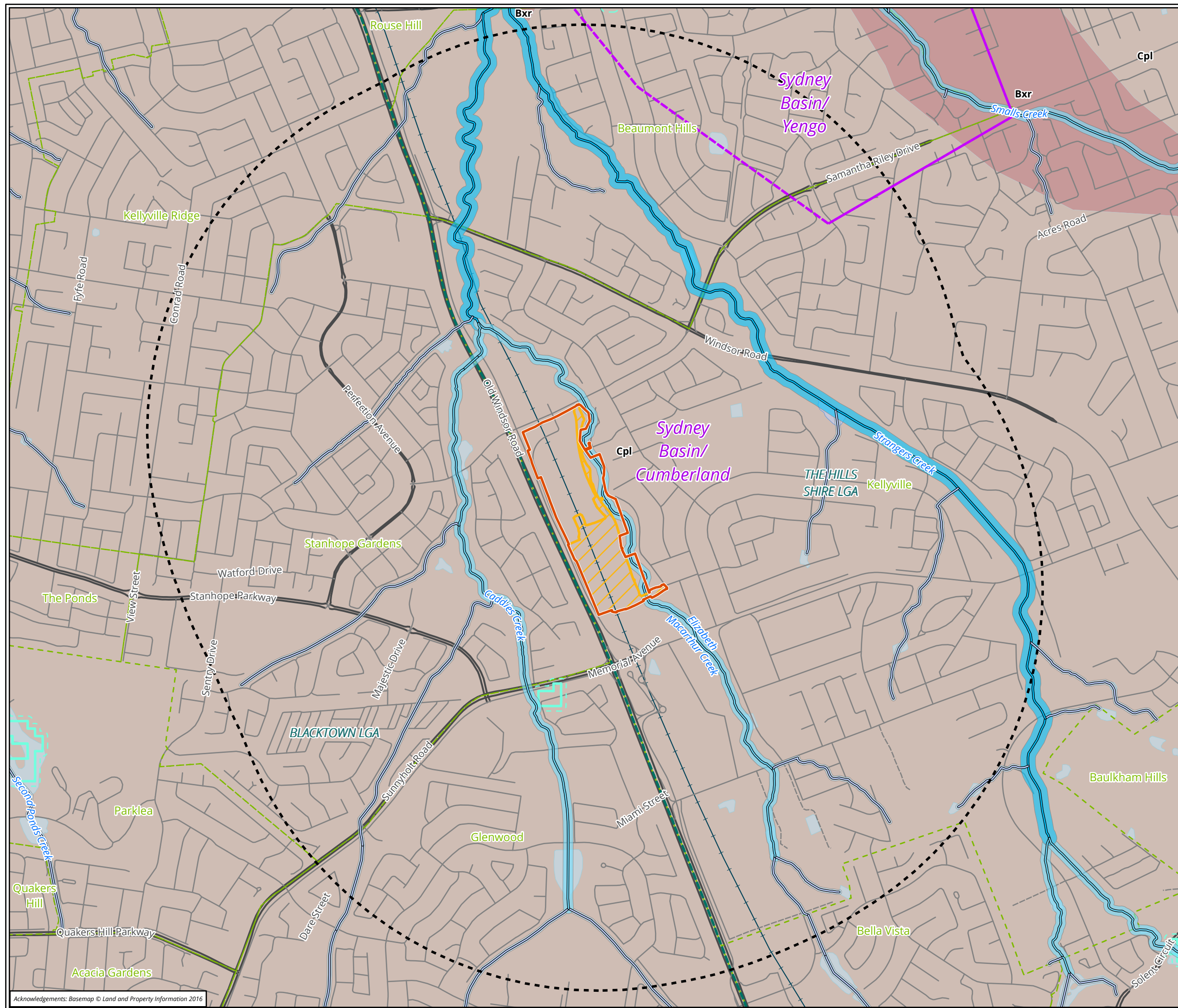
- Cpl,Cumberland Plain

Figure 2 Site map

0 50 100 150 200 250
Metres
Scale: 1:6,000 @ A3
Coordinate System: GDA2020 MGA Zone 56


APEM Group

Matter: 40523, Date: 03 February 2026
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyVillesP_BDAR.aprx
Layout: 40523_F2_Sitemap



Legend

- Subject land
- Development footprint
- Assessment area
- IBRA Region/Sub-region
- Local wetlands
- Riparian buffers - Local wetlands

Strahler stream order

- 1
- 2
- 3

Strahler stream order buffers

- 1
- 2
- 3

Mitchell landscapes

- Bxr, Blaxlands Ridge
- Cpl, Cumberland Plain

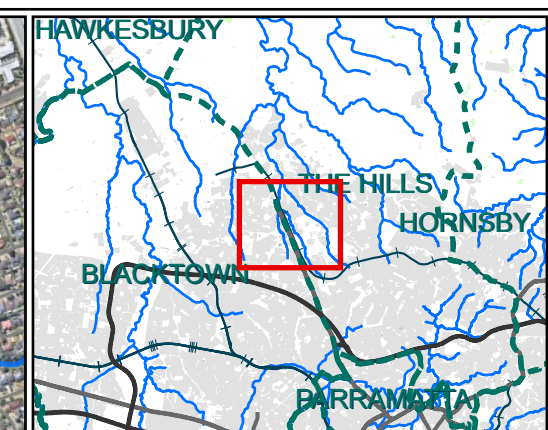
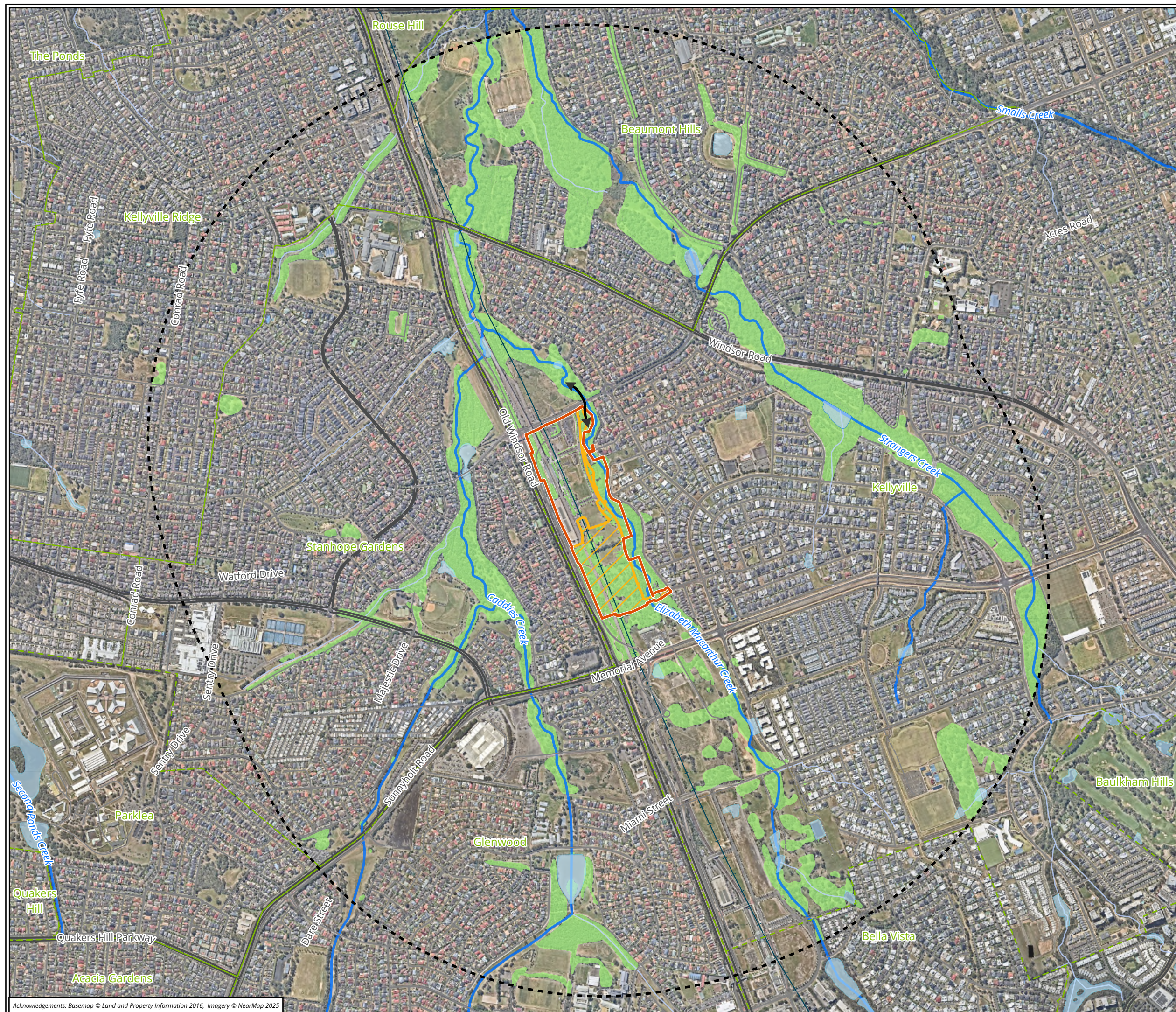
Figure 3 Location map

0 500
Metres

Scale: 1:14,000 @ A3
Coordinate System: GDA2020 MGA Zone 56

biosis
APEM Group

Matter: 40523, Date: 03 February 2026
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyvilleSP_BDAR.aprx
Layout: 40523_F3_Location



Legend

- Subject land
- Development footprint
- Assessment area
- Native vegetation
- Habitat connectivity

Figure 4 Native vegetation extent

0 500
Metres

Scale: 1:14,000 @ A3
Coordinate System: GDA2020 MGA Zone 56



Matter: 40523, Date: 03 February 2026
Prepared for: KE, Prepared by: JB, Last edited by: lharley
Location: P:\40500s\40523\Mapping\40523_KellyVillesP_BDAR.aprx
Layout: 40523_F4_NativeVeg

3 Native vegetation

The subject land is approximately 18.78 hectares in size, including 9.12 hectares of native vegetation with varying levels of disturbance and 3.88 hectares of non-native vegetation. Most of the native vegetation within the subject land is comprised of grassy woodland and forested wetland vegetation communities, which were recorded in a low to moderate condition and were largely restricted to within and adjacent to the riparian corridor along Elizabeth Macarthur Creek. Although remnant vegetation is somewhat disturbed as a result of previous clearing and management activities associated with surrounding development, some key habitat features such as large trees and hollows were recorded throughout the subject land.

3.1 Native vegetation and habitat assessment

3.1.1 Native vegetation extent

The extent of native vegetation, TECs, and vegetation integrity within the subject land was determined using the results of site investigations, previous studies undertaken at the site (Biosis 2024) and Section 4 of the BAM (DPIE 2020a).

Figure 5 provides a map of the native vegetation extent recorded within the subject land and development footprint, as assessed during field investigations undertaken in May 2024 and July 2025. The figure includes all areas of native vegetation (native ground cover and areas with canopy) within the subject land. Areas not shown as native vegetation cover within Figure 5, are considered cleared / non-native vegetation, and are addressed further below.

3.1.2 Review of existing information

Existing information regarding native vegetation was reviewed to inform field investigations including:

- Regional vegetation mapping including the NSW State Vegetation Type Map (SVTM C2.0M2.1) (NSW DCCEEW 2024b).
- Existing site reports including *Kellyville Station Precinct: Stage 2 Superlots D, E, F and Open Space Ecology Assessment Report* (Biosis 2024)
- Database searches.

Based on the results of the background review and the requirements of the BAM with respect to this BDAR, appropriate surveys were designed for the subject land and development footprint.

3.1.3 Field investigation of biodiversity values

A systematic biodiversity assessments of data included in this BDAR were conducted between 05 May 2024 and 14 November 2025 by Brooke Corrigan (Senior Botanist – Offset Coordinator), Jake Schwebel (Senior Botanist | Regional Coordinator – Northern NSW), Natasha Zahra (Botanist), Hugh Smylie (Graduate Botanist), Rachel Moore (Senior Zoologist), Erin Parker (Graduate Zoologist) and Courtney Kelly (Graduate Ecologist) under the terms of Biosis' Scientific Licence issued by NSW DCCEEW under the BC Act (SL100758, expiry date 30 June 2026). Fauna survey was conducted under the Secretary's Animal Care & Ethics Committee Approval (TRIM 17.892, expiry date 31 January 2028).

Assessment in accordance with the BAM was planned/overseen/carried out/managed by BAM Accredited Assessor Callan Wharfe (BAAS18138).

The subject land was surveyed in accordance with the BAM (DPIE 2020a), which involved:

- The identification and mapping of PCTs according to the structural definitions held in the BioNet Vegetation Classification database (NSW DCCEEW 2025b), with reference to information provided in NSW State Vegetation Type Map (SVTM C2.0M2.1) (NSW DCCEEW 2024b).
- Undertaking floristic plots within each vegetation zone in accordance with Section 4 of the BAM (DPIE 2020a), considering varying condition states and avoidance of ecotones, areas of disturbance, and edges.
- The identification of native and exotic plant species, according to the Flora of NSW (Harden 2002, 1993, 2000, 2002) with reference to recent taxonomic changes.
- Targeted searches for plant species of conservation significance according to *Surveying Threatened Plants and Their Habitats* (DPIE 2020b).
- Incidental observations using the “random meander” method (Cropper 1993).
- Identification of previous and current factors threatening the ecological function and survival of native vegetation within and adjacent to the subject land.
- An assessment of the natural resilience of the vegetation of the site.
- Identifying and mapping fauna habitats (e.g., hollow-bearing trees, rock outcropping etc.), assessing their condition and value to threatened fauna species, and considering threatened species’ habitat constraints.
- Observations of animal activity and searches for indirect evidence of fauna (such as scats, nests, burrows, hollows, tracks, scratches and diggings).
- Targeted surveys for threatened fauna species.

The conservation significance of plant species and plant communities was determined according to:

- BC Act for significance within NSW
- EPBC Act for significance within Australia.

Detailed field mapping and collection of GPS point locations were conducted using hand-held (uncorrected) tablet units (Samsung Galaxy Tab X) running the ArcGIS Field Maps application, using the inbuilt GPS, and aerial photo interpretation. Spatial locations are therefore considered to have an accuracy of generally ± 5 metres.

Areas of native vegetation for which a PCT could validly be assigned were identified and delineated in the field, and their condition determined and assigned. Identification of PCTs within the subject land was confirmed with reference to the community profile descriptors (and diagnostic species tests) held within the NSW State Vegetation Type Map (SVTM C2.0M2.0) (NSW DCCEEW 2024b) and NSW BioNet Vegetation Classification database (NSW DCCEEW 2025b). Locations of floristic plots surveyed are shown on Figure 7.

Further details of targeted survey for threatened flora and fauna species are provided in Section 4.2.1 below.

3.1.4 Local data

Local data was not used as part of this assessment.

3.2 Vegetation results

3.2.1 Non-native vegetation

Approximately 3.96 hectares of the subject land met the definition of non-native vegetation / cleared land and was not mapped as native vegetation (Figure 3). Due to the disturbed and managed nature of the area, exotic species commonly co-occur with native vegetation. The key delineation between exotic and native vegetation in these areas relies on the dominance of exotic species across all strata. Although some areas mapped as non-native vegetation contained disturbance tolerant native species (and in some cases at a moderate cover), these native species comprised widely cultivated lawn and pasture grass species that are not considered sufficient to warrant allocation of a PCT, in the absence of key diagnostic species required to be considered a patch of 'native vegetation'.

Areas not shown as native vegetation cover within Figure 5, and do not provide habitat for threatened species, do not require further assessment in accordance with Section 5.1.1.5 of the BAM (DPIE 2020a). Non-native vegetation which does provide habitat for threatened species is required to be assessed. The non-native vegetation within the subject land was assessed for threatened species; however, these areas are highly disturbed and contain a high cover of exotic species. No specific habitat features were recorded in the areas mapped as exotic vegetation, and they are not considered to provide habitat suitable for threatened species.

Non-native vegetation in the subject land is present in two forms, including:

- Exotic groundcover: a managed ground layer of exotic grasses and forbs over previously cleared land.
- Exotic vegetation: a planted exotic canopy with native midstory species, over an understory of exotic woody shrubs and a mixed groundcover.

A description of these vegetation types is provided in Table 4 and Table 5 below, respectively.

Table 4 Exotic groundcover

Exotic groundcover	
Common name	Exotic groundcover
Extent within subject land	3.79 ha
Description	Exotic groundcover is present as a managed ground layer and was recorded throughout the western portion of the subject land. This vegetation lacked a distinct native canopy layer or mid layer stratum, with vegetation restricted to a groundcover layer comprised of a composite of exotic pasture species and a low cover of scattered native grasses. This vegetation was largely dominated by a few exotic grasses and herbs, including <i>Paspalum dilatatum</i>, Kikuyu <i>Cenchrus clandestinus</i> and Lamb's Tongues <i>Plantago lanceolata</i>, with a variety of other common exotic species such as White Clover <i>Trifolium repens</i>, Onion Grass <i>Romulea rosea</i> var. <i>australis</i> and Winter Grass <i>Poa annua</i> present in low abundance. Native species were scattered throughout this vegetation, including Common Couch <i>Cynodon dactylon</i>, which was recorded in high abundance in places, and other native species such as Wiry Panic <i>Entolasia stricta</i>, Weeping Grass <i>Microlaena stipoides</i> and Kidney Weed <i>Dichondra repens</i>, which were all recorded with low cover. Although Common Couch was recorded with the highest abundance across this vegetation type, it is widely cultivated as a lawn and pasture grass, and as such, it is not considered to

Exotic groundcover	
	form part of a PCT for assessment under the BAM.
Survey effort	One BAM plot was collected within the exotic groundcover over the course of the field assessment (40523.B08). BAM plots are displayed on Figure 7.
Photo – Exotic vegetation	

Table 5 Exotic vegetation

Exotic vegetation	
Common name	Exotic vegetation
Extent within subject land	0.17 ha
Description	Exotic vegetation was recorded in a narrow strip within centre the of the subject land. This vegetation type was comprised of a mix of planted exotic and native species, with a low to moderate abundance of scattered woody weeds and a groundcover comprised of a combination of native and exotic grasses, herbs and forbs. The canopy was comprised entirely of a row of planted Radiata Pine <i>Pinus radiata</i>, over isolated patches of native species Willow-leaved Hakea <i>Hakea salicifolia</i>. The midstory was fairly sparse, with scattered occurrences of woody weed species such as Blackberry <i>Rubus fruticosus</i> sp. agg. and Small-leaved Privet <i>Ligustrum sinense</i>. The understory and groundcover layers were comprised of a mix of native species including Weeping Grass, Kidney Weed, <i>Oplismenus hirtellus</i>, Common Couch, <i>Oxalis perennans</i> and Indian Pennywort <i>Centella asiatica</i>, with a moderate cover of common exotic species such as Paspalum, Bridal Creeper <i>Asparagus asparagoides</i>, Lamb's Tongues, Paddy's Lucerne <i>Sida rhombifolia</i>, Moth Vine <i>Araujia sericifera</i> and Small St John's Wort <i>Hypericum gramineum</i>.
Survey effort	One BAM plot was collected within Exotic vegetation over the course of the field assessment (40523.B09). BAM plots are displayed on Figure 7.

Exotic vegetation

Photo – Exotic vegetation



3.2.2 Plant community types

The following PCTs were assessed as present within the subject land:

- PCT 3320 *Cumberland Shale Plains Woodland* (Table 6).
- PCT 3975 *Southern Lower Floodplain Freshwater Wetland* (Table 7).
- PCT 4025 *Cumberland Red Gum Riverflat Forest* (Table 8).

Table 6 to Table 8 provide detailed descriptions of the three PCTs recorded within the subject land. PCTs recorded within the subject land are shown in Figure 5.

Table 6 PCT 3320 Cumberland Shale Plains Woodland

PCT 3320 Cumberland Shale Plains Woodland	
Common name	Cumberland Shale Plains Woodland
Vegetation formation	Grassy Woodlands
Vegetation class	Coastal Valley Grassy Woodlands
Extent within subject land	5.73 ha
Condition	This community was recorded in a moderate, low and landscape plantings condition state within the subject land.
Description	In a moderate condition state, PCT 3320 was comprised of a canopy dominated by mature and juvenile Narrow-leaved Ironbark <i>Eucalyptus crebra</i> , with scattered occurrences of Forest Red Gum <i>Eucalyptus tereticornis</i> , Grey Box <i>Eucalyptus moluccana</i> and Rough-barked Apple <i>Angophora floribunda</i> . The sparse mid storey was comprised of a low cover of Native Blackthorn <i>Bursaria spinosa</i> , with low to moderate cover of vines Variable Glycine <i>Glycine tabacina</i> and Twining glycine <i>Glycine clandestina</i> . The understory and groundcover were comprised of a high cover of native grasses and forbs such as

PCT 3320 Cumberland Shale Plains Woodland	
	Weeping Grass, Kidney Weed, <i>Oplismenus hirtellus</i>, Whiteroot <i>Lobelia purpurascens</i>, Blue Flax-lily <i>Dianella caerulea</i>, <i>Themeda triandra</i> and Spiny-headed Mat-rush <i>Lomandra longifolia</i>. Exotic species were largely restricted to the understory throughout this vegetation zone, with species such as Paddy's Lucerne <i>Sida rhombifolia</i>, Panic Veldtgrass <i>Ehrharta erecta</i>, <i>Setaria parviflora</i>, Bridal Creeper, Paspalum and Madeira Winter Cherry <i>Solanum pseudocapsicum</i> and present in low to moderate abundance. In a low condition state, PCT 3320 was comprised of a scattered canopy of Grey Box, over a largely absent mid story layer. The ground layer was dominated by exotic grasses and other groundcover species Kikuyu <i>Cenchrus clandestinus</i>, Lamb's Tongues, White Clover, Fireweed <i>Senecio madagascariensis</i>, Smooth Catsear <i>Hypochaeris glabra</i> and Red-flowered Mallow <i>Modiola caroliniana</i>. The understory and groundcover was also comprised of scattered native species such as Kidney Weed, Weeping Grass, Variable Glycine and Bordered Panic <i>Entolasia marginata</i>. In a landscape plantings condition state, the vegetation contained species consistent with PCT 3320, including diagnostic canopy species Grey Box and Narrow-leaved Ironbark, as well as perennial herbs Spiny-headed Mat-rush and Blueberry Lilly <i>Dianella caerulea</i> var. <i>producta</i>. However, this vegetation type also contained <i>Melaleuca decora</i>, Swamp Oak <i>Casuarina glauca</i>, Australian Indigo <i>Indigofera australis</i> and Parramatta Wattle <i>Acacia parramattensis</i>. Common exotic ground cover species recorded across the majority of the site were also present in moderate to high abundance in this vegetation zone. The plantings that had been regularly spaced in repeated groupings, consistent with design guidelines and for their primary function of landscaping.
Survey effort	Four BAM plots were collected within PCT 3320 over the course of the field assessment, including: • Moderate: one BAM plot/transect (40523.B01). • Low: one BAM plot/transect (40523.B02). • Landscape planting: two BAM plots/transects (40523.B05 and 40523.B06). BAM plots are displayed on Figure 7.
Justification of PCT	Vegetation within the subject land meets the description for PCT 3320 (NSW DCCEEW 2025b) via the following: • The subject land occurs within the Sydney Basin IBRA bioregion and Cumberland Plain IBRA sub-bioregion. • The vegetation occurs on gentle topography associated with the shale plains of western Sydney. • Floristic data from the BAM plots collected within this vegetation zone was assessed against the list of positive diagnostic species for PCTs potentially present within the site, using the BioNet PCT Identification tool, with PCT 3320 found to be the best fit. This conclusion is based on: ○ The presence of species characteristic to PCT 3320, including Grey Box and Forest Red Gum (the dominant canopy species), Native Blackthorn and a grassy groundcover. ○ The combination of landscape feature listed above, with reference to the BioNet Vegetation Classification database, infer that the vegetation more closely aligned with PCT 3320 than other potential PCTs, such as PCT 3321.
TEC Status	NSW BC Act: <i>Cumberland Plain Woodland in the Sydney Basin Bioregion</i> CEEC (Cumberland Plain Woodland CEEC). PCT 3320 in the subject land is consistent with the listed TEC as the subject land is located on the Blacktown residual soil landscape, over surface Ashfield Shale of the Wianamatta Group surface Geology, which is consistent with the scientific determination for <i>Cumberland Plain Woodland in the Sydney Basin Bioregion</i>. Vegetation is present as a

PCT 3320 Cumberland Shale Plains Woodland	
	woodland with characteristic species such as Forest Red Gum, Grey Box and Narrow-leaved Ironbark dominant. Commonwealth EPBC Act: <i>Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest</i> CEEC (Cumberland Plain Shales Woodland CEEC). Only PCT 3320 in moderate condition meets the criteria outlined in Table 1 of the Listing Advice for this community, as the patch size is larger than 0.5 ha in size, the patch is connected to other native vegetation remnants and native vegetation makes up more than 30% of the perennial understory (Threatened Species Scientific Committee 2009). State and Commonwealth TECs are mapped on Figure 6.
Estimate of percent cleared value of PCT (BioNet)	93.03% (NSW DCCEEW 2025b).
PCT 3320 – moderate condition	
PCT 3320 – low condition	

PCT 3320 Cumberland Shale Plains Woodland

PCT 3320 – landscape planting condition



Table 7 PCT 3975 Southern Lower Floodplain Freshwater Wetland

PCT 3975 Southern Lower Floodplain Freshwater Wetland	
Common name	Southern Lower Floodplain Freshwater Wetland
Vegetation formation	Freshwater Wetlands
Vegetation class	Coastal Freshwater Lagoons
Extent within subject land	0.15 ha
Condition	This community was recorded in a moderate condition state within the subject land.
Description	PCT 3975 in the subject land was present fringing waterbodies within or adjoining Elizabeth Macarthur Creek. In a moderate condition state, it is characterised by native aquatic and ground layer species Broad-leaved Cumbungi <i>Typha orientalis</i> and Slender Knotweed <i>Persicaria decipiens</i> , with Rainbow Fern <i>Calochlaena dubia</i> , Lesser Joyweed <i>Alternanthera denticulata</i> , Harsh Ground Fern <i>Hypolepis muelleri</i> also present in low abundance. Exotic species such as Trad <i>Tradescantia fluminensis</i> , Sharp Rush <i>Juncus acutus</i> , Green Cestrum <i>Cestrum parqui</i> , Curled Dock <i>Rumex crispus</i> , Vasey Grass <i>Paspalum urvillei</i> , and Red-flowered Mallow are also present.
Survey effort	One BAM plot was collected within moderate condition PCT 3975 over the course of the field assessment (40523.B04). BAM plots are displayed on Figure 7.
Justification of PCT	Vegetation within the subject land meets the description for PCT 3975 (NSW DCCEEW 2025b) via the following: • The subject land occurs within the Sydney Basin IBRA bioregion and Cumberland Plain IBRA sub-bioregion. • The vegetation occurs in depressions on Quaternary alluvial deposits on coastal floodplains of the Central and South Coast. • Floristic data from the BAM plot collected within this vegetation zone was assessed against the list of positive diagnostic species for PCTs potentially present within the

PCT 3975 Southern Lower Floodplain Freshwater Wetland	
	site, using the BioNet PCT Identification tool, with PCT 3975 found to be the best fit. This conclusion is based on: ○ The presence of species characteristic to PCT 3975, including Broad-leaved Cumbungi and Slender Knotweed. ○ The combination of landscape feature listed above, with reference to the BioNet Vegetation Classification database, infer that the vegetation more closely aligned with PCT 3975 than other potential PCTs.
TEC Status	NSW BC Act: <i>Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i> EEC (Freshwater Wetlands EEC). PCT 3975 in the subject land is consistent with the listed TEC as the landscape position fits the criteria of silts, muds or humic loams in low-lying parts of floodplains, alluvial flats, depressions, drainage lines, backswamps, lagoons and lakes, and is dominated by herbaceous species including Broad-leaf Cumbungi and Slender Knotweed. The TEC can form mosaics with other floodplain communities, including River-Flat Eucalypt Forest on Coastal Floodplains, which is also present within the subject land. Commonwealth EPBC Act: The PCT is not associated with TECs listed under the EPBC Act. State and Commonwealth TECs are mapped on Figure 6.
Estimate of percent cleared value of PCT (BioNet)	92.99% (NSW DCCEEW 2025b).
PCT 3975 – moderate condition	

Table 8 PCT 4025 Cumberland Red Gum Riverflat Forest

PCT 4025 Cumberland Red Gum Riverflat Forest	
Common name	Cumberland Red Gum Riverflat Forest
Vegetation formation	Forested Wetlands
Vegetation class	Coastal Floodplain Wetlands
Extent within subject land	3.33 ha

PCT 4025 Cumberland Red Gum Riverflat Forest	
Condition	This community was recorded in a moderate and revegetated condition state within the subject land.
Description	In a moderate condition state, PCT 4025 is comprised of a canopy dominated by Cabbage Gum, Forest Red Gum and Rough-barked Apple, with Broad-leaved Apple and Grey Box also present in low abundance. The mid-storey contains Black Wattle <i>Acacia decurrens</i>, Native Blackthorn, Swamp Oak, River Oak <i>Casuarina cunninghamiana</i> and Kangaroo Apple <i>Solanum linearifolium</i>. The ground layer is dominated by native species Weeping Grass and Kidney Weed, with Forest Nightshade <i>Solanum prinophyllum</i>, Blady Grass <i>Imperata cylindrica</i>, <i>Glycine clandestina</i>, Fishweed <i>Einadia trigonos</i> and Common Couch also present. In a revegetated condition state, PCT 4025 is characterised by a series of plantings located along the interface between Elizabeth Macarthur Creek and Decora Drive, containing Spiny Headed Mat-rush <i>Lomandra longifolia</i>, False Sarsparilla <i>Hardenbergia violacea</i> and Dusky Coral Pea <i>Kennedia rubicunda</i>. The revegetated plantings are densely planted along a batter and are not managed for landscaping aesthetics, but rather, have predominantly been planted for slope stabilisation.
Survey effort	Two BAM plots were collected within PCT 4025 over the course of the field assessment, including: • Moderate: one BAM plot/transect (40523.B04). • Revegetated: one BAM plot/transect (40523.B07). BAM plots are displayed on Figure 7.
Justification of PCT	Vegetation within the subject land meets the description for PCT 4025 via the following: • The subject land occurs within the Sydney Basin IBRA bioregion and Cumberland Plain IBRA sub-bioregion. • The vegetation occurs on silts, clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains. • Floristic data from the BAM plots collected within this vegetation zone was assessed against the list of positive diagnostic species for PCTs potentially present within the site, using the BioNet PCT Identification tool, with PCT 4025 found to be the best fit. This conclusion is based on: ○ The presence of species characteristic to PCT 4025, including Forest Red Gum, Rough-barked Apple, Native Blackthorn and Black Wattle. ○ The combination of landscape feature listed above, with reference to the BioNet Vegetation Classification database, infer that the vegetation more closely aligned with PCT 4025 than other potential PCTs.
TEC Status	NSW BC Act: <i>River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales, North Coast, Sydney Basin and South East Corner Bioregions</i> EEC (River-Flat Eucalypt Forest EEC). PCT 4025 in the subject land is consistent with the listed TEC as the vegetation is located on silts, clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains and contains key species including Forest Red Gum, Cabbage Gum, Rough-barked Apple, Native Blackthorn, Swamp Oak, Black Wattle, Weeping Grass and Kidney Weed. Commonwealth EPBC Act: <i>River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria</i> CEEC (River-Flat Eucalypt Forest CEEC). Landscape position and diagnostic species are consistent with the EPBC TEC criteria, similar to those described for the BC Act listing above. PCT 4025 in all conditional states within the subject land meets thresholds for condition B3 as; the patch is ≥ 2 ha and vegetation meets the floristic condition requirements in Table 4 of the conservation advice (DCCEEW 2020). State and Commonwealth TECs are mapped on Figure 6.

PCT 4025 Cumberland Red Gum Riverflat Forest	
Estimate of percent cleared value of PCT (BioNet)	88.84% (NSW DCCEEW 2025b).
PCT 4025 – moderate condition	
PCT 4025 – revegetated condition	

3.2.3 Threatened ecological communities

Vegetation within the subject land was found to represent three TECs listed under the NSW BC Act, and two TECs listed under the Commonwealth EPBC Act, as outlined in Table 9 and Table 10 below and illustrated on Figure 8.

Table 9 Summary of BC Act TECs within the subject land and development footprint

BC Act TEC	Listing status	Subject land (Ha)	Development footprint (Ha)
<i>Cumberland Plain Woodland in the Sydney Basin Bioregion</i>	Critically Endangered	5.73	4.18
<i>River-flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions</i>	Endangered	3.33	1.19
<i>Sydney Freshwater Wetlands in the Sydney Basin Bioregion</i>	Endangered	0.15	0.04

Table 10 Summary of EPBC Act TECs within the subject land

EPBC Act TEC	Listing status	Subject land (Ha)	Development footprint (Ha)
<i>Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest</i>	Critically Endangered	2.06	1.95
<i>River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria</i>	Critically Endangered	3.33	1.19

All PCT 4025 in the subject land and development footprint was found to meet the listing requirements for the EPBC Act listed community *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria*, including vegetation in a Revegetated condition state. In accordance with Section 5.1.2.4 of the Conservation Advice, revegetated or replanted sites are included as part of the Commonwealth listed community, provided the vegetation meets key diagnostic criteria (DCCEEW 2020). In order to be listed as the EPBC Act community, vegetation must meet the condition classes and patch size thresholds outlined in Table 4 of the Conservation Advice. PCT 4025 in the subject land meets the thresholds for condition B3 as the patch is ≥ 2 ha and vegetation meets the floristic condition requirements for the community, including $\geq 50\%$ of its total perennial understorey vegetation cover is comprised of native species, ground cover richness contains ≥ 6 native species per sample plot and at least 10 large trees recorded per hectare.

Only PCT 3320 in moderate condition within the subject land and development footprint was found to meet the listing requirements for the EPBC Act listed community *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*. PCT 3320 in low and landscape plantings conditional states does not meet the listing requirements for this community as vegetation does not meet the condition and patch size thresholds outlined in Table 1 of the Conservation Advice (Threatened Species Scientific Committee 2009). Less than 30% of the perennial understory is comprised of native species for both low and landscape plantings PCT 3320, and PCT 3320 landscape plantings contains less than 10 % canopy cover per sample plot.

3.3 Vegetation integrity assessment

3.3.1 Vegetation zones and patch size class

Plant Community Types within the subject land were assessed and stratified, based on broad condition state, into vegetation zones in accordance with Section 4.3 of the BAM, and as described in Table 6 to Table 8 above. This resulted in six vegetation zones identified within the development footprint. Table 11 describes each of the zones and provides details on the numbers of BAM floristic plots undertaken in each zone.

Patch size classes for each vegetation zone present within the subject land were assessed as per Section 4.3.2 of the BAM (DPIE 2020a) using a select process in ArcGIS. All native vegetation with a gap of less than 100 metres from the next area of native vegetation (or ≤ 30 metres for non-woody ecosystems), is considered a single patch, with a patch able to extend onto adjoining land.

Native vegetation within the subject land was mapped sequentially and it was found to form part of a relatively large patch of connecting vegetation with an area of approximately ≥ 100 hectares (Figure 8). The connected vegetation comprises vegetation within the Elizabeth Macarthur Creek, Caddies Creek and Strangers Creek riparian corridors, extending northwest from the subject land to larger remnants associated connected watercourses of the upper Hawksbury River Catchment.

Patch size classes for each vegetation zone are also outlined in Table 11 below.

Table 11 Vegetation zones within the subject land

Vegetation zone	Plant Community Type	Condition	BAM plots completed	Area (ha)	Max. patch size development footprint
3320_Landscape plantings	PCT 3320 <i>Cumberland Shale Plains Woodland</i>	Landscape plantings	2	3.29	≥ 100 ha
3320_Low		Low	1	0.28	≥ 100 ha
3320_Moderate		Moderate	2	2.07	≥ 100 ha
3975_Moderate	PCT 3975 <i>Southern Lower Floodplain Freshwater Wetland</i>	Moderate	1	0.15	≥ 100 ha
4025_Revegetated	PCT 4025 <i>Cumberland Red Gum Riverflat Forest</i>	Revegetated	1	0.70	≥ 100 ha
4025_Moderate		Moderate	2	2.62	≥ 100 ha

3.3.2 Vegetation integrity

Vegetation integrity, or condition, was assessed using data obtained from undertaking BAM plots within the vegetation zones, as per Section 4.3.4 of the BAM (DPIE 2020a). Plot data was collected via:

- A 20 metre x 50 metre quadrat and 50 metre transect for assessment of site attributes and function.
- A 20 metre x 20 metre quadrat, nested within the larger quadrat for full floristic survey to determine composition and structure of the PCT.

The minimum number of BAM plots per vegetation zone was determined using Table 3 of the BAM (DPIE 2020a). In total, nine BAM plots have been completed within the vegetation zones present within development footprint, details are provided in Table 12 and shown on Table 13

Table 12 BAM plots completed within the subject land

BAM plot reference	Vegetation zone
40523.B01	3320_Moderate
40523.B02	3320_Low
40523.B03	4025_Moderate
40523.B04	3975_Moderate
40523.B05	3320_Landscape plantings
40523.B06	3320_Landscape Plantings
40523.B07	4025_Revegetated
40523.B08	N/A (Exotic vegetation)
40523.B09	N/A (Exotic vegetation)
40523.B10	4025_Moderate
40523.B11	3320_Moderate

Assessment of vegetation integrity was undertaken using standard benchmark data as outlined in the BAM and held in the BioNet Vegetation Classification database (NSW DCCEEW 2025b). A list of flora species was compiled for each BAM plot completed and is included in Appendix 3. Records of all flora species will be submitted to NSW DCCEEW for incorporation into the Atlas of NSW Wildlife.

3.3.3 Vegetation integrity score

Plot data was entered into the BAM calculator to determine vegetation integrity score. Plot data are presented in Appendix 3, with vegetation integrity scores for each vegetation zones provided in Table 13.

Table 13 Vegetation zone integrity scores

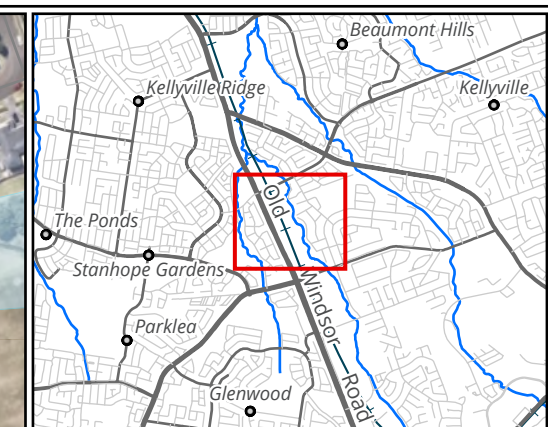
Vegetation zone	Composition score	Structure score	Function score	VI score*	HBTs present
3320_Landscape plantings	20.0	3.1	29.9	12.4	No
3320_Low	20.0	20.2	46.1	26.5	Yes
3320_Moderate	49.5	81.5	79.5	68.4	Yes
3975_Moderate	68.4	5.0	-	18.4	Yes
4025_Revegetated	59.1	41.8	65.0	54.4	No
4025_Moderate	51.6	67.6	97.8	69.9	Yes

*Benchmark (pristine) condition vegetation would receive a VI score of 100.

As outlined in Section 9.2.1 of the BAM (DPIE 2020a), an offset is required for impacts on native vegetation where the vegetation integrity score is:

- ≥ 15 where the PCT is representative of an endangered or critically endangered ecological community.
- ≥ 17 where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or is representative of a vulnerable ecological community.
- ≥ 20 where the PCT is not representative of a TEC or associated with threatened species habitat.

As such, ecosystem credit offsets are not required for vegetation zone 3320_Landscape plantings due to its VI score of 12.4.



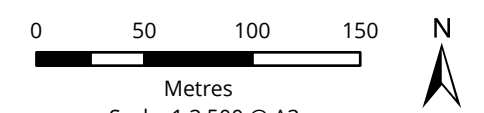
Legend

- Subject land
- Development footprint
- Hollow-bearing tree

Plant community type

- 3320 - Cumberland Shale Plains Woodland
- 3975 - Southern Lower Floodplain Freshwater Wetland
- 4025 - Cumberland Red Gum Riverflat Forest
- Exotic groundcover

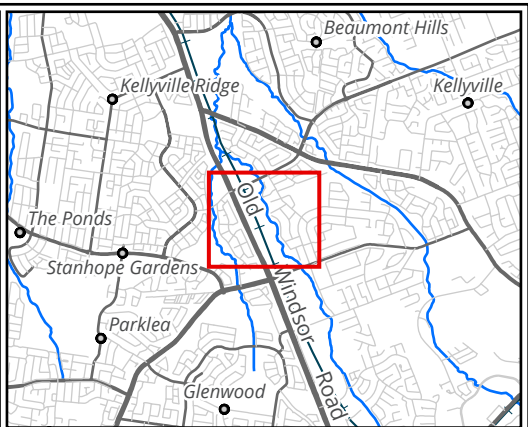
Figure 5 Plant community types within the subject land



Scale: 1:3,500 @ A3
Coordinate System: GDA2020 MGA Zone 56

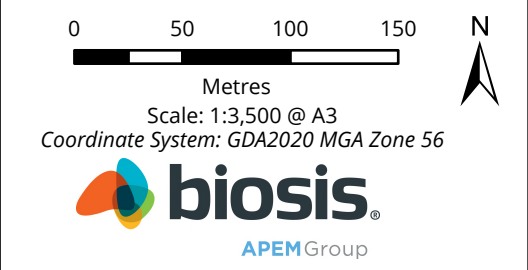


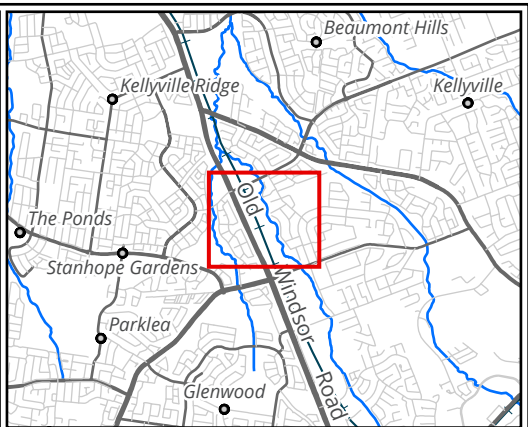
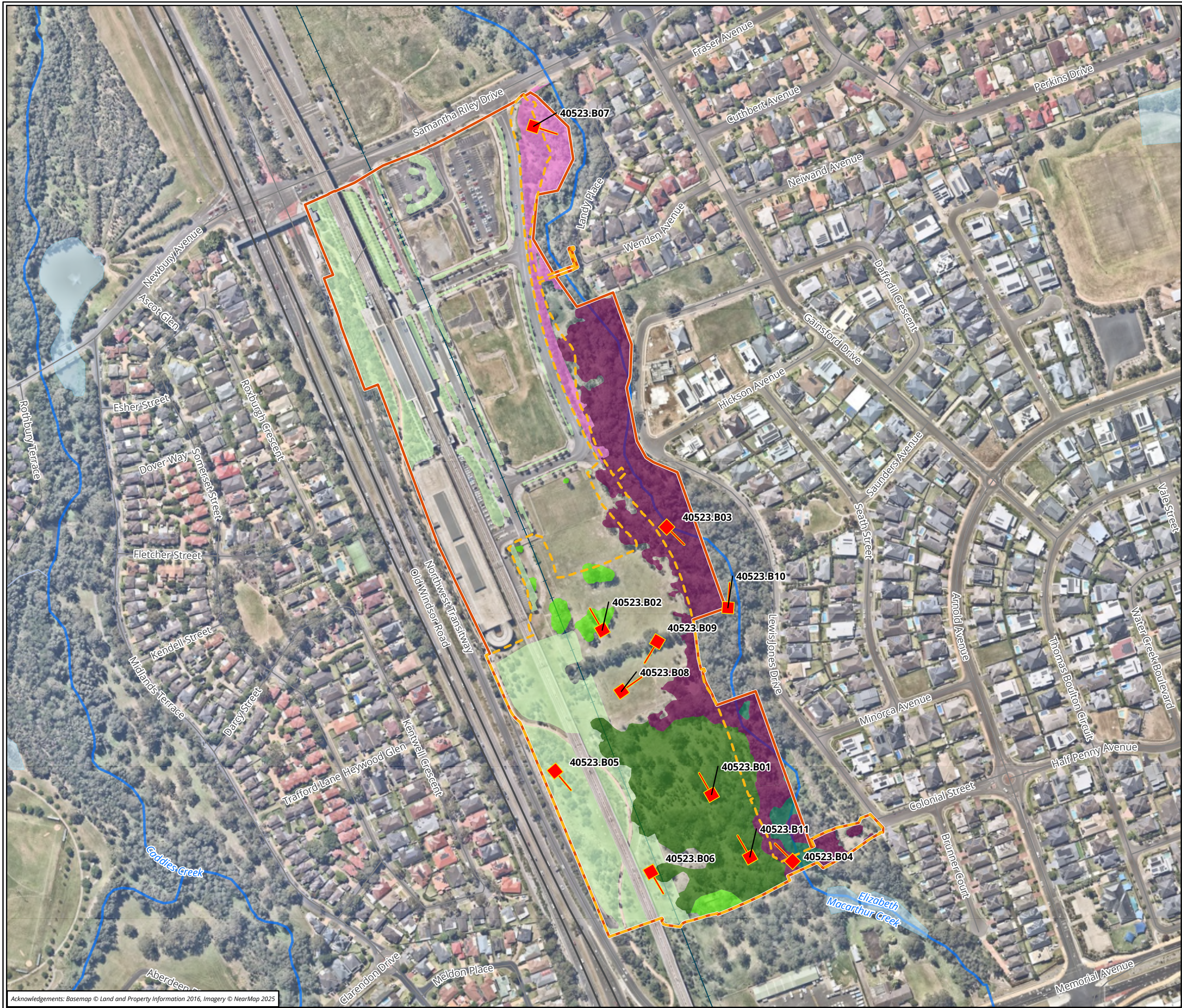
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Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\mapping\40523_KellyvilleSP_BDAR.aprx
Layout: 40523_FS_PCTs



- Legend**
- Subject land
 - Development footprint
- Vegetation zone**
- 3320_Moderate
 - 3320_Low
 - 3320_Planted
 - 3975_Moderate
 - 4025_Moderate
 - 4025_Revegetated
- Threatened ecological communities (BC Act)**
- Cumberland Plain Woodland in the Sydney Basin Bioregion (CEEC)
 - Freshwater Wetlands on Coastal Floodplains of the New South
 - Wales North Coast, Sydney Basin and South East Corner Bioregions (EEC)
 - River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (EEC)
- (EPBC Act)**
- Cumberland Plain Woodland (CEEC)
 - Riverflat Euc Forest (CEEC)

Figure 6 Threatened ecological communities within the subject land





Legend

- Subject land
- Development footprint
- BAM plot

Vegetation zone

- 3320_Moderate
- 3320_Low
- 3320_Planted
- 3975_Moderate
- 4025_Moderate
- 4025_Revegetated

Figure 7 Vegetation zones and plot locations

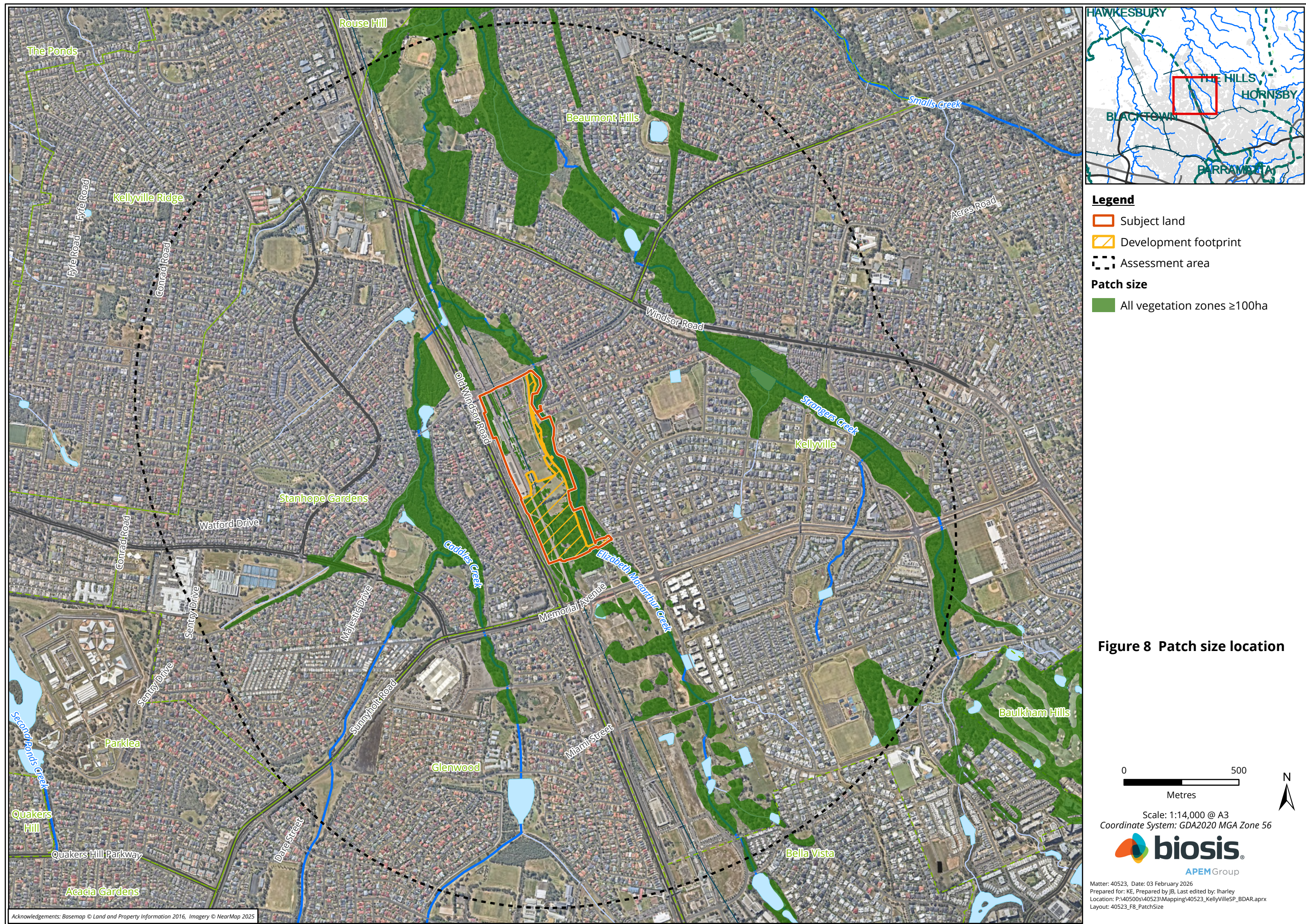
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Scale: 1:3,500 @ A3

Coordinate System: GDA2020 MGA Zone 56

biosis
APEM Group

Matter: 40523, Date: 03 February 2026,
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyvilleSP_BDAR.aprx
Layout: 40523_F7_VegZones



4 Threatened species

4.1 Ecosystem credit species

A list of predicted species (ecosystem credit species) expected to occur within the subject land was generated as per Section 5 of the BAM (DPIE 2020a). Impacts to these species require assessment, however targeted survey is not required as these species are assumed to occur, based on the occurrence of the PCTs, habitat constraints, native vegetation cover in the landscape and calculated patch sizes. These species are identified as ecosystem credit species in the Threatened Biodiversity Data Collection (TBDC). Table 14 lists the ecosystem credit species that could not be discounted, based on geographical restrictions or a lack of suitable habitat, from using the subject land on occasion. These species were considered when prescribing management and mitigation measures for the project.

Table 14 Ecosystem credit species (predicted species) with potential to occur

Species name	Common name
<i>Anthochaera phrygia</i>	Regent Honeyeater (Foraging)
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow
<i>Botaurus poiciloptilus</i>	Australasian Bittern
<i>Calidris ferruginea</i>	Curlew Sandpiper (Foraging)
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo (foraging)
<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo (Foraging)
<i>Chthonicola sagittata</i>	Speckled Warbler
<i>Circus assimilis</i>	Spotted Harrier
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)
<i>Daphoenositta chrysoptera</i>	Varied Sittella
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork
<i>Epthianura albifrons</i>	White-fronted Chat
<i>Falco subniger</i>	Black Falcon
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle
<i>Gallinago hardwickii</i>	Latham's Snipe
<i>Glossopsitta pusilla</i>	Little Lorikeet
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle (Foraging)
<i>Hieraaetus morphnoides</i>	Little Eagle (foraging)
<i>Hirundapus caudacutus</i>	White-throated Needletail
<i>Irediparra gallinacea</i>	Comb-crested Jacana
<i>Ixobrychus flavicollis</i>	Black Bittern
<i>Lathamus discolor</i>	Swift Parrot (Foraging)
<i>Limosa limosa</i>	Black-tailed Godwit (Foraging)

Species name	Common name
<i>Lophoictinia isura</i>	Square-tailed Kite (Foraging)
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat
<i>Miniopterus australis</i>	Little Bent-winged Bat (Foraging)
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat (Foraging)
<i>Neophema pulchella</i>	Turquoise Parrot
<i>Oxyura australis</i>	Blue-billed Duck
<i>Pandion cristatus</i>	Eastern Osprey (Foraging)
<i>Petaurus australis</i>	Yellow-bellied Glider
<i>Petroica boodang</i>	Scarlet Robin
<i>Petroica phoenicea</i>	Flame Robin
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox (Foraging)
<i>Pycnoptilus floccosus</i>	Pilotbird
<i>Rostratula australis</i>	Australian Painted Snipe
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat
<i>Stagonopleura guttata</i>	Diamond Firetail
<i>Stictonetta naevosa</i>	Freckled Duck
<i>Varanus rosenbergi</i>	Rosenberg's Goanna

4.2 Species credit species

Species credit species are threatened species for which vegetation surrogates and/or landscape features cannot reliably predict the likelihood of their occurrence, or components of their habitat. These candidate species are identified as species credit species in the TBDC. A targeted survey or an expert report is required to confirm the presence of these species on the subject land, or alternatively the species can be assumed to be present (DPIE 2020a).

Appendix 2 provides the lists of species credit species predicted to occur within the subject land based on the IBRA subregion(s) on/within which the project occurs, the native vegetation cover present within the 1500 metre buffer area, the PCTs present within subject land, and patch sizes listed in Table 11.

The potential for a species to occur within the subject land was assessed in accordance with Section 5.2 of the BAM (DPIE 2020a) and species with geographical restrictions, or habitat constraints not present, were not required to be assessed. A total of 11 predicted species credit species have been excluded from occurring within the subject land based either lack of suitable habitat, substantial degradation of existing potential habitat, or absence of habitat constraints or geographic constraints. These species are listed below, along with justification for exclusion from further assessment:

- Black-tailed Godwit *Limosa limosa* (Breeding) – the subject land does not occur within the Important Habitat Map for this species (NSW DCCEEW 2025d).

- Curlew Sandpiper *Calidris ferruginea* (Breeding) – the subject land does not occur within the Important Habitat Map for this species (NSW DCCEEW 2025d).
- Dwarf Kerrawang *Commersonia prostrata* – this species is associated with PCT 3975 in the subject land; however, this PCT occurs along a degraded creek line on shale derived soils, which does not provide suitable habitat for this species.
- Giant Burrowing Frog *Heleioporus australiacus* – habitat within the subject land was considered degraded and unlikely to support suitable habitat or breeding resources for this species.
- Grey-headed Flying-fox *Pteropus poliocephalus* (Breeding) – no known breeding camps occur within the subject land.
- Large Bent-winged Bat *Miniopterus orianae oceanensis* (Breeding) – the subject land (or surrounds) does not contain suitable breeding habitat for this species in the form of caves, culverts and other man-made structures.
- Large-eared Pied Bat *Chalinolobus dwyeri* – the subject land is not located within 2 kilometres of suitable breeding habitat for this species. Although parts of the broader Kellyville locality occur on the Hawkesbury Sandstone Formation (including areas along Smalls Creek, which is just further than 2 km from the subject land), significant rocky areas comprised of caves and overhangs that represent breeding and roosting habitat are not present.
- Little Bent-winged Bat *Miniopterus australis* (Breeding) – the subject land (or surrounds) does not contain suitable breeding habitat for this species in the form of caves, culverts and other man-made structures.
- *Pomaderris prunifolia* (Endangered population) – the subject land does not occur within the LGAs in the Determination listing for this population.
- Regent Honeyeater *Anthochaera phrygia* (Breeding) – the subject land does not occur within the Important Habitat Map for this species (NSW DCCEEW 2025d).
- Swift Parrot *Lathamus discolor* (Breeding) – the subject land does not occur within the Important Habitat Map for this species (NSW DCCEEW 2025d).

A detailed assessment of potential for occurrence, and potential for impact, for all species credit species predicted to occur within the subject land is provided in Appendix 2. Species credit species considered to potentially occur within the subject land and thus considered 'candidate species credit species' have been the subject of the target of threatened species surveys.

All candidate species credit species considered as part of this assessment, and their associated method of assessment, are listed in Table 15 (flora species) and Table 16 (fauna species).

Threatened flora

Habitats for threatened flora species within the subject land are largely considered degraded due to the high degree of management, history of clearing and grazing and disturbance associated with surrounding urban development. Open areas are typically dominated by exotic pasture grasses and herbaceous exotics commonly recorded in maintained lawns and fields. The remainder of the subject land is comprised of native vegetation in varying conditional states, predominantly of a moderate quality around Elizabeth Macarthur Creek. This vegetation was characterised, in part, by a series of mature canopy trees and fewer exotic species, likely due to slightly lower levels of disturbance. Although of higher quality than the remainder of the subject land, the riparian vegetation occurs as an edge effected linear patch that is partially degraded, lacking significant connectivity with surrounding vegetation.

Table 15 provides a list of candidate flora species credit species considered in this assessment, each species' required survey period and the relevant method of assessment. Further detail of the targeted surveys undertaken are provided below and shown on Figure 9.

Table 15 Candidate flora species credit species

Species name	Common name	Survey period	Method of assessment
<i>Acacia pubescens</i>	Downy Wattle	All year	Transect searches
<i>Deyeuxia appressa</i>	-	December	Transect searches
<i>Dillwynia tenuifolia</i>	-	August – October	Transect searches
<i>Eucalyptus benthamii</i>	Camden White Gum	All year	Transect searches
<i>Eucalyptus glaucina</i>	Slaty Red Gum	All year	Transect searches
<i>Grevillea juniperina subsp. Juniperina</i>	Juniper-leaved Grevillea	All year	Transect searches
<i>Hibbertia puberula</i>	-	October - December	Transect searches
<i>Hibbertia sp. Bankstown</i>	-	September – December	Transect searches
<i>Marsdenia viridiflora subsp. viridiflora</i>	-	November – February	Transect searches
<i>Maundia triglochinosoides</i>	-	November – March	Transect searches
<i>Micromyrtus minutiflora</i>	-	All year	Transect searches
<i>Persicaria elatior</i>	Tall Knotweed	December – May	Transect searches
<i>Persoonia hirsuta</i>	Hairy Geebung	All year	Transect searches
<i>Persoonia nutans</i>	Nodding Geebung	All year	Transect searches
<i>Pimelea curviflora var. curviflora</i>	-	October – March	Transect searches
<i>Pimelea spicata</i>	Spiked Rice-flower	All year	Transect searches
<i>Pomaderris brunnea</i>	Brown Pomaderris	August – October	Transect searches
<i>Pterostylis saxicola</i>	Sydney Plains Greenhood	October	Transect searches
<i>Pultenaea parviflora</i>	-	September – November	Transect searches
<i>Pultenaea pedunculata</i>	Matted Bush-pea	September – November	Transect searches
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	April – June	Transect searches
<i>Wahlenbergia multicaulis</i>	Tagdell's Bluebell	All year	Transect searches

Threatened fauna

Fauna habitat assessments were undertaken to determine whether the vegetation to be impacted by the proposed development contained microhabitats suitable to support the candidate fauna species credit species, as outlined in Appendix 2.

Table 16 provides a list of candidate fauna species credit species considered in the current assessment, each species' required survey period and the relevant method of assessment. Further detail of the targeted surveys undertaken are provided below and shown on Figure 9.

Table 16 Candidate fauna species credit species

Species name	Common name	Survey period	Method of assessment
<i>Burhinus grallarius</i>	Bush Stone-curlew	All year	Spotlighting and vegetation flushing
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	October – January	Search for nests and evidence of presence
<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo	April – August	Search for nests and evidence of presence
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	October – March	Spotlighting
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	July – December	Habitat assessment and search for nests and evidence of presence
<i>Hieraaetus morphnoides</i>	Little Eagle	August – October	Habitat assessment and search for nests and evidence of presence
<i>Litoria aurea</i>	Green and Golden Bell Frog	November – April	Active searches incl. call playback and spotlighting (4 nights)
<i>Lophoictinia isura</i>	Square-tailed Kite	September – January	Habitat assessment and search for nests and evidence of presence
<i>Meridolum corneovirens</i>	Cumberland Plain Land Snail	All year	Modified Spot Assessment Technique (SAT) surveys and spotlighting
<i>Myotis macropus</i>	Southern Myotis	October – March	Acoustic bat detectors in areas of suitable habitat (4 nights)
<i>Ninox connivens</i>	Barking Owl	All year	Spotlighting/call playback (6 nights)
<i>Ninox strenua</i>	Powerful Owl	All year	Spotlighting/call playback (6 nights)
<i>Pandion cristatus</i>	Eastern Osprey	April – November	Search for nests and evidence of presence
<i>Petauroides volans</i>	Southern Greater Glider	All year	Spotlighting
<i>Petaurus norfolcensis</i>	Squirrel Glider	All year	Spotlighting
<i>Phascolarctos cinereus</i>	Koala	All year	SAT surveys and spotlighting
<i>Tyto novaehollandiae</i>	Masked Owl	All year	Spotlighting/call playback (6 nights)

4.2.1 Threatened species survey details

Targeted threatened species surveys of the subject land were undertaken over multiple days between July and November in 2025. Weather observations for each survey date are shown in Table 17.

It should be noted that two threatened flora species and four threatened fauna species that are listed as candidate species credit species are yet to be surveyed. These species will be surveyed during additional targeted survey undertaken in December 2025.

Table 17 Weather observations during targeted flora and fauna surveys (Baulkham Hills and Parramatta, NSW)

Survey undertaken	Survey date	Temperature (°C)		Rain (mm)
		Min.	Max.	
- Targeted flora survey – July - Koala and Snail SAT surveys - Diurnal bird surveys	15/07/2025	4.2	14.3	0
	16/07/2025	2.8	17.8	0
Targeted flora survey – September	19/09/2025	9.7	24.2	0
- Targeted flora survey – October - Stick nest searches - Habitat assessment for microbats	27/10/2025	15.0	25.2	0
- Frog surveys – call playback - Owl surveys (3 nights only) - Spotlighting - Nocturnal searches	3/11/2025	16.4	32.2	0
	4/11/2025	17.0	23.5	0
	5/11/2025	12.6	27.0	1.0
	6/11/2025	11.0	26.2	0
Targeted flora survey – November	14/11/2025	14.0	25.0	0

Information from the Australia Government Bureau of Meteorology website.

Details of surveys undertaken as part of the current assessment are provided below.

Threatened flora

Targeted surveys for threatened species were undertaken by qualified ecologists Jake Schwebel, Natasha Zahra and Hugh Smylie between July and December 2025. As well as Brooke Corrigan (Senior Botanist) during multiple visits to site throughout 2024.

Survey method and effort

Targeted survey for threatened flora was undertaken over five days and included 5-10 metre separated, parallel transect searches in areas of potential habitat.

Justification of survey method and effort

Survey guidelines followed included:

- Section 5 of the BAM to determine the potential for threatened species identified under the BAM as 'ecosystem credit species' and 'species credit species' to occur (DPIE 2020a).
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (DEC 2004).
- Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method* (DPIE 2020b).
- NSW BioNet Threatened Biodiversity Data Collection*.

Timing of survey

Survey was conducted in relation to requirements in the TBDC survey guides for all candidate flora species, with the exception of Magenta Lilly Pilly (further address below).

Survey personnel and relevant experience

Targeted flora surveys were undertaken by the Biosis ecologists listed in Table 18.

Table 18 Targeted flora survey personnel and relevant experience

Staff member	Role	Relevant experience
Brooke Corrigan	Senior Botanist	Over 15 years' experience undertaking targeted flora surveys in NSW.
Jake Schwebel	Senior Botanist (Ecologist)	Over 5 years' experience undertaking targeted flora surveys in NSW.
Natasha Zahra	Botanist	Over 2 years' experience undertaking targeted flora surveys in NSW.
Hugh Smiley	Graduate Ecologist	One year's experience undertaking targeted flora surveys in NSW.

Results

Table 19 provides a summary of the results of the targeted flora surveys completed.

Table 19 Summary of targeted flora survey method and results

Species name	Common name	Survey method	Month surveyed	Survey results	Species Polygon (ha) or count
<i>Acacia pubescens</i>	Downy Wattle	Straight line parallel transects 10m apart.	July	Not recorded during surveys.	N/A
<i>Deyeuxia appressa</i>	-	Straight line parallel transects 10m apart.	December	Not recorded during surveys.	N/A
<i>Dillwynia tenuifolia</i>	-	Straight line parallel transects 10m apart.	September	Not recorded during surveys.	N/A
<i>Eucalyptus benthamii</i>	Camden White Gum	Straight line parallel transects 10m apart.	July	Not recorded during surveys.	N/A
<i>Eucalyptus glaucina</i>	Slaty Red Gum	Straight line parallel transects 10m apart.	July	Not recorded during surveys.	N/A
<i>Grevillea juniperina subsp. Juniperina</i>	Juniper-leaved Grevillea	Straight line parallel transects 10m apart.	July	Not recorded during surveys.	N/A
<i>Hibbertia puberula</i>	-	Straight line parallel transects 10m apart.	October	Not recorded during surveys.	N/A

Species name	Common name	Survey method	Month surveyed	Survey results	Species Polygon (ha) or count
<i>Hibbertia</i> sp. Bankstown	-	Straight line parallel transects 10m apart.	September	Not recorded during surveys.	N/A
<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i>	-	Straight line parallel transects 10m apart.	November	Not recorded during surveys.	N/A
<i>Maundia triglochinos</i>	-	Straight line parallel transects 10m apart.	November	Not recorded during surveys.	N/A
<i>Micromyrtus minutiflora</i>	-	Straight line parallel transects 10m apart.	July	Not recorded during surveys.	N/A
<i>Persicaria elatior</i>	Tall Knotweed	Straight line parallel transects 10m apart.	December	Not recorded during surveys.	N/A
<i>Persoonia hirsuta</i>	Hairy Geebung	Straight line parallel transects 10m apart.	October	Not recorded during surveys.	N/A
<i>Persoonia nutans</i>	Nodding Geebung	Straight line parallel transects 10m apart.	July	Not recorded during surveys.	N/A
<i>Pimelea curviflora</i> var. <i>curviflora</i>	-	Straight line parallel transects 10m apart.	October	Not recorded during surveys.	N/A
<i>Pimelea spicata</i>	Spiked Rice-flower	Straight line parallel transects 10m apart.	July	Not recorded during surveys.	N/A
<i>Pomaderris brunnea</i>	Brown Pomaderris	Straight line parallel transects 10m apart.	October	Not recorded during surveys.	N/A
<i>Pterostylis saxicola</i>	Sydney Plains Greenhood	Straight line parallel transects 10m apart.	October	Not recorded during surveys.	N/A
<i>Pultenaea parviflora</i>	-	Straight line parallel transects 10m apart.	September	Not recorded during surveys.	N/A
<i>Pultenaea pedunculata</i>	Matted Bush-pea	Straight line parallel transects 10m apart.	October	Not recorded during surveys.	N/A
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	Straight line parallel transects 10m apart.	July	Not recorded during surveys.	N/A
<i>Wahlenbergia multicaulis</i>	Tagdell's Bluebell	Straight line parallel transects 10m apart.	October	Not recorded during surveys.	N/A

Limitations

Magenta Lilly Pilly was surveyed outside of the suitable survey period described in the TBDC. However, due to the highly conspicuous nature of the species, surveys were considered suitable to reliably detect this species within the subject land. Targeted surveys were undertaken by a Senior Botanist and no other flora species similar to Magenta Lilly Pilly, such as common species Lilly Pilly *Acmena smithii*, were recorded within the subject land during surveys. The survey effort completed is considered suitable to determine the species' presence within the subject land.

Fauna habitat assessments

Fauna habitat assessment was undertaken to determine the presence of microhabitats and other critical habitat components (habitat constraints) suitable for all fauna species outlined in Table 16 and Appendix 2. Habitat assessments focussed on the presence of the following features within the subject land:

- Habitat trees including large and/or hollow-bearing trees, stick nests, availability of flowering shrubs and canopy/understorey feed tree species.
- Soil type and presence of cliffs, overhangs and other rocky areas.
- Condition and type of native vegetation and the presence of exotic species.
- Presence and condition of pools and waterways.
- Quantity of ground litter and woody debris.
- Searches for indirect evidence of fauna (i.e. feathers, tracks and scats).
- General degradation of the site as a result of past and current disturbances such as vegetation clearing and industrial land management practices.
- Topography and landscape morphology.
- Presence of flying-fox camps.

Several habitat features with potential to support threatened species credit species were identified during these habitat assessments. These features have been summarised in Table 20.

Table 20 **Habitat features with potential to support threatened species credit species**

Habitat feature	Presence within the development footprint
Hollow-bearing trees	Habitat trees supporting hollows of a variety of size classes, from small (<50 mm diameter) through to extra-large (> 400 mm diameter), were present across the subject land. These trees have the potential to provide breeding resources for a range of native fauna species including threatened cockatoos (Glossy Black-Cockatoo and Gang-gang Cockatoo), owls (Barking Owl, Masked Owl, Sooty Owl and Powerful Owl), and microbats.
Feed tree species	A variety of tree species identified as Koala use trees within the Central Coast Koala management area, which includes the subject land, were detected during the assessment. Trees and shrubs providing food resources for smaller mammals were also recorded in the development footprint, albeit in low abundance.
Caves and rocky overhangs	Although the subject land occurs on the Hawkesbury Sandstone Formation, caves and rocky overhangs were absent from the development footprint. These features likely occur in the nearby Berowra Valley and Blue Mountains National Park, which provide potential breeding habitat for threatened microbats including Large-eared Pied Bat, Little Bent-winged Bat, Large Bent-winged Bat, and Southern Myotis, as well as Masked Owls.

Habitat feature	Presence within the development footprint
Rocky outcrops and sandstone crevices	The subject land, including the Elizabeth Macarthur Creek riparian area, occurs on shale derived soils that do not support rocky outcrops or sandstone crevices.
Major and minor watercourses and waterbodies (i.e. dams)	The development footprint is intersected by one watercourse, Elizabeth Macarthur Creek, which flows along the length of the eastern boundary of the subject land. Although parts of this creek were degraded, overhanging vegetation, undercut banks, coarse woody debris, snags and other substrates were present in sections of the creek, which provide potential habitat for amphibians including Green and Golden Bell Frog. Riparian areas also have the potential to support threatened fauna species in a fragmented landscape such as the one relevant to the current project.
Woody debris and leaf litter	Woody debris and leaf litter was prevalent in the remnant vegetation patches across development footprint, providing potential habitat for the threatened Cumberland Plain Land Snail.

Field capture of detailed fauna habitat information allowed for confirmation of presence/absence of habitat features and microhabitats for a range of candidate threatened species across surveyed portions of the development footprint. Fauna habitat assessments were captured using ArcGIS polygons attributed with specific habitat criteria that allowed for planning of further targeted survey for select species, or the exclusion of the potential for occurrence of various candidate species from the subject land.

Diurnal birds

Survey method and effort

Targeted survey for diurnal birds was undertaken by qualified ecologists Jake Schwebel and Erin Parker on 15 and 16 July 2025, and 27 October 2025, over 10 person hours.

The focus of the diurnal bird survey was to determine potential nesting of Glossy Black Cockatoo and Gang-gang Cockatoo within the subject land, and to detect large stick nests within the subject land which may indicate breeding of Eastern Osprey, Little Eagle, White Bellied Sea Eagle, and Square-tailed Kite.

Justification of survey method and effort

Methods employed as part of this assessment included:

- Survey for the presence of eucalypts containing hollows that are at least 9 m above the ground, and with hollow diameter of 10 cm or larger.
- Survey for the presence of nest trees supporting large stick nests.
- Survey for the presence of living or dead eucalypt trees containing hollows greater than 5 cm diameter and greater than 4 m above the ground (or with a DBH of greater than 30 cm).
- *NSW BioNet Threatened Biodiversity Data Collection.*

Timing of survey

All surveys were undertaken in accordance with the survey requirements outlined in the TBDC.

Survey personnel and relevant experience

Nocturnal bird surveys were undertaken by the Biosis ecologists outlined in Table 21.

Table 21 Targeted diurnal bird survey personnel and relevant experience

Staff member	Role	Relevant experience
Jake Schwebel	Senior Botanist (Ecologist)	Over 5 years' experience undertaking diurnal and nocturnal bird surveys in NSW.
Erin Parker	Graduate Zoologist	Over one years' experience undertaking diurnal and nocturnal bird surveys in NSW.

Results

Table 22 provides a summary of the results of the nocturnal bird surveys completed.

Table 22 Summary of nocturnal bird survey method and results

Species name	Common name	Survey method	Dates surveyed	Survey results	Species Polygon (ha) or count
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	- Habitat searches. - Transect searches in areas with potential nest trees.	27 October 2025	Not recorded during surveys.	N/A
<i>Calyptrorhynchus lathamii lathamii</i>	South-eastern Glossy Black-Cockatoo	- Habitat searches. - Transect searches in areas of potential habitat.	15 and 16 July 2025	Not recorded during surveys.	N/A
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	- Habitat searches. - Searches for stick nests and presence/signs of breeding within the subject land.	15 and 16 July and 27 October 2025	Not recorded during surveys.	N/A
<i>Hieraaetus morphnoides</i>	Little Eagle	- Habitat searches. - Searches for stick nests and presence/signs of breeding within the subject land.	27 October 2025	Not recorded during surveys.	N/A
<i>Lophoictinia isura</i>	Square-tailed Kite	- Habitat searches. - Searches for stick nests and presence/signs of breeding within the subject land.	27 October 2025	Not recorded during surveys.	N/A
<i>Pandion cristatus</i>	Eastern Osprey	- Habitat searches. - Searches for nests and presence/signs of breeding within the subject land.	15 and 16 July and 27 October 2025	Not recorded during surveys.	N/A

Limitations

There were no limitations to the surveys described above.

Nocturnal birds

Survey method and effort

Targeted survey for nocturnal birds were undertaken by qualified ecologists Rachel Moore, Erin Parker and Courtney Kelly between 3 and 6 November 2025, over 20 person hours. Nocturnal bird surveys were

undertaken over four nights to determine whether Bush-stone Curlew is present within the subject land and observe if it is nesting on site.

Targeted survey for Barking Owl, Powerful Owl and Masked Owl was undertaken over six nights between 4 November 2025 and 11 December 2025 by qualified ecologists Rachel Moore, Tara Lillicot, Erin Parker and Courtney Kelly, over 24 person hours.

Justification of survey method and effort

Survey guidelines followed included:

- *Survey Guidelines for Australia's Threatened Birds* (DEWHA 2010a).
- *NSW BioNet Threatened Biodiversity Data Collection*.
- *Threatened Biodiversity Survey and Assessment - Guidelines for Developments and Activities* (DEC 2004).

Timing of survey

All surveys were undertaken in accordance with the survey requirements outlined in the TBDC.

Survey personnel and relevant experience

Diurnal bird surveys were undertaken by the Biosis ecologists outlined in Table 23.

Table 23 Targeted diurnal bird survey personnel and relevant experience

Staff member	Role	Relevant experience
Rachel Moore	Senior Zoologist	Over five years' experience undertaking diurnal and nocturnal bird surveys in NSW.
Tara Lillicot	Senior Zoologist	Over five years' experience undertaking diurnal and nocturnal bird surveys in NSW.
Erin Parker	Graduate Zoologist	Over one years' experience undertaking diurnal and nocturnal bird surveys in NSW.
Courtney Kelly	Graduate Ecologist	Over one years' experience undertaking diurnal and nocturnal bird surveys in NSW.

Results

Table 24 provides a summary of the results of the diurnal bird surveys completed.

Table 24 Summary of diurnal bird survey method and results

Species Name	Common name	Survey method	Dates surveyed	Survey results	Species Polygon (ha) or count
<i>Burhinus grallarius</i>	Bush Stone-curlew	• Habitat searches. • Transect searches through areas of suitable habitat. • Spotlighting over 4 nights.	3 - 6 November 2025	Not recorded during surveys.	N/A

Species Name	Common name	Survey method	Dates surveyed	Survey results	Species Polygon (ha) or count
<i>Ninox connivens</i>	Barking Owl	Call playback and spotlighting over 6 nights.	4-6 November 2025 9-11 December 2025	Not recorded during surveys.	N/A
<i>Ninox strenua</i>	Powerful Owl	Call playback and spotlighting over 6 nights.	4-6 November 2025 9-11 December 2025	Not recorded during surveys.	N/A
<i>Tyto novaehollandiae</i>	Masked Owl	Call playback and spotlighting over 6 nights.	4-6 November 2025 9-11 December 2025	Not recorded during surveys.	N/A

Limitations

There were no limitations to the surveys described above.

Frogs

Survey method and effort

Targeted survey for Green and Golden Bell Frog was undertaken by qualified ecologists Rachel Moore, Erin Parker and Courtney Kelly between 3 and 6 November 2025 July 2025, over 20 person hours. Detailed habitat assessment was undertaken within the subject land considered to potentially provide habitat for this species.

Nocturnal surveys were undertaken over four nights at all suitable habitat areas, including seasonally wet areas and permanent water bodies within the subject land, including Elizabeth Macarthur Creek. Surveys involved:

- Call playback undertaken every 50 m of a 500 m transect along Elizabeth Macarthur Creek.
- Visual searches undertaken within each call playback point.

Justification of survey method and effort

Survey guidelines followed included:

- *Survey Guidelines for Australia's Threatened Frogs* (DEWHA 2010b).
- *NSW Survey Guide for Threatened Frogs: A Guide for the Survey of Threatened Frogs and their Habitats for the Biodiversity Assessment Method* (DPIE 2020c).
- *Significant Impact Guidelines for the Vulnerable Green and Golden Bell Frog (*Litoria aurea*)* (DEWHA 2009).
- *Environmental Impact Assessment Guideline: Green and Golden Bell Frog* (NPWS 2003).
- *NSW BioNet Threatened Biodiversity Data Collection*.

Timing of survey

All surveys were undertaken in accordance with the survey requirements outlined in the TBDC.

Survey personnel and relevant experience

Frog surveys were undertaken by the Biosis ecologists outlined in Table 25.

Table 25 Targeted frog survey personnel and relevant experience

Staff member	Role	Relevant experience
Rachel Moore	Senior Zoologist	Over five years' experience undertaking frog surveys in NSW.
Erin Parker	Graduate Zoologist	Over one years' experience undertaking frog surveys in NSW.
Courtney Kelly	Graduate Ecologist	Over one years' experience undertaking frog surveys in NSW.

Results

Table 26 provides a summary of the results of the frog surveys completed.

Table 26 Summary of frog survey method and results

Species name	Common name	Survey method	Dates surveyed	Survey results	Species Polygon (ha) or count
<i>Litoria aurea</i>	Green and Golden Bell Frog	- Habitat searches. - Call playback and spotlighting at 50 m intervals along transects in suitable habitat (4 nights). 3-6 November 2025.	3 - 6 November 2025	Not recorded during surveys.	N/A

Limitations

There were no limitations to the surveys described above.

Invertebrates

Survey method and effort

Targeted survey for Cumberland Plain Land Snail was undertaken by qualified ecologists Rachel Moore, Erin Parker and Courtney Kelly on 15 and 16 July 2025, and between 3-6 November 2025, over 20 person hours. Active searches for live snails were undertaken in suitable habitat such as beneath leaf litter, at the base of trees and any other shelter sites that may be present within the subject land.

Survey methodology utilised by Biosis for threatened Snails is adapted from the Spot Assessment Technique (SAT) (Phillips & Callaghan 2011). A central feature is chosen (particularly Forest Red Gum, woody debris and sheets of bark, rubbish and rock), and a search undertaken in around the feature, including scratching the surface of leaf litter, lifting rocks and looking under logs and debris.

Spotlighting for Cumberland Plain Land Snail was also completed via meandering transects across suitable habitat (associated PCTs) at a very slow walking pace, spotlighting the ground and other low objects for active snails. Survey locations focussed on targeting the habitat features outlined for diurnal survey.

Justification of survey method and effort

Survey guidelines followed included:

- *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (DEC 2004).
- *NSW BioNet Threatened Biodiversity Data Collection*.
- *Environmental impact assessment guidelines: Cumberland Plain Large Land Snail* (NPWS 2000).

Timing of survey

All surveys were undertaken in accordance with the survey requirements outlined in the TBDC.

Survey personnel and relevant experience

Invertebrate surveys were undertaken by the Biosis ecologists outlined in Table 27.

Table 27 Targeted invertebrate survey personnel and relevant experience

Staff member	Role	Relevant experience
Rachel Moore	Senior Zoologist	Over four years' experience undertaking invertebrate surveys in NSW.
Erin Parker	Graduate Zoologist	Over one years' experience undertaking invertebrate surveys in NSW.
Courtney Kelly	Graduate Ecologist	Over one years' experience undertaking invertebrate surveys in NSW.

Results

Table 28 provides a summary of the results of the invertebrate surveys completed.

Table 28 Summary of invertebrate survey method and results

Species name	Common name	Survey method	Dates surveyed	Survey results	Species Polygon (ha) or count
<i>Meridolum corneovirens</i>	Cumberland Plain Land Snail	• Modified SAT surveys • Nocturnal spotlight searches	15 and 16 July 2026 (diurnal), 3-6 November 2025 (nocturnal)	Not recorded during surveys.	N/A

Limitations

There were no limitations to the surveys described above.

Mammals

Survey method and effort

Targeted survey for Eastern Pygmy Possum, Greater Glider, Squirrel Glider and Koala was undertaken by qualified ecologists Rachel Moore, Erin Parker and Courtney Kelly between 15-16 July 2025, and 3-6 November 2025, over 30 person hours.

Koala Spot Assessment Techniques (SAT) surveys were undertaken to detect presence and use of feed trees within the subject land between 15 and 16 July 2025. Additional nocturnal surveys for mammals was undertaken over four nights in all suitable habitat areas within the subject land, which involved spotlighting over a 500 m transect along Elizabeth Macarthur Creek.

Justification of survey method and effort

Survey guidelines followed included:

- *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities.*
- *Koala (Phascolarctos cinereus) Biodiversity Assessment Method Survey Guide*
- *Survey Guidelines for Australia's Threatened Mammals.*

Timing of survey

All surveys were undertaken in accordance with the survey requirements outlined in the TBDC.

Survey personnel and relevant experience

Terrestrial and arboreal mammal surveys were undertaken by the Biosis ecologists outlined in Table 29.

Table 29 Targeted mammal survey personnel and relevant experience

Staff member	Role	Relevant experience
Rachel Moore	Senior Zoologist	Over four years' experience undertaking mammal surveys in NSW.
Erin Parker	Graduate Zoologist	Over one years' experience undertaking mammal surveys in NSW.
Courtney Kelly	Graduate Ecologist	Over one years' experience undertaking mammal surveys in NSW.

Results

Table 30 provides a summary of the results of the mammal surveys completed.

Table 30 Summary of mammal survey method and results

Species name	Common name	Survey method	Dates surveyed	Survey results	Species Polygon (ha) or count
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	• Spotlighting across 500 m transect • Habitat assessment	3-6 November 2025	Not recorded during surveys.	N/A
<i>Petaurus norfolcensis</i>	Squirrel Glider	• Spotlighting across 500 m transect • Habitat assessment	3-6 November 2025	Not recorded during surveys.	N/A
<i>Petauroides volans</i>	Greater Glider	• Spotlighting across 500 m transect • Habitat assessment	3-6 November 2025	Not recorded during surveys.	N/A

Species name	Common name	Survey method	Dates surveyed	Survey results	Species Polygon (ha) or count
<i>Phascolarctos cinereus</i>	Koala	- Spotlighting across 500 m transect - Koala SAT surveys - Habitat assessment	15-16 July 2025 3-6 November 2025	Not recorded during surveys.	N/A

Limitations

There were no limitations to the surveys described above.

Microbats

Survey method and effort

Targeted survey for threatened microbat species Southern Myotis was undertaken by qualified ecologists Rachel Moore, Erin Parker and Courtney Kelly between 11 and 15 December 2025.

Surveys included the deployment of four ultrasonic detectors in the subject land over four nights, with the total survey effort of 16 trap nights sufficient to meet the survey requirements. Units were placed in a position that maximised the likelihood of recording bats in accordance with the applicable guidelines (along waterways and in flyways).

Justification of survey method and effort

Survey guidelines followed included:

- ‘Species credit’ threatened bats and their habitats NSW guide for the Biodiversity Assessment Method (DPIE 2021)
- Survey Guidelines for Australia’s Threatened Bats: Guidelines for detecting bats listed as threatened under Environment Protection and Biodiversity Conservation Act 1999 (DEWHA 2010c).

Timing of survey

All surveys were undertaken in accordance with the survey requirements outlined in the TBDC.

Survey personnel and relevant experience

Microbat surveys were undertaken by the Biosis ecologists outlined in Table 31.

Table 31 Targeted microbat survey personnel and relevant experience

Staff member	Role	Relevant experience
Rachel Moore	Senior Zoologist	Over five years’ experience undertaking mammal surveys in NSW.
Erin Parker	Graduate Zoologist	Over one years’ experience undertaking mammal surveys in NSW.
Courtney Kelly	Graduate Ecologist	Over one years’ experience undertaking mammal surveys in NSW.

Results

Table 32 provides a summary of the results of the microbat surveys completed.

Table 32 Summary of microbat survey method and results

Species name	Common name	Survey method	Dates surveyed	Survey results	Species Polygon (ha) or count
<i>Myotis macropus</i>	Southern Myotis	Ultrasonic acoustic detectors	11-15 December 2025	Species detected during targeted surveys.	5.14

Limitations

There were no limitations to the surveys described above.

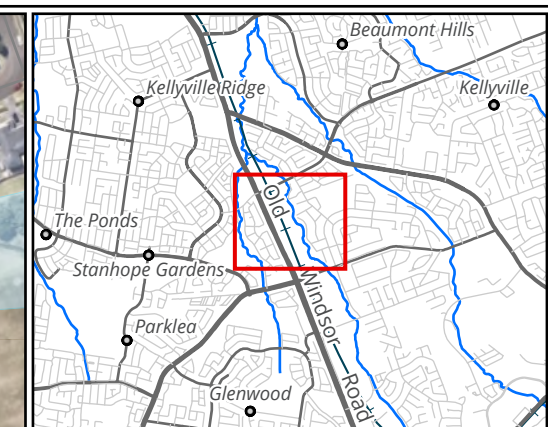
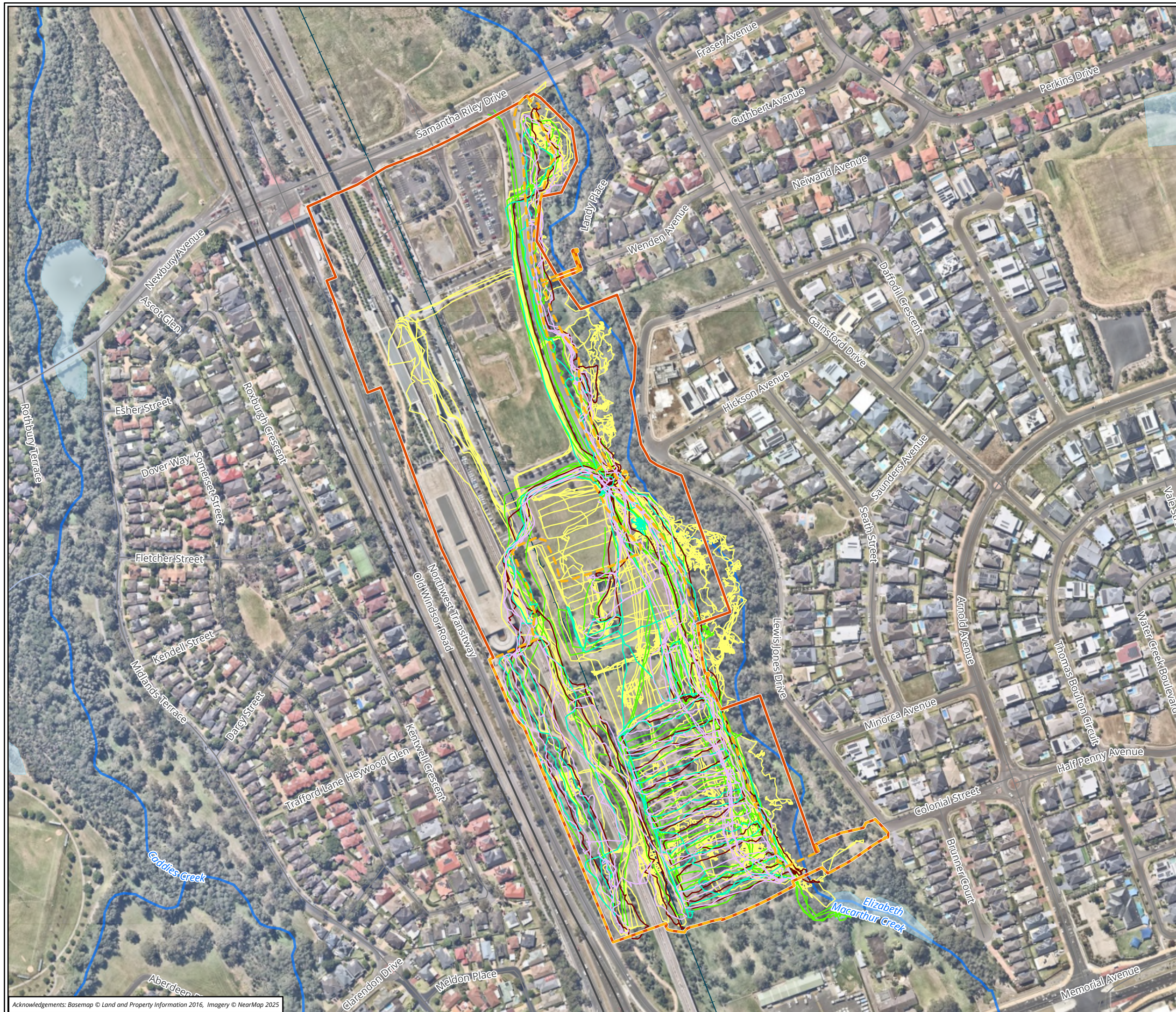
4.2.2 Incidental flora and fauna surveys

A number of threatened microbat species were recorded incidentally within the subject land during field investigations. The microbat species listed below were detected based on the type, number and duration of calls recorded using acoustic detectors during targeted surveys for Southern Myotis.

- Eastern Cave Bat *Vespadelus troughtoni* (Vulnerable, BC Act).
- Eastern Coastal Free-tailed Bat *Micronomus norfolkensis* (Vulnerable, BC Act).
- Eastern False Pipistrelle *Falsistrellus tasmaniensis* (Vulnerable, BC Act).
- Greater Broad-nosed Bat *Scoteanax rueppellii* (Vulnerable, BC Act).
- Large Bent-winged Bat *Miniopterus orianae oceanensis* (Vulnerable, BC Act).
- Little Bent-winged Bat *Miniopterus australis* (Vulnerable, BC Act).

Although Eastern Cave Bat, Little Bent-wing Bat and Large Bent-wing Bat were detected during survey, no suitable roost features were identified within the development site by field investigation. These species are species credit species for breeding habitat only, and therefore no further assessment or species polygons are required.

Three threatened ecosystem credit species, Eastern Coastal Free-tailed Bat, Eastern False Pipistrelle and Greater Broad-nosed Bat were recorded during surveys. As impacts to these species are offset through ecosystem credits, no further assessment or species polygons are required.



Legend

- Subject land
- Development footprint

Flora survey tracks

- December 2025
- November 2025
- October 2025
- September 2025
- July 2025

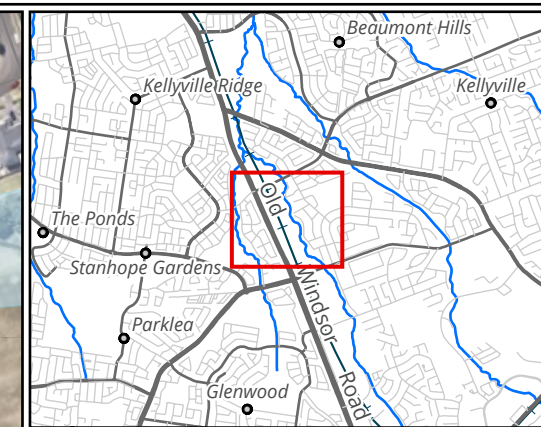
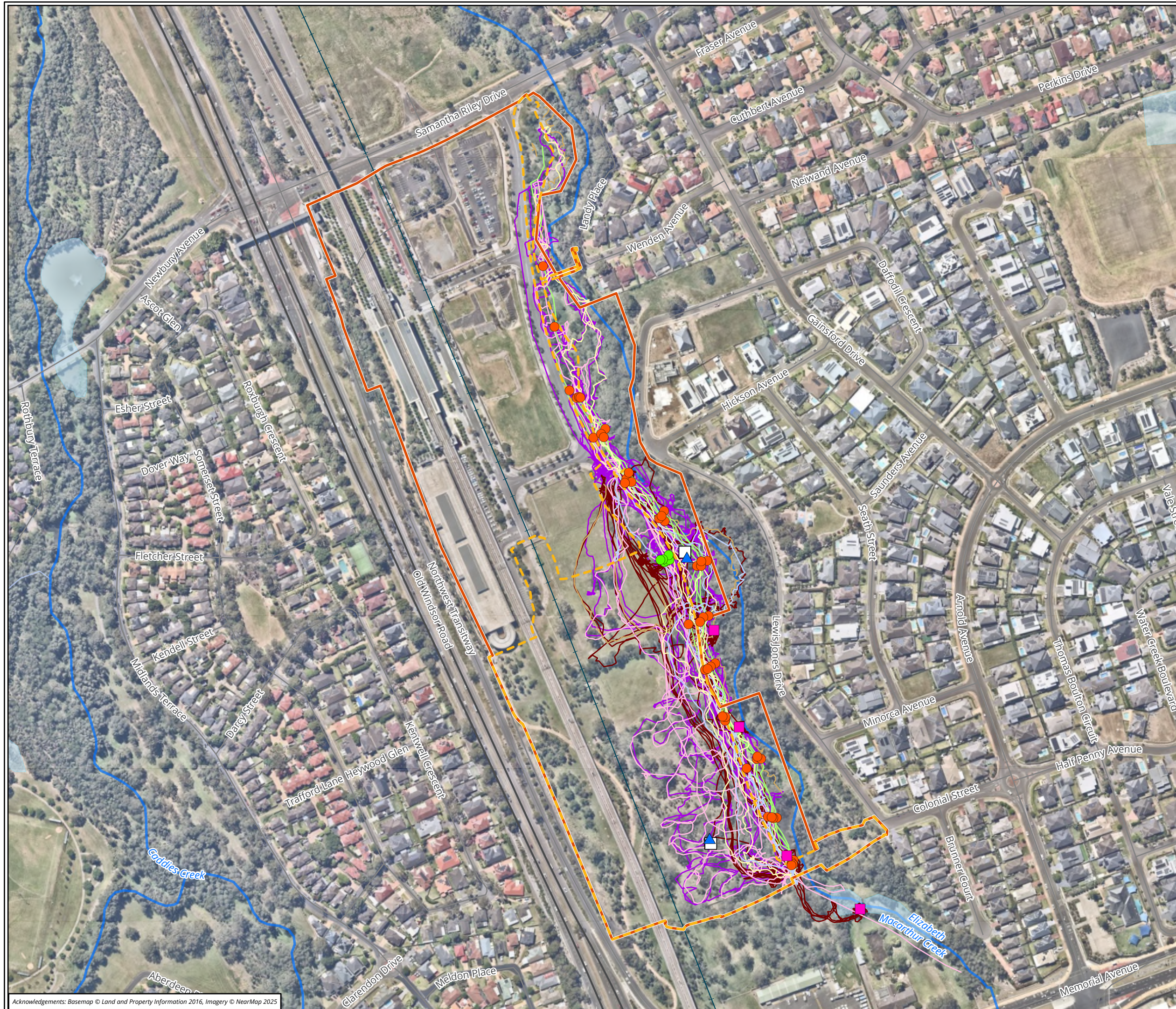
Figure 9.1 Targeted fauna/ flora species - Flora



Scale: 1:3,500 @ A3
Coordinate System: GDA2020 MGA Zone 56



Matter: 40523, Date: 03 February 2026,
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyvilleSP_BDAR.aprx
Layout: 40523_F9_1_TrgSpec



- Legend**
- Subject land
 - Development footprint
- Fauna surveys**
- Large Forest Owls call playback
 - Green and Golden Bell Frog call playback
 - Koala SAT survey
 - Cumberland Plain Land Snail modified SAT survey
 - Southern Myotis anabat
- Fauna line survey**
- Microbat survey
 - Mammal spotlighting
 - Bird survey
 - Frog spotlighting
 - Snail spotlighting
- Fauna survey tracks**
- November 2025
 - December 2025

Figure 9.2 Targeted fauna/ flora species - Fauna

0 50 100 150 Metres

Scale: 1:3,500 @ A3

Coordinate System: GDA2020 MGA Zone 56

biosis
APEM Group

Matter: 40523, Date: 03 February 2026,
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyvilleSP_BDAR.aprx
Layout: 40523_F9_2_TrgSpec

4.2.3 Local data

No local data was used as part of the current assessment.

4.2.4 Expert reports

No expert reports were utilised for the current assessment.

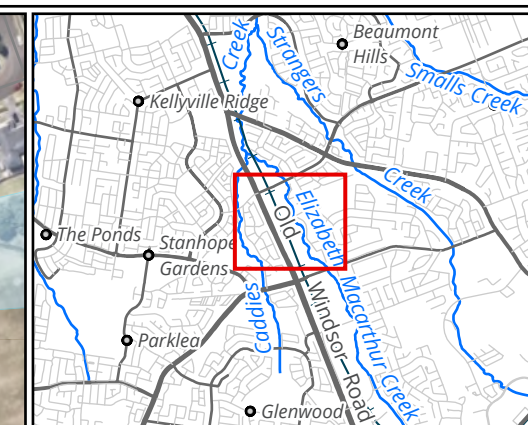
4.2.5 Threatened species summary and polygons

Table 33 provides details of threatened species impacted by the project and outlines the attributes that comprise the threatened species polygons.

The presence of threatened species impacted by the project is illustrated in Figure 10.

Table 33 Threatened species polygons within the development footprint

Threatened species	Impact (ha)	Unit of measure	Biodiversity risk weighting	Polygon attributes
Fauna				
Southern Myotis <i>Myotis macropus</i>	5.14	Area	2.00	All associated PCTs within the development footprint that occur within 200 m of a watercourse at least 3 m wide.



Legend

- Subject land
- Development footprint
- Southern Myotis - *Myotis macropus* species polygon

Figure 10 Threatened species polygon - Southern Myotis



Metres

Scale: 1:3,500 @ A3

Coordinate System: GDA2020 MGA Zone 56



Matter: 40523, Date: 03 February 2026,
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyvilleSP_BDAR_Part2.aprx
Layout: 40523_F10_ThrSpPoly

Stage 2 — Impact assessment (Biodiversity Values)

5 Avoid and minimise impacts

This section demonstrates the efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with BAM, including an analysis of alternatives:

- Modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology.
- Routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route.
- Alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location.
- Alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site.
- Efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design.
- Site constraints that have been considered in determining the location and design of the proposed development.

5.1 Kellyville SP project location considerations

Site selection for Kellyville SP was informed by strategic planning approaches for the Sydney region, which prioritise growth centres around support infrastructure to meet a range of commitments. A level of unavoidable impacts to biodiversity values will occur in order to achieve these objectives, as a result of the considerations described below:

- In August 2014, the NSW Government endorsed Council's nomination for Kellyville and Bella Vista to become Planned Precincts as a means of implementing the land use and transport planning strategies identified in the North West Rail Link (NWRL) Corridor Strategy (2013). Key objectives of the Planned Precinct program and NWRL Corridor Strategy were to provide new housing and jobs in centres with good transport connections to improve travel efficiency and to ensure that supporting infrastructure is provided to meet predicted housing and employment demands.
- Kellyville and Bella Vista Station Precincts were identified to accommodate the housing and employment demands outlined in the NSW Government's A Plan for Growing Sydney (2014). Prior to initial project design, both precincts were investigated by qualified ecologists to assess the biodiversity and riparian values as part of the broader precinct planning/rezoning process, including lands within the boundary of each concept SSD application site. The assessments identified areas of ecological value that should be retained and protected and identified areas of likely impact, which in turn informed the draft rezonings and accompanying precinct structure plans that were exhibited between 7 December 2015 and 28 February 2016.
- At the time, the Office of Environment and Heritage (now NSW DCCEW) advised it supported the use of E2 Environmental Conservation zones for areas of high ecological constraint values that were to be retained. The Department noted in its Precinct Finalisation Reports, that:
 - Most of the mapped ecological communities occurred within riparian corridors that would retain their existing RE1 Public Recreation or SP2 Infrastructure land use zoning.

- Future development would need to minimise potential Cumberland Plain Woodland impacts and conditions of consent may be required to mitigate against potential ecological impacts.
- Future development control plans should incorporate provisions to ensure vegetation impacts were minimised and mitigated.
- On 1 December 2017, the Kellyville and Bella Vista Station Precincts were subsequently rezoned when the then Minister for Planning approved State Environmental Planning Policy Amendment (Bella Vista and Kellyville Station Precincts) 2017 that amended State Environmental Planning Policy (State and Regional Development) 2011 (Now Schedule 2 of the Planning Systems SEPP) and The Hills LEP.
- The approved rezonings were made on the basis that both station precincts carried significant strategic merit and would:
 - Maximise the use of the SMNW and other public transport infrastructure.
 - Provide more jobs closer to homes, promote public transport to employment areas, whereby reducing the need for private vehicle trips.
 - Respond to the strong current and future predicted demand for additional employment and housing.
- The approved rezonings and proposed urbanisation of both precincts strongly align with the Greater Sydney Commission's housing and employment targets for The Hills Shire as set out in its Central City District Plan and associated priorities and actions. This includes the priority of accommodating the predicted growth demand of 207,500 dwellings across the district by the year 2036.
- Furthermore, much of this strategic intent has continued through the more recent recognition and planning reform of the precincts within the Transport Orientated Development program.
- The retention of remnant Cumberland Plain Woodland patches outside of the riparian corridors and existing RE1 zoned land would compromise the NSW Government's priorities and actions for the Central City District from being realised. Areas of Cumberland Plain Woodland and other areas of native vegetation are proposed to be retained within planned open space areas and other site locations where their retention is practical.

The reasoning for site selection and the limited opportunity for further reduction of impacts to remnant native vegetation, beyond the works completed to maximise the avoidance and minimisation of impacts (outlined herein), including the Cumberland Plain Woodland CEEC, is outlined below:

- The proposed site for the Kellyville SP was reviewed by technical experts, which informed both the Structure Plans and the rezoning of the site. This plan proposed that development would need to occur in areas containing remnant vegetation.
- The site was rezoned by DPHI due to opportunities for housing and employment.
- Further retention of biodiversity values would not align with the targets and priorities for the precinct.
- The Cumberland Plain Woodland CEEC (and the associated Cumberland Plain Shales Woodland CEEC, listed under the EPBC Act) will be retained within open space areas proposed as part of the Concept Plan.
- Trees that form part of the Cumberland Plain Woodland CEEC and the associated Cumberland Plain Shales Woodland CEEC will be investigated for retention within Lots and Parks proposed as part of the Concept Plan.
- All impacts to native vegetation, including the Cumberland Plain Woodland CEEC, will be offset via the purchase of credits.

5.2 Actions to avoid/minimise project impacts

Actions to avoid and minimise project impacts were undertaken where possible throughout the project; however, the project location, layout and design was determined through strategic assessment and guided by the Concept Plan (and location proximal to the SMNW rail line), which was developed in accordance with the NSW Government's housing and employment targets for the Kellyville SP.

The principles in Section 7 of the BAM were applied to avoid and minimise impacts on native vegetation and habitat (where practical) through the project masterplan development process, as described in Table 8.1 of the Concept Plan BDAR (Eco Logical Australia 2020a). This was achieved by avoiding and minimising impacts within high biodiversity values and other areas of native vegetation and fauna habitat within the subject land, including areas of moderate condition River-flat Eucalypt Forest EEC within the riparian corridor, where possible.

As the proposed works and associated development footprint was determined by the Concept Plan for the precinct and overall objectives of the NSW Government, alternative footprints within the subject land were not considered as part of this BDAR.

Advice received from Council (09 March 2026) stated that, "for the Kellyville Precinct approximately 10 % additional impacts will occur to TECs, compared to the SSDA Concept Approval, and on this basis Council's Ecology Section are of the view the application will have a Serious and Irreversible Impact, and has not taken all reasonable measures to avoid impacts to the TECs".

It is acknowledged that minor increases to impacts will occur (equating to 0.39 hectares or 8 %, see Table 34 below) in certain areas of the development footprint as a result from the project, over and above those included in the Concept Plan BDAR. These impacts are required as a result of further and more detailed design work to deliver the Approved Concept Plan for the Kellyville SP, as well as inconsistencies between the Approved Concept Plan and the Concept Plan BDAR. Required updates to project design, landscape design and civil engineering design, have resulted in the following:

- A requirement for battering and/or retaining walls along the eastern side of the project footprint to support the extension of the roadway (Decora Drive) south for access through the future urban areas, as per the Approved Concept Plan design. These area of associated required civil earthworks were not considered in the Concept Plan BDAR.
- Construction of a pedestrian bridge from Decora Drive to Landy Place, which is included in the Approved Concept Plan, but not the Concept Plan BDAR.
- Re-alignment of the access road (Road 01) at the southern extent of the future urban area to allow for the road bridge to tie into Colonial Street. The alignment of the roadway in the Approved Concept Plan could not be constructed within the footprint allowed for in the Concept Plan BDAR. In order to maintain a straight line onto and across the bridge, additional support in the form of batters or retaining walls was required, which increases the overall impact footprint south, outside the area included in the Concept Plan BDAR.
- Further design of support structures (battering) required for the road bridge to Colonial Street. The Concept Plan BDAR only allowed for the width of the roadway, however additional width is required for the support structures.
- The requirement for a small roadway tie-in in the south-western corner of the development footprint required to satisfy Transport for NSW requirements.

Further to the detailed design driven changes to the project's impacts (required to deliver the Approved Concept Plan), environmentally driven changes have also resulted in differences between impacts included in the Concept Plan BDAR and the current assessment. Variations from biodiversity values mapped in preparation of the Concept Plan BDAR and the current assessment, and context for these changes, include:

- Landscape plantings have been installed and/or undergone an establishment period within the Sydney Metro Northwest (SMNW) corridor.
 - Small areas of Cumberland Plain Woodland outside of the Kellyville SP perimeter fence have existing understorey landscaping and managed open space grassland.
 - Areas previously part of the SMNW construction footprint now contain planted native vegetation or exotic grassland.
- Some areas previously mapped as exotic vegetation now contain a component of native species and could be assigned to a PCT and low or derived native grassland condition class. This transition was typically observed where cleared areas adjoin moderate condition native vegetation.
 - Survey for the Concept Plan BDAR was undertaken in 2018/2019 during a period of extremely hot and dry conditions associated with extensive fires in eastern Australia, limiting the capacity for soft grasses and forbs to persist in open, exposed habitat.
 - Climatic conditions in recent years, particularly 2021/2022 have been of above average rainfall and comparatively mild summer temperatures. Supporting the establishment of soft groundcover species and juvenile trees and shrubs.
 - Assessment undertaken in the Concept Plan BDAR is consistent with BAM 2017 guidelines.
- Some isolated small trees previously mapped as native vegetation have since died, most likely as the result of natural processes such as disease.

Further to the above, the Concept Plan BDAR (EcoLogical 2020a) allows for the clearance of planted vegetation that meets the BC Act listing requirements of Cumberland Plain Woodland within the northern portion of the subject land. The current project is not proposing to impact this vegetation and as such this can be considered avoidance of 1.43 hectares of (planted) CEEC listed vegetation.

Following submission of the DA, and subsequent feedback from Council around the need to further explore options to avoid and minimise impact to biodiversity values, the proponent has undertaken further efforts to reduce the level of increased impacts between the Concept Plan BDAR and the current assessment. This included multiple project team design workshops between civil engineers, landscape architects, arborists and ecologists to interrogate areas of increased impacts and opportunities to reduce those impacts. The outcomes of these workshops include:

- Relocation the shared pathway that runs along the riparian corridor reducing impacts to PCT 4025 / River-flat Eucalypt Forest EEC, and regeneration of the retained areas of vegetation.
- Substitution of supporting batters for retaining walls at strategic locations along the riparian corridor to reduce the direct impact footprint of the engineering works required to support the extension of Decora Drive.
- Substitution of supporting batters for a retaining wall along the southern extent of the development footprint to minimise impacts associated with the road realignment tying into the Colonial Street road bridge.
 - The use of retaining walls and/or vegetated supportive batters was guided by the following engineering principles:
 - No retaining walls over 3m (Council / WHS requirement)
 - 5 m setback (easement) behind retaining walls for construction/maintenance (Council requirement)

- Batters (where retaining wall not feasible) are 3:1 as per the concept design.
- Reducing the roadway tie-in in the south-western corner of the development footprint to the minimum 5 m length requirement.
- Correction of a handful of discrepancies between the civil engineering design and the BDAR provided with the DA, reducing impacts in number of locations.

Design refinements completed post DA submission to address Council feedback has resulted in a reduction in impacts to BC Act and EPBC Act listed River-flat Eucalypt Forest EEC from 1.4 hectares to 1.19 hectares (approximately a 15 % reduction in impacts), and an associated reduction in confirmed Southern Myotis habitat from 5.22 hectares to 5.14 hectares. The overall reduction in impacts to native vegetation equates to 0.1 hectares (rather than the 0.21 hectares of River-flat Eucalypt Forest EEC noted above), due to a small misalignment in the previous BDAR's development footprint and the relevant civil drawings, increasing impacts to planted Cumberland Plain Woodland CEEC (BC Act only) by 0.11 hectares. It should be noted that this planted Cumberland Plain Woodland is of such low ecological condition that it does not trigger offsets under the BC Act or EPBC Act.

Plate 1 (provided by Council) and Plate 2 (updated for the current assessment) compare changes in unavoidable impacts between the Concept Plan BDAR, and the current assessment. Areas in yellow are proposed to be avoided in the current applications (Plate 1 initial DA, Plate 2 post-DA updates) and the areas in blue were previously avoided under the Concept Plan Approval. Area with a blue hatch with no yellow over the top are additional unavoidable impacts under the current applications in comparison to the Concept approvals.



Plate 1 Council analysis of SSDA avoidance (blue hatching) and DA avoidance (yellow hatching)

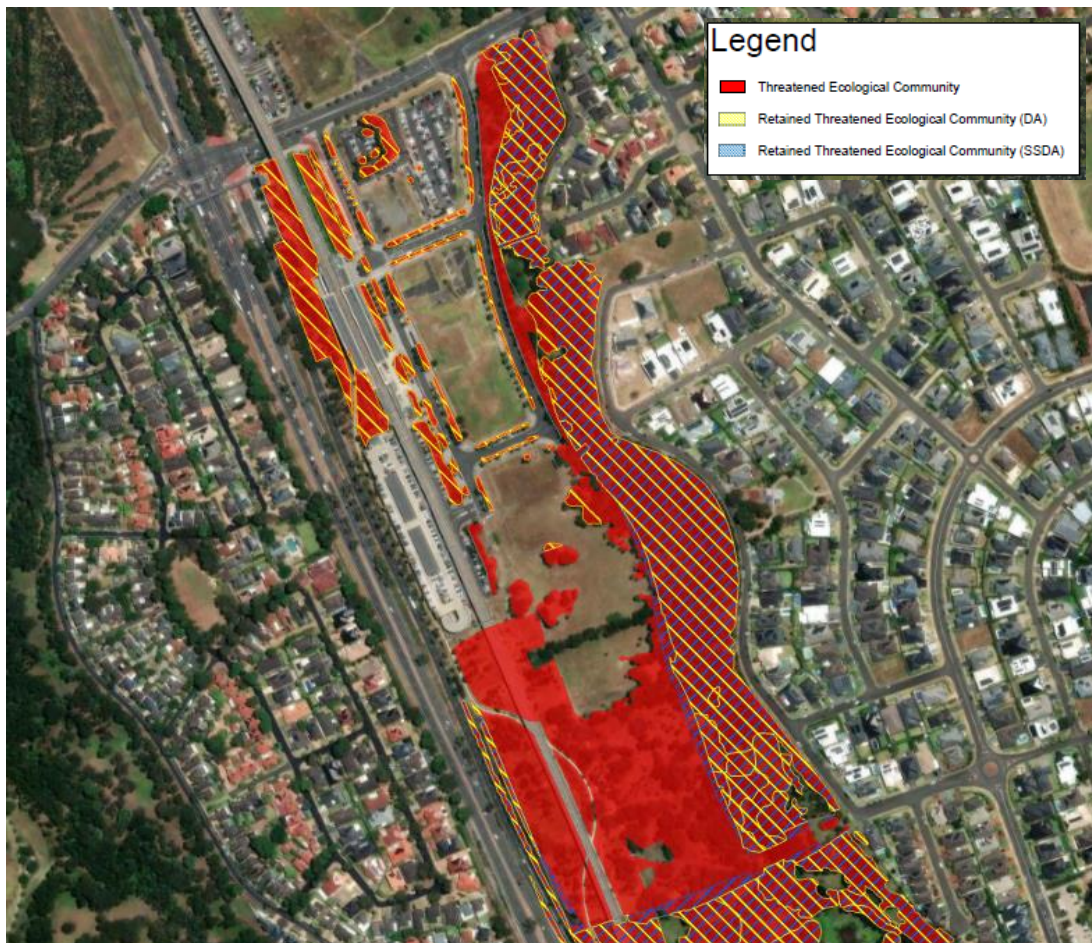


Plate 2 Post DA updated avoidance

It can be seen from Plate 1 and Plate 2 above that following the updated post-DA design, there remains substantial areas of avoided biodiversity values (mapped in red, with yellow hatching) surrounding the development footprint on all sides, including along the riparian corridor, which will retain connectivity under the proposed bridges. There will be some areas of impact additional to the SSDA approval (blue hatching only), around the edges of the development footprint, however these areas have been reduced and minimised to the fullest extent possible between the initial DA submission and the current updated application.

Table 34 below provides a comparison of BC Act listed TEC impacts (outlined above) between Concept Plan BDAR and current BDAR. Impacts presented are considered the residual unavoidable impacts following efforts outlined above to avoid and minimise to the fullest extent, and required to deliver the Approved Concept Plan.

Table 34 Comparison BC Act TEC impacts between Concept Plan BDAR and current BDAR

Concept Plan BDAR			Current assessment			
PCT	Condition	Impacts (Ha)	PCT	Condition	Impacts (Ha)	Change (ha)
Cumberland Plain Woodland - BC Act						
849	Moderate, Degraded	2.05	3320	Moderate, Low	2.22	0.17
	Landscape Plantings	2.1		Planted	1.96	-0.14
Total		4.15			4.18	0.03
River-flat Eucalypt Forest - BC Act						
835	Moderate	0.75	4025	Moderate, Low	0.77	0.02
	Revegetated	0.07		Planted	0.42	0.35
Total		0.82			1.19	0.37
Freshwater Wetlands - BC Act						
1071	Freshwater Wetlands	0.05	3975	Moderate	0.04	-0.01
Total		0.05			0.04	-0.01
Total TEC impacts		5.02			5.41	0.39

It is acknowledged that there is an increase to BC Act listed TECs in general, comprising Cumberland Plain Woodland and River-flat Eucalypt Forest, of 0.39 hectares or 8 %, between the Concept Plan and the current assessment, however the justification for these unavoidable increases are detailed above.

The above efforts to further avoid and minimise increased impacts to biodiversity values between the Concept Plan BDAR and the current project footprint have exhausted available opportunities to do so, whilst maintaining the project's housing delivery objectives. As such, residual impacts are considered unavoidable and the BC Act Avoid, Minimise and Offset hierarchy has been implemented to the fullest extent possible for the design and approvals phase of the project. Further opportunities to apply the hierarchy during construction and operation outlined in Table 35 and Table 40 below.

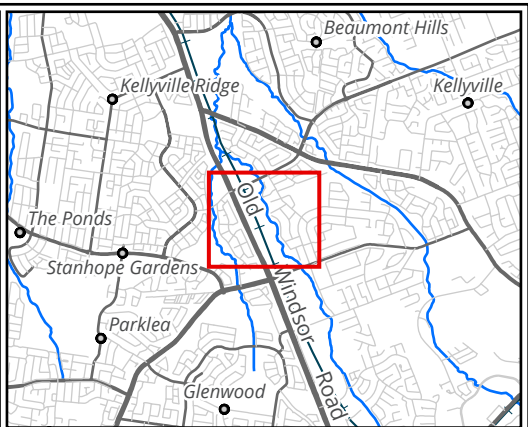
Figure 11 shows the final development footprint, with Figure 12(a,b,c) further illustrating a comparison between the Concept Plan BDAR (SSDA) impacts, the original DA impacts, and the current (post-DA) impacts. The final development footprint proposed (including construction and operation) as well as demonstrating prescribed impacts and indirect impact zones where applicable is shown in Figure 13.

Table 35 Avoidance and minimisation of impact

Avoidance and minimisation components	Action	Outcome	Timing	Responsibility
<i>Modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology.</i>	Removal of hollow-bearing trees that have the potential to support habitat for fauna species is to be completed under the supervision by a suitably qualified ecologist, utilising the following procedure: - Prior to vegetation removal, hollow-bearing trees should be inspected and knocked to encourage resident fauna to evacuate the tree. - All vegetation surrounding the hollow-bearing tree should then be cleared and grubbed. - Hollow-bearing trees to be inspected immediately prior to removal (24 to 48 hours following vegetation clearance), by a qualified ecologist.	Avoids any direct impacts to fauna utilising habitat features during clearing.	Prior to clearing of vegetation.	Sydney Metro / Landcom Consulting ecologist
	The use of underboring technology to construct a sewer main connection within the Elizabeth Macarthur Creek riparian corridor, which has reduced the requirements for the clearing of native vegetation to the underbore receival pit, at an existing manhole (refer Figure 11, and Figure 15).	Avoids vegetation clearing along the 59 m long underbore.	During project planning	Sydney Metro / Landcom Civil design team
<i>Alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location</i>	The location of the Kellyville SP was determined through strategic assessment, and the site layout has been developed in accordance with the NSW Government's housing and employment targets for the station precincts.	- Reduction in impacts to higher quality native vegetation and habitat, notably the moderate condition River-flat Eucalypt Forest EEC and Freshwater Wetlands EEC along Elizabeth Macarthur Creek. - Avoids fragmentation of connectivity corridors.	Prior to commencement of the proposed works.	Sydney Metro / Landcom Consulting ecologist
<i>Alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site.</i>	Although efforts to avoid and minimise impacts were restricted, the proposed works will utilise areas containing exotic groundcover or cleared land, or native vegetation in poorer condition (PCT 3320 Landscape Plantings), to reduce total impacts to higher quality native vegetation near Elizabeth Macarthur Creek. The position of the development footprint will result in the avoidance of 1.94 ha of River-flat Eucalypt Forest, 0.11 ha of Freshwater Wetlands and 1.57 ha of Cumberland Plain Woodland TECs within the riparian corridor. Further avoidance of the Cumberland Plain Woodland CEEC could not be undertaken while still meeting the targets for the precinct.			

Avoidance and minimisation components	Action	Outcome	Timing	Responsibility
<i>Efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design.</i>	Areas of biodiversity value could not be entirely avoided without compromising the NSW Government's priorities and actions for the area. The development footprint has been designed to avoid the majority of the vegetation within the riparian corridor, in order to prioritise the retention of higher condition vegetation, which will be managed for biodiversity through implementation of a VMP post-approval. Further opportunities to retain and rehabilitate native vegetation within planned open span areas will also be undertaken, where possible.	- Reduction in impacts to connectivity supported by higher quality native vegetation and habitat, notably the moderate condition River-flat Eucalypt Forest EEC along Elizabeth Macarthur Creek. - Potential additional retention and rehabilitation of native vegetation within open space areas. - Regeneration of the retained areas of vegetation within the riparian corridor and management via a VMP.	Prior to commencement of the proposed works.	Sydney Metro / Landcom Consulting ecologist
<i>Site constraints that have been considered in determining the location and design of the proposed development.</i>	Key ecological constraints within the subject land include the TECs, and habitat features that have the potential to be utilised by locally occurring fauna, including threatened species. However, the location and design of the development was determined through strategic assessment and guided by the concept plan. The development footprint has been positioned in cleared or exotic groundcover areas where possible, to minimise impacts to TECs within the subject land, particularly the River-flat Eucalypt Forest EEC in moderate condition. Impacts to Cumberland Plain Woodland could not be further reduced while still achieving the required targets for housing and employment to be provided by the precinct. Impacts to biodiversity values will be offset in accordance with Section 9.1 of this BDAR, with additional opportunities for Cumberland Plain Woodland within the development footprint to be retained and rehabilitated in open space areas and streetscape.	- Reduction in impacts to higher quality native vegetation and habitat, notably the moderate condition River-flat Eucalypt Forest EEC along Elizabeth Macarthur Creek. - Potential additional retention and rehabilitation of native vegetation within open space areas.	Prior to commencement of the proposed works.	Sydney Metro / Landcom Consulting ecologist

Avoidance and minimisation components	Action	Outcome	Timing	Responsibility
	Following initial submission of the DA, the shared pathway that runs along the riparian corridor was relocated to reduce impacts to the River-flat Eucalypt Forest EEC.			



Legend

- Subject land
- Development footprint
- Hollow-bearing tree

Vegetation zone

- 3320_Moderate
- 3320_Low
- 3320_Planted
- 3975_Moderate
- 4025_Moderate
- 4025_Revegetated

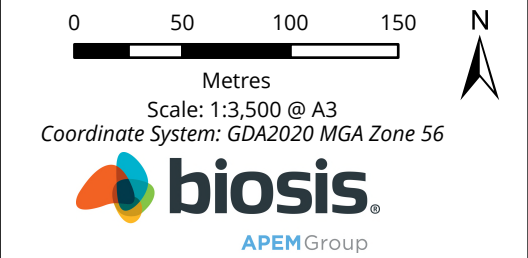
Threatened ecological communities (BC Act)

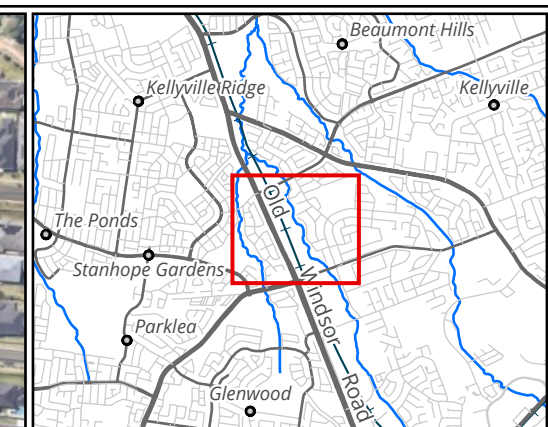
- Cumberland Plain Woodland in the Sydney Basin Bioregion (CEEC)
- Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (EEC)
- River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (EEC)

(EPBC Act)

- Cumberland Plain Woodland (CEEC)
- Riverflat Euc Forest (CEEC)

Figure 11 Final development footprint





Legend

- Subject land
- Post-DA - Development footprint
- SSDA - Development footprint

Impact comparison

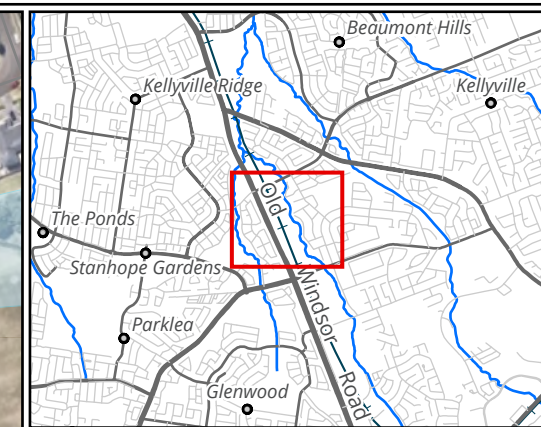
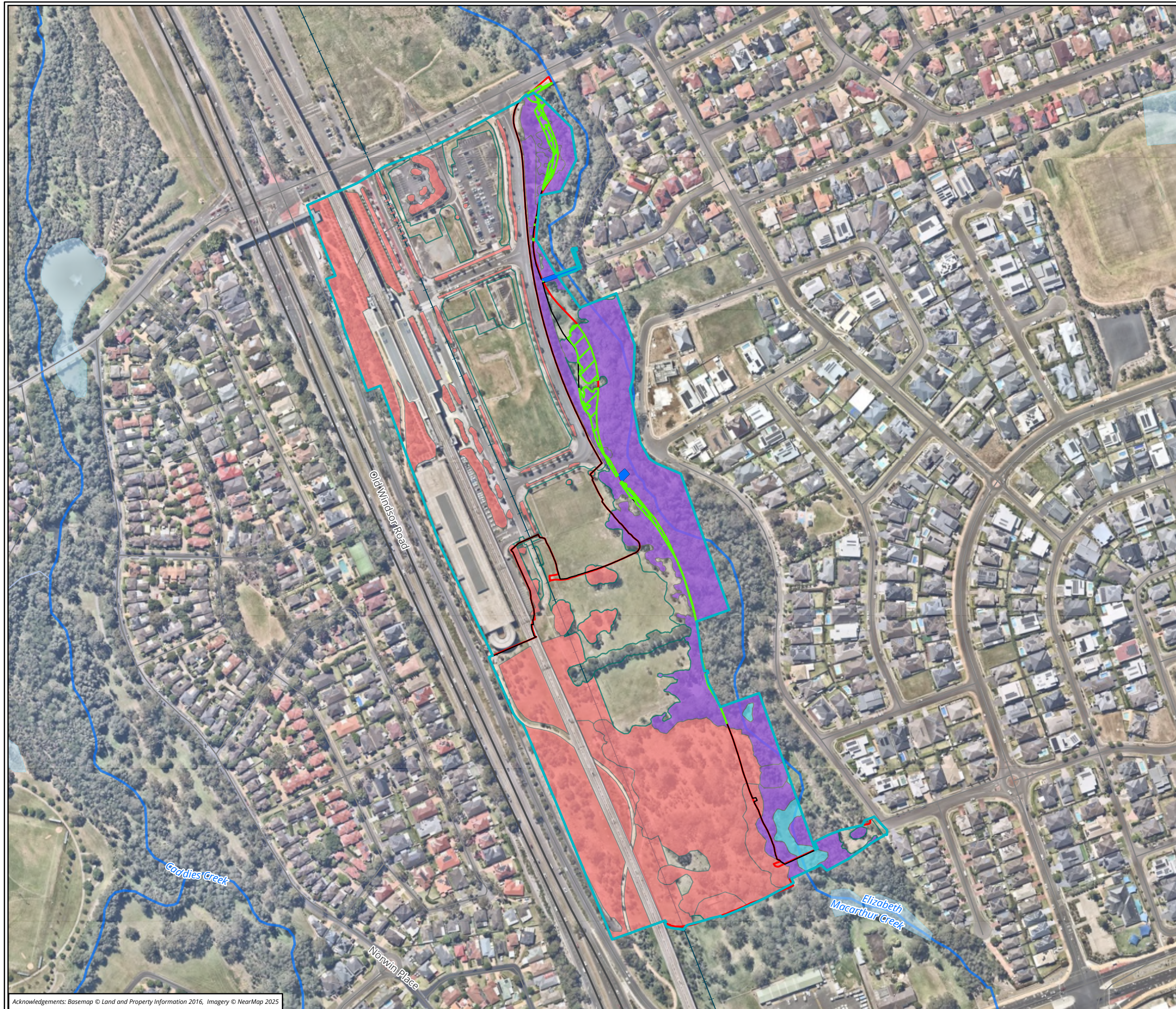
- SSDA BDAR avoided, Post-DA avoided
- SSDA BDAR avoided, Post-DA impacted
- SSDA BDAR impacted, Post-DA avoided
- SSDA BDAR impacted, Post-DA impacted

Figure 12 Avoidance 01 - Updated DA and SSDA direct impact comparison

0 50 100 150
Metres
Scale: 1:4,000 @ A3
Coordinate System: GDA2020 MGA Zone 56

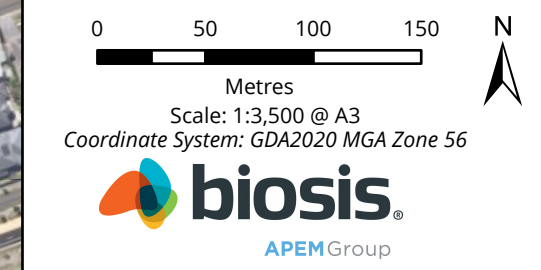
biosis
APEM Group

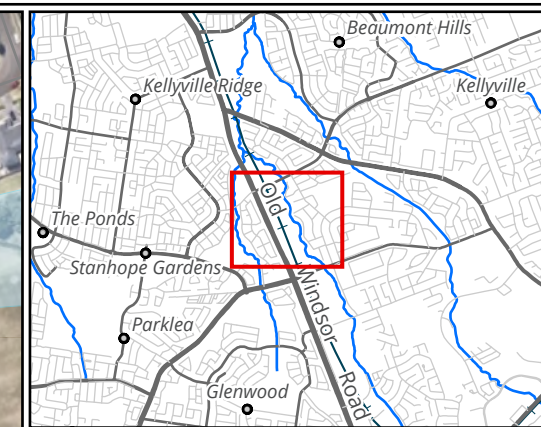
Matter: 40523, Date: 16 April 2026,
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyvilleSP_BDAR_Part2.aprx
Layout: 40523_F12a_Avoidance



- Legend**
- Subject land
 - Post-DA - Development footprint
 - DA Development footprint
- Impact comparison**
- Impacts not considered in DA
 - Vegetation avoided Post-DA
- Plant Community Type**
- 3320
 - 3975
 - 4025
 - Urban Native/Exotic, Exotic vegetation

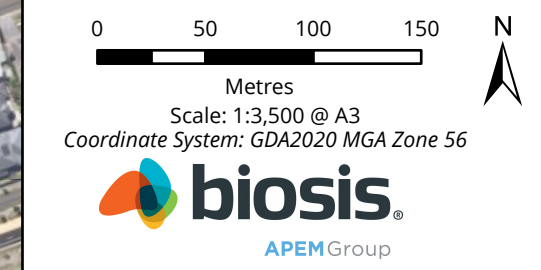
Figure 12 Avoidance 02 - Updated DA additional avoidance of direct impacts





- Legend**
- Subject land
 - Development footprint
 - Areas of avoidance
- Alternative footprint and design**
- SSDA concept design

Figure 12c Alternate options and avoidance



6 Impacts that are unable to be avoided

Assessment of direct and indirect impacts unable to be avoided has been undertaken in accordance with the BAM (DPIE 2020a). The following direct and indirect impacts are unable to be avoided in progressing the proposed development.

Impacts to Matters of National Environmental Significance (MNES) is addressed in Section 11.1 and impacts to *Fisheries Management Act 1994* (FM Act) matters is addressed in Section 11.3.

6.1 Direct impacts

Direct impacts include vegetation clearing calculated from the area of proposed lot boundaries, roads and easements for service infrastructure.

Direct impacts arising from the project include:

- Removal of 4.18 ha of native vegetation consistent with the CEEC *Cumberland Plain Woodland in the Sydney Basin Bioregion* (BC Act), comprising 1.96 ha of PCT 3320 Landscape Plantings, 0.27 ha of PCT 3320 Low, and 1.95 ha of PCT 3320 Moderate condition.
 - Removal of 1.95 ha of the CEEC *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* (EPBC Act), comprising 1.95 ha of PCT 3320 Moderate condition.
- Removal of 0.04 ha of native vegetation consistent with the EEC *Sydney Freshwater Wetlands in the Sydney Basin Bioregion* (BC Act), comprising 0.04 ha of PCT 3975 Moderate condition.
- Removal of 1.19 ha of native vegetation consistent with the EECs *River-flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* (BC Act) and *River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria* (EPBC Act), comprising 0.42 ha of PCT 4025 Revegetated and 0.77 ha of PCT 4025 Moderation condition.
- Removal of 5.14 ha of habitat for Southern Myotis.

These impacts will be permanent and will occur from the outset of the development. Mitigation measures outlined in Section 7 below will help to minimise the potential impacts to biodiversity values that remain present within the subject land.

A summary of PCTs/zones and species credits species directly impacted is demonstrated in Table 36 and Table 37, respectively.

Table 36 Summary of direct impacts to vegetation

Zone	PCT	Area within subject land (ha)	Area impacted (ha)	VI Score
3320_Landscape plantings	PCT 3320 <i>Cumberland Shale Plains Woodland</i>	3.29	1.96	12.4
3320_Low		0.28	0.27	26.5
3320_Moderate		2.07	1.95	68.4
3975_Moderate	PCT 3975 <i>Southern Lower Floodplain Freshwater Wetland</i>	0.15	0.04	18.4

Zone	PCT	Area within subject land (ha)	Area impacted (ha)	VI Score
4025_Revegetated	PCT 4025 <i>Cumberland Red Gum Riverflat Forest</i>	0.70	0.42	54.4
4025_Moderate		2.62	0.77*	69.9

*Based on the updated Arboricultural Impact Assessment (CPS 2026), additional indirect impacts to trees, via substantial root zone incursions, will occur along the riparian corridor interface. These areas have been included in the total impacts to PCT 4024 / River-flat Eucalypt Forest outlined throughout this report.

Table 37 Summary of direct impacts to species credit species habitat or individuals

Species	Sensitivity	Area (ha) or count
Southern Myotis	High Sensitivity to Gain	5.14* ha in development footprint

*Includes additional indirect impacts based on the updated Arboricultural Impact Assessment (CPS 2026).

6.1.1 Loss of hollow bearing trees

A total of 36 hollow-bearing trees are present within the subject land, of which, 20 are within the development footprint.

6.2 Indirect impacts

Potential indirect impacts arising from the project are outlined and addressed in Table 38 and shown in Figure 13.

It should be noted that further assessment of indirect impacts may be required following the analysis of acoustic data recorded in December 2025, which will be included in the finalised BDAR.

Table 38 Assessment of indirect impacts

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
Inadvertent impacts on adjacent habitat or vegetation	- Cumberland Plain Woodland CEEC (BC Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act). - River flat Eucalypt Forest EEC (BC Act) and River flat Eucalypt Forest CEEC (EPBC Act). - Freshwater Wetlands EEC. - All ecosystem credit species assumed present. - Southern Myotis.	3.71 ha retained native vegetation and habitats	Ongoing	Short – long term	Construction and post-construction phase	<u>Moderate</u>. Based on the updated Arboricultural Impact Assessment (CPS 2026), additional indirect impacts to trees, via substantial root zone incursions, will occur along the riparian corridor interface. These incursions are the result of battering, retaining walls, and management easements, befeather the canopy of trees, but all remain within the civil / earthworks extent of impacts. The loss of trees as a result of root zone incursions is not considered a complete loss to the PCT / vegetation zone within which they occur, where impacts will not occur to the soil profile past the extent of proposed civil / earthworks. Furthermore, it is not justifiable to map impacts to the extent of the tree canopy, where impacts will not occur to the understorey and ground layer components of the PCT / vegetation zone. Each location where CPS (2026) has determined trees to be lost along the civil / earthworks extent and riparian corridor interface has been assessed, and were justified, by expected additional impacts to the PCT / vegetation zone and/or insufficient retention of non-impacted trees, additional areas of impacts have been mapped and included in direct impact calculation throughout this report. These areas are illustrated on Figure 13. <u>Low – moderate</u>: Impacts to adjacent vegetation during construction and operational phase can be prevented or minimised through appropriate exclusion fencing, implementation of a CEMP detailing best practice environmental protection measures, strict water quality practices and stormwater controls,

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
						and by ensuring any lighting is directed towards the developed area, rather than towards the adjacent retained habitats.
Reduced viability of adjacent habitat due to edge effects	- Cumberland Plain Woodland CEEC (BC Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act). - River flat Eucalypt Forest EEC (BC Act) and River flat Eucalypt Forest CEEC (EPBC Act). - Freshwater Wetlands EEC. - All ecosystem credit species assumed present. - Southern Myotis.	3.71 ha retained native vegetation and habitats	Ongoing	Short – long term	Construction and post-construction phase	<u>Low – moderate</u> : Adjacent habitats are currently subject to a moderate degree of disturbance due to past clearing and surrounding residential and urban development. Although 5.51 ha of vegetation will be removed from the subject land, much of the higher quality habitat on the eastern side of Elizabeth Macarthur Creek will be retained. Future management of retained vegetation and additional open space landscaping in combination within appropriate water quality and site management principles will safeguard the riparian corridor from further impacts.
Reduced viability of adjacent habitat due to noise, dust or light spill	- All ecosystem credit species assumed present. All native fauna considered part of: - Cumberland Plain Woodland CEEC (BC Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act). - River flat Eucalypt Forest EEC (BC Act)	3.71 ha retained native vegetation and habitats	Ongoing	Short – long term	Construction and post-construction phase	<u>Moderate</u> : It is predicted that the adjacent habitat will be impacted by noise, dust and light spill, during and (to a lesser degree) post construction within the subject land. However, adjacent habitats are currently subject to light, dust and noise disturbance due to proximity to the existing rail corridor and surrounding development. Impacts from the project will be managed through a CEMP to ensure retained and adjacent habitat does not decline or be subjected to adverse impacts.

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
	and River flat Eucalypt Forest CEEC (EPBC Act). - Freshwater Wetlands EEC. - Southern Myotis.					
Transport of weeds and pathogens from the site to adjacent vegetation	- Cumberland Plain Woodland CEEC (BC Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act). - River flat Eucalypt Forest EEC (BC Act) and River flat Eucalypt Forest CEEC (EPBC Act). - Freshwater Wetlands EEC.	3.71 ha retained native vegetation and habitats	Unknown	Short – long term	Construction and post-construction phase	<u>Low:</u> Weeds occurring within the subject land are typical of the locality and are widespread throughout the riparian vegetation of Elizabeth Macarthur Creek, including within adjacent vegetation to be retained. Increased transport of pathogens and weeds is unlikely to occur as a result of the project but should be managed by biosecurity measures outlined in the CEMP.
Increased risk of starvation, exposure and loss of shade or shelter	- All ecosystem credit species assumed present. - Southern Myotis. All native fauna considered part of: - Cumberland Plain Woodland CEEC (BC Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act).	3.71 ha retained native vegetation and habitats	One off	Short-term	Construction	<u>Low:</u> While no threatened species were recorded during targeted surveys, non-threatened locally occurring fauna species have the potential to utilise the vegetation in the subject land and may be impacted by loss of canopy cover and tree hollows. The removal of vegetation is expected to be supplemented by plantings within open space areas, which include locally appropriate flora species likely to provide foraging and shelter resources for local fauna, albeit in a structured landscape context. Nest boxes are to be installed in retained vegetation to offset the loss of hollows.

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
	- River flat Eucalypt Forest EEC (BC Act) and River flat Eucalypt Forest CEEC (EPBC Act). - Freshwater Wetlands EEC.					
Loss of breeding habitats	- All ecosystem credit species assumed present. - Hollow-dependent fauna species - Southern Myotis.	3.71 ha retained native vegetation and habitats	One off	Short-term	Construction	<u>Low</u>: Although 20 hollow-bearing trees occur within the development footprint, no threatened species that utilise hollows for breeding were recorded in the subject land during targeted surveys. In addition, vegetation on the eastern side of Elizabeth Macarthur Creek, including several hollow-bearing trees, will be retained and likely provides higher quality habitat. No other specialist breeding habitat will be impacted by the project. Nest boxes are to be installed in retained vegetation to offset the loss of hollows.
Trampling of threatened flora species	Nil	Nil	N/a	N/a	N/a	<u>Nil</u>: No threatened flora species were found, or are considered likely to occur, within the subject land, and thus trampling of threatened flora species is unlikely.
Inhibition of nitrogen fixation and increased soil salinity	- Cumberland Plain Woodland CEEC (BC Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act). - River flat Eucalypt Forest EEC (BC Act) and River flat	3.71 ha retained native vegetation and habitats	Ongoing	Long-term	Construction and operation	<u>Low</u>: Any future excavations or soil disturbance resulting from the future development of the subject land would be largely restricted to areas having undergone significant previous disturbance through vegetation clearing and vehicular traffic. There is potential that the project, including implementation of drainage and stormwater infrastructure and proposed geotechnical investigations, may result in further disturbance to soil and increase mobile salts

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
	Eucalypt Forest CEEC (EPBC Act). Freshwater Wetlands EEC.					within the creek; however, water and soil quality should be monitored and addressed through a CEMP.
Fertiliser or herbicide drift	- Cumberland Plain Woodland CEEC (BC Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act). - River flat Eucalypt Forest EEC (BC Act) and River flat Eucalypt Forest CEEC (EPBC Act). - Freshwater Wetlands EEC.	3.71 ha retained native vegetation and habitats	Ongoing	Long-term	Post construction	<u>Low</u> : The subject land does not contain productive areas which would require the regular application of a bulk fertiliser or herbicide that may pose inherent risk to sensitive native ecosystems.
Rubbish dumping	- Cumberland Plain Woodland CEEC (BC Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act). - River flat Eucalypt Forest EEC (BC Act) and River flat Eucalypt Forest CEEC (EPBC Act). - Freshwater Wetlands EEC.	3.71 ha retained native vegetation and habitats	Ongoing	Long-term	Post construction	<u>Low</u> : Standard environmental controls for the development would ensure potential impacts are minimised. Works would follow an approved Waste Management Plan. Whilst the subject land will support a larger population of residents, it is possible that any dumping could reduce from current levels, due to the lower likelihood of illegal dumping occurring in more highly populated areas.
Wood collection	Cumberland Plain Woodland CEEC (BC	3.71 ha retained	Ongoing	Long-term	Post construction	<u>Negligible</u> : The vegetation clearing associated with the project is unlikely to increase access to any retained

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
	Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act). - River flat Eucalypt Forest EEC (BC Act) and River flat Eucalypt Forest CEEC (EPBC Act). - Freshwater Wetlands EEC.	native vegetation and habitats				vegetation, beyond current access capacity. Based on the future use of the subject land, future landholders are not expected to be likely to undertake wood collection within the retained vegetation to a level that it will have a detrimental effect. Unauthorised access and collection of wood is expected to be minimal.
Removal and disturbance of rocks, including bush rock	N/A	N/A	N/A	N/A	N/A	<u>Negligible</u> : The subject land does not support bush rock.
Increase in predators	- All ecosystem credit species assumed present. - Southern Myotis.	3.71 ha retained native vegetation and habitats	Ongoing	Long term	Post construction	<u>Negligible</u> : The subject land already occurs within an urbanised setting where domestic animals, such as dogs <i>Canis lupus familiaris</i> and cats <i>Felis catus</i> , and other predator species such as the European Fox <i>Vulpes vulpes</i> are common. The project is unlikely to increase predatory species populations beyond what is already present in the area. Removal of vegetation and subsequent development of the area, including installation of fencing, may lead to a decline in wild and domestic predators.
Increase in pest animal populations	- All ecosystem credit species assumed present. - Southern Myotis.	3.71 ha retained native vegetation and habitats	Ongoing	Long term	Post construction	<u>Negligible</u> : The proposal occurs in an urbanised area, where introduced domestic pets such as cats are already present in high abundance within the locality. Pest animals such as Rats <i>Rattus rattus</i> and European Rabbit <i>Oryctolagus cuniculus</i> are also widely spread within the Western Sydney region and are likely to occur across the locality. The proposal will not result in an increase in available habitat for these species and

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
						is unlikely to lead to an increase in pest animal populations. Suitable waste disposal implemented during and post construction will further reduce the resources available for pest species.
Changed fire regimes	- Cumberland Plain Woodland CEEC (BC Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act). - River flat Eucalypt Forest EEC (BC Act) and River flat Eucalypt Forest CEEC (EPBC Act). - Freshwater Wetlands EEC.	3.71 ha retained native vegetation and habitats	Ongoing	Long term	Post construction	<u>Negligible</u>: The proposal occurs in an urbanised area and is not currently influenced by natural fire regimes. The project is considered unlikely to result in an increase in fire frequency or severity, such that adjacent TECs and habitat would be significantly impacted.
Disturbance to specialist breeding and foraging habitat, e.g. Beach nesting for shorebirds	N/A	N/A	N/A	N/A	N/A	<u>Negligible</u>: The subject land does not support any mapped Important Habitat for threatened species, including migratory shore birds.
Fragmentation of movement corridors	All native fauna considered part of: Cumberland Plain Woodland CEEC (BC Act) and Cumberland Plain Shales Woodland CEEC (EPBC Act).	3.71 ha retained native vegetation and habitats	One-off	Long term	Construction and post construction	<u>Low</u>: Movement corridors are largely restricted to the riparian corridor of Elizabeth Macarthur Creek and connected waterways, which varies in width and availability throughout the locality. The project will result in the removal of 5.51 ha of native vegetation that may result in further narrowing and fragmentation of this movement corridor. However, the vegetation to the east of the creek will be retained and landscape planting of locally occurring flora will

Indirect impact	Impacted entities	Extent	Frequency	Duration	Project phase/ timing of impact	Likelihood and consequences
	• River flat Eucalypt Forest EEC (BC Act) and River flat Eucalypt Forest CEEC (EPBC Act). • Freshwater Wetlands EEC. • All ecosystem credit species assumed present. • Southern Myotis.					be undertaken in proposed open spaces, which will help to mitigate fragmentation.

6.3 Prescribed impacts

Identification and assessment of prescribed biodiversity impacts are outlined and addressed in Table 39, and the section below, and shown on Figure 13.

Table 39 Identification of prescribed impacts

Prescribed impact	Description of relevant habitat features associated with prescribed impacts	Threatened species likely to utilise habitat features associated with prescribed impact in the subject land	Importance to impacted species in the subject land
Karst, caves, crevices, cliffs, rocks and other geological features of significance	No areas of geological significance occur within the subject land. The development will not impact on threatened species or ecological communities associated with karst, caves, crevices or cliffs within the subject land.	N/A	N/A
Occurrences of human-made structures and non-native vegetation	No human-made structures occur within the subject land. The development will not impact on threatened species or ecological communities associated with human-made structures within the subject land. Non-native vegetation has been mapped across the subject land and development footprint. However, this vegetation is not considered to provide habitat for threatened species.	N/A	N/A
Corridors or other areas of connectivity linking habitat for threatened entities	As the subject land and development footprint occur in a highly urbanised area, with evidence of historic widespread clearing across much of the broader landscape, native vegetation within the subject land occurs in a fragmented state with limited connectivity to surrounding vegetation. The primary connectivity feature within the subject land is the contiguous patch of remnant, riparian vegetation along Elizabeth Macarther Creek, which supports a habitat corridor that extends to the north of the subject land.	Threatened entities within the subject land associated with this prescribed impact include: • Cumberland Plain Woodland CEEC. • River flat Eucalypt Forest EEC. • Sydney Freshwater Wetlands EEC. • Southern Myotis	<u>Moderate:</u> Habitat connectivity is critical for maintaining healthy populations, as it promotes biological diversity through the exchange of genes. All fauna species and ecological communities rely on habitat connectivity to some degree for persistence. Habitat connectivity is more important for species with reproductive strategies that require movement of individuals or reproductive material through the landscape. While the project has the potential to result in a minor decrease local connectivity by reducing density of vegetation within the existing corridor, and construction of the watercourse crossing, connectivity across the broader landscape will be maintained through the retained vegetation along Elizabeth Macarthur Creek. Given that connectivity within the assessment area is somewhat limited due to significant residential and urban development, the project is unlikely to reduce connectivity to a point that it would prevent genetic of material.

Prescribed impact	Description of relevant habitat features associated with prescribed impacts	Threatened species likely to utilise habitat features associated with prescribed impact in the subject land	Importance to impacted species in the subject land
Water bodies or any hydrological processes that sustain threatened entities	The proposed works are not expected to further impact hydrological processes within the subject land. One watercourse, Elizabeth Macarthur Creek, intersects the subject land along the eastern boundary. Remnant riparian vegetation occurred along the extent of the creek within the subject land; however, the condition of this vegetation and associated habitat varied. Although parts of the creek contained fringing vegetation and various substrates that may provide habitat for aquatic, semi-aquatic and terrestrial species, habitat was also significantly degraded in parts.	Southern Myotis	<u>Moderate</u>: the proposed works will involve the construction of drainage and stormwater infrastructure, including temporary stormwater basins within the subject land, and a watercourse crossing; however, this is not expected to further impact hydrological process within the subject land. The proposed works are not expected to have a significant impact on the creek within the subject land and no threatened species with the potential to be utilising this habitat feature were recorded during targeted surveys. As such, no threatened species are expected to be impacted by the proposed development
Protected animals that may use the proposed wind farm subject land as a flyway or migration route	This project does not involve wind turbines.	N/A	N/A
Where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community	As that the project will involve the construction of new roads, as well as electrical, wastewater and telecommunications infrastructure and associated activities, the project has potential to result in increased vehicle traffic during the construction and operational phase. The increase in vehicle traffic has the potential to impact upon native fauna species that are active during the day, with a higher potential for impact in areas where refuge/forage habitat exists immediately adjacent to areas where vehicle movements will occur. Construction traffic moving through the riparian vegetation of Elizabeth Macarthur Creek is likely to incur the highest risk of vehicle strike; however, the majority of the development will occur in locations that are generally already cleared of native vegetation.	Threatened entities within the subject land associated with this prescribed impact include ecosystem credit bird species.	<u>Low</u>: Given the proximity of major and residential roads to the subject land and the highly urbanised setting, the risk of vehicle strike is likely already present. There is potential that this may be exacerbated during and post construction; however, no threatened species were recorded during targeted surveys and therefore, the risk of impact to threatened species is low. Non-threatened fauna that may inhabit the general area, including small mammals, are likely most at risk.

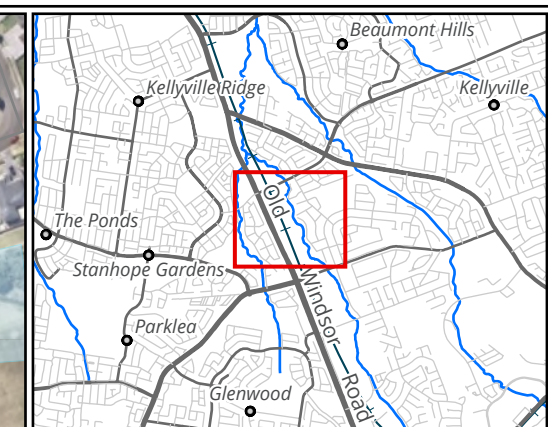
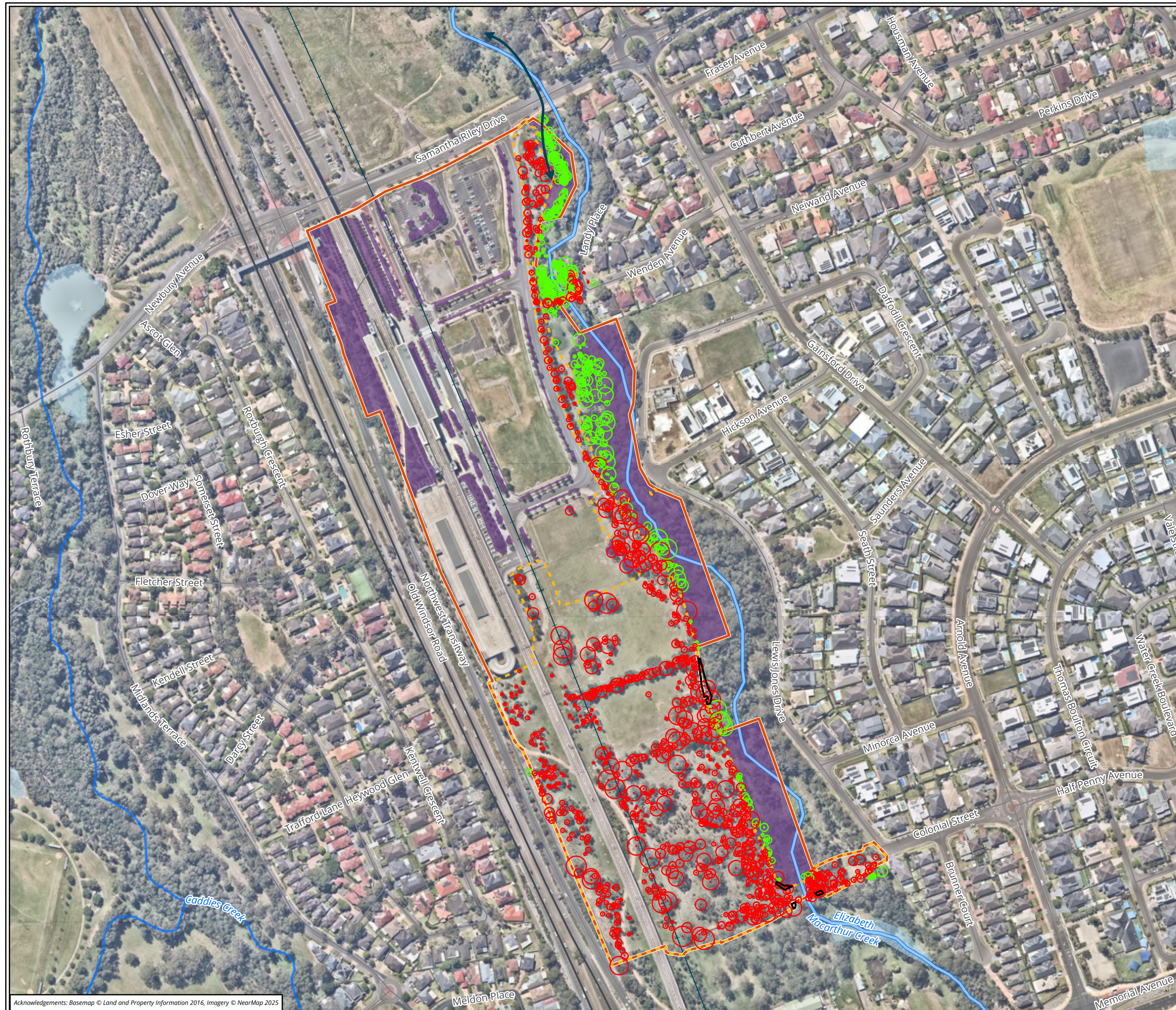
6.4 Impacts considered uncertain

There are no impacts considered uncertain for the current assessment.

6.5 Impacts to Groundwater Dependent Ecosystems (GDE)

Assessment of the potential for the subject land to support groundwater dependant ecosystems (GDEs) was undertaken using the Australian Government's Bureau of Meteorology Groundwater Dependant Ecosystems Atlas (BOM 2019) and GDE High Ecological Value Aquatic Ecosystems (HEVAE) Spatial Portal (OEH & DPI Fisheries 2020). A portion of the subject land along Elizabeth Macarthur Creek is mapped as having High, Moderate and Low potential for terrestrial GDE's according to BOM (2019), and a moderate probability for GDEs according to HEVAE Spatial Portal (2020).

The subject land is not mapped as supporting GDEs associated with an aquifer in Appendix 8 of the Risk Assessment Guidelines for Groundwater Dependent Ecosystems (DPI 2012). The subject land is not mapped as having Groundwater Vulnerability (The Hills LEP).



- Legend**
- Subject land
 - Development footprint
 - Indirect impacts
 - Indirect impacts - additional trees removed
- Tree location plan**
- Tree - Existing removed
 - Tree - Existing retained
- Prescribed impacts**
- Habitat connectivity
 - Elizabeth Macarthur Creek

Figure 13 Indirect and prescribed impacts

0 50 100 150 Metres

Scale: 1:3,500 @ A3

Coordinate System: GDA2020 MGA Zone 56

biosis
APEM Group

Matter: 40523, Date: 30 April 2026,
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyvilleSP_BDAR_Part2.aprx
Layout: 40523_F13_IndirectPrescImpact

7 Mitigation and management of impacts

Identification of measures to mitigate or manage impacts has been undertaken in accordance with the BAM (DPIE 2020a), including considerations such as:

- Techniques, timing, frequency and responsibility.
- Identification of measures for which there is risk of failure.
- Evaluation of the risk and consequence of any residual impacts.
- Documentation of any adaptive management strategy proposed.

Identification of measures for mitigating impacts related to:

- Displacement of resident fauna.
- Indirect impacts on retained native vegetation and habitat.
- Mitigating prescribed biodiversity impacts.
- Details of the adaptive management proposed to monitor and respond to impacts on biodiversity values that are uncertain.

Table 40 Measures to mitigate and manage impacts

Measures to mitigate and manage impacts	Action	Outcome	Timing	Responsibility
Displacement of resident fauna	A CEMP will be implemented that includes the following sub-plans or protocols: • Clear identification of any 'No Go Zones' around retained vegetation or protected habitat features. • Timing of works to avoid critical life cycle events for resident fauna such as breeding or nursing. • Pre-clearance survey requirements. • Clearing protocols. • Procedures for unexpected finds and fauna handling. • Plan for retention and re-use of appropriate trees as ground habitat within Elizabeth Macarthur Creek riparian zone. • Hollow-bearing tree/ Nest Box removal specification (see detail below). • Biodiversity Management Plan (BMP) to protect, monitor and manage locally occurring species and their habitats during construction.	• Effective clearing protocols minimise direct and indirect impacts of construction. • Effective management of resident flora, fauna and ecological communities to minimise direct and indirect impacts.	Pre-construction, construction, and post construction.	Landcom Construction Contractor Project ecologist
	Any hollow-bearing trees marked for removal must be removed in accordance with a vegetation clearance protocol to ensure no injury or loss of fauna. The procedure will include the following: • Prior to vegetation removal, hollow-bearing trees are inspected and knocked to encourage resident fauna to evacuate the tree. • All vegetation surrounding the hollow-bearing tree is then cleared and grubbed. • Hollow-bearing trees to be inspected immediately prior to removal (24 to 48 hours following vegetation clearance), by a qualified ecologist. • If fauna is still present within the tree, the hollow section is to be lowered to the ground to allow the animal to move on of its volition.	• No direct impact to resident fauna during vegetation removal.	Immediately prior to vegetation removal.	Qualified ecologist and construction contractor.
Indirect impacts on native vegetation and habitat	Stormwater and erosion controls designed and implemented in accordance with current industry best practice.	• Effective management of potential indirect impacts	Ongoing	Landcom Construction Contractor

Measures to mitigate and manage impacts	Action	Outcome	Timing	Responsibility
	Two stage pre-clearing protocols, including pre-clearing inspections, establishment of exclusion zones and on-ground identification of specific habitat features to be retained and/ or relocated.	such that they do not occur or are minimal.		
	Installation of appropriate exclusion fencing around trees and vegetation to be retained in the subject land: - The radius of the tree protection zone (TPZ) is calculated for each tree by multiplying its diameter at breast height by 12, in accordance with the Standards Australia Committee (2009). - A TPZ should not be less than 2 m, or greater than 15 m, except where crown protection is required (Standards Australia 2009). - This would include appropriate signage such as 'No Go Zone' or 'Environmental Protection Area'. Identify the location of any 'No Go Zones' in site inductions and a Construction Environmental Management Plan (CEMP).	- Mitigate impact to resident fauna and their habitat by reducing weed and pathogen spread. - No further degradation to retained vegetation and habitats.		
	Implementation of appropriate weed and pathogen management, including weed hygiene protocols for personnel, machinery and construction materials entering and exiting construction areas to minimise risk of weed and pathogen introduction and spread.			
	Material stockpiles, vehicle parking and machinery storage, and other ancillary works are to be located within areas considered impacted within the current assessment and not be located within retained vegetation outside the impact area.			
	Reduction of impacts resulting from external lighting is recommended, and can be adapted from Part 4 (good lighting design principles) of the Dark Sky Planning Guideline (DPE 2016), including: - Installing light fitting shields with an opaque cover, mounted horizontally across the top of the lighting module. These shielding attachments allow only the downward projection of light. - Direct lights downwards and avoid shining directly onto the public amenities, which have the potential to reflect light skywards.			

Measures to mitigate and manage impacts	Action	Outcome	Timing	Responsibility
	Utilise low beam angles that are close to vertical where possible to minimise light glare.			
	Where appropriate native vegetation cleared from the subject land should be mulched for re-use on the site, to stabilise bare ground.			
	Implementation of dust control measures to avoid any indirect impacts to native vegetation and species utilising the area as habitat. Works areas should be wet down to reduce dust generation during construction.			
	Implementation of noise barriers or daily/seasonal timing of construction and operational activities to reduce impacts to species utilising the native vegetation outside the development footprint.			
	Mitigation of indirect impacts via the following: - The Cumberland Plain Woodland CEEC will be further retained and rehabilitated within open space areas proposed as part of the Concept Plan. - Where possible, trees that form part of the Cumberland Plain Woodland CEEC will be investigated for retention within Lots and Parks proposed as part of the Concept Plan. - Implementation of a VMP to manage and restore (regenerate) the retained habitat within the riparian corridor of Elizabeth Macarthur Creek.			
	Implementation of mitigation measures to reduce direct and indirect impacts on locally occurring microbats, including threatened species, such as: - Where feasible, the removal of hollow-bearing trees should occur outside of the typical breeding season for Southern Myotis and other microbats, which generally occurs between October and March. - Installation of passive roost exclusions on suitable tree hollows proposed to be removed within the development footprint. The applied exclusion will need to be tightly fitted and inspected daily to			

Measures to mitigate and manage impacts	Action	Outcome	Timing	Responsibility
	ensure the integrity of the exclusion is not compromised. Removal of tree hollows is to occur in accordance with the process described above. - Undertake a pre-clearance survey immediately prior to the installation of the passive roost exclusions to ensure individuals are not present during application. - Installation of supplementary roosting habitat (artificial hollows) in proximity to foraging habitat at a ratio of 2:1.			
Mitigating prescribed biodiversity impacts	Connectivity corridors: - Retention and rehabilitation of vegetation in open space areas and streetscape to support retention of the existing habitat corridor along Elizabeth Macarthur Creek. - Installation of nest boxes at a ratio of no less than 2:1 (for tree hollows removed). - Implementation of appropriate fencing to clearly delineate protected areas, exclusion zones, habitat features proposed for retention and areas to be rehabilitated. - Implementation of a VMP to manage and restore (regenerate) the retained habitat within the riparian corridor of Elizabeth Macarthur Creek. Water bodies, water quality and hydrology: - Development of a project CEMP which includes an adaptive management strategy. - Minimise soil erosion and the discharge of sediment and other pollutants from the site during construction. - Establish surface water quantity and quality monitoring requirements. - Establish erosion and sedimentation controls within impacted sections of riparian corridors. Vehicle strike: - Implementation of speed limits and additional signage in these areas will help to prevent an increase in vehicle strike.	Effective management of prescribed impacts such that they do not occur or are minimal.	Ongoing	Landcom Construction Contractor

Measures to mitigate and manage impacts	Action	Outcome	Timing	Responsibility
Adaptive management strategies proposed to monitor and respond to impacts on biodiversity values that are uncertain	Implement an appropriate CEMP during works, that contains an adaptive management component. Adaptive management strategies are receptive to new and relevant data that may arise during ongoing assessment and monitoring of an active project. These strategies are key to the successful implementation of objectives, while allowing flexibility to respond to changing dynamics, and includes measures to monitor impacts considered uncertain and trigger appropriate management responses.	Effective management of uncertain impacts to biodiversity by ensuring intervention can occur as needed.	Pre-construction, construction and post-construction.	Landcom Construction Contractor

7.1 Adaptive management strategy

Construction and operational management plans will all contain an adaptive management component. Adaptive management strategies will be receptive to any new and relevant data that may arise through ongoing assessment and monitoring and are key to the successful implementation of crucial objectives yet also allow flexibility to changing dynamics and ongoing feedback and results. This includes measures to monitor predicted and uncertain impacts which will trigger adaptive management actions and allow for effective and quick responses.

8 Serious and irreversible impacts

This section addresses the TECs and/or threatened species that are at risk of a SAI including:

- Addressing all criteria for each TEC listed as at risk of an SAI present on the subject land.
- Addressing all criteria for each threatened species at risk of an SAI present on the subject land.
- Documenting assumptions made and/or limitations to information.
- Documenting all sources of data, information, references used or consulted.
- Clearly justifying why any criteria could not be addressed.

In accordance with Clause 6.7 of the BC Regulation an impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct because:

- (a) Principle 1: It will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline.
- (b) Principle 2: It will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size.
- (c) Principle 3: It is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution.
- (d) Principle 4: The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

One CEEC considered to meet the above principles and may be impacted by the development is the *Cumberland Plain Woodland in the Sydney Basin Bioregion* (CEEC). A detailed SAI assessment is provided in Appendix 5.

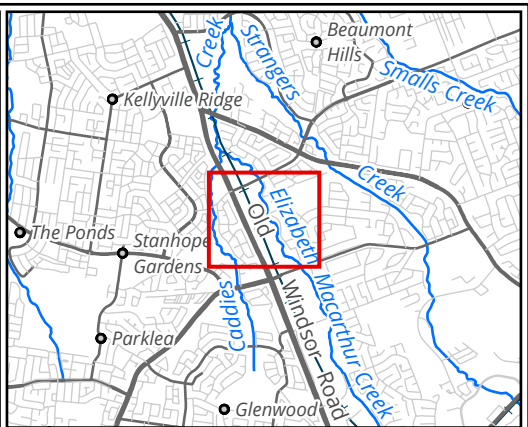
Figure 14 shows the extent of TECs and/or threatened species at risk of an SAI within the subject land.

It is acknowledged that it is not expected that the BAM Accredited Assessor provide conclusions or recommendations on whether an impact is serious and irreversible (DPE 2023), however in the context of the current assessment, the Sydney Central Planning Panel request for guidance to be provided, and Council having provided a clear statement on the subject, a response is considered appropriate.

Council stated in their feedback to proposed post-DA design refinements that *"While measures such as retaining walls represent an effort to reduce impacts on biodiversity values, the current proposal would result in increased impacts to entities at risk of Serious and Irreversible Impacts (SAI) beyond those approved under the Masterplan consent. Council's Ecology Team considers that any additional impacts to SAI entities, including impacts to CPW in better condition states, above those assessed under the approved Masterplan would result in a SAI when applying the relevant assessment steps and extinction risk principles."*

Increased impacts over those approved in the Concept Plan BDAR, even to the TEC "in better condition states", is not in itself a justification for a SAI occurring. Detailed assessment in accordance with the BAM of the TEC, with reference to the four SAI principles listed above, and how the project is likely to contribute to each, is provided in Appendix 5. This assessment reviewed in its entirety should be the determining factor on whether a SAI is likely to occur.

Based on the assessment in Appendix 5, the project will not have a significant or substantial impact upon the geographic extent of the CEEC, given impacts will occur to approximately 0.02% of the community (4.07 ha of the 22,774 ha estimated extent). Nor will the project contribute in a material way to further environmental degradation or the disruption of biotic processes, given the already highly fragmented condition the CEEC that occurs in within 500 m of the development footprint and other negative pressures already acting on the CEEC in the locality, and more broadly.



Legend

- Subject land
- Development footprint

Serious and irreversible impacts

- Cumberland Plain Woodland EEC (BC Act)

Figure 14 Serious and irreversible impacts (SAII)

0 50 100 150 Metres

Scale: 1:3,500 @ A3

Coordinate System: GDA2020 MGA Zone 56

biosis
APEM Group

Matter: 40523, Date: 03 February 2026,
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyvilleSP_BDAR_Part2.aprx
Layout: 40523_F14_SAI

9 Impact summary

This section outlines the impact summary for the project which has identified and assessed impacts on PCTs, TECs and threatened species including:

- Identification of impacts requiring offset.
- Identification of impacts not requiring offset.
- Identification of areas not requiring offset.

Figure 15 shows the location of impacts requiring offset, impacts not requiring offset and areas not requiring assessment.

9.1 Identification of impacts requiring offset

9.1.1 Impacts to native vegetation (ecosystem credits)

As outlined in Section 9.2.1 of the BAM, the assessor must determine an offset for all impacts of proposals on PCTs that are associated with a vegetation zone that has a vegetation integrity score of:

- (a) ≥ 15 , where the PCT is representative of an EEC or a CEEC.
- (b) ≥ 17 , where the PCT is associated with threatened species habitat (as represented by ecosystem credits) or represents a vulnerable ecological community.
- (c) ≥ 20 , where the PCT does not represent a TEC and is not associated with threatened species habitat.

On this basis, offsets are required for the following vegetation zones as it has a vegetation integrity score greater than 15.

- 3320_Low
- 3320_Moderate
- 3975_Moderate
- 4025_Revegetated
- 4025_Moderate

The offset requirement for the proposal was calculated using the BAM Calculator. Table 41 provides a summary of the ecosystem credit offsets required for impacts from proposed development at the subject land.

Table 41 Offsets required (ecosystem credits)

Vegetation zone	Area (ha)	Impact	VI score	Offset required	TEC	HBTs	Credit requirement
3320_Low	0.27	Clearance	26.5	Yes	Yes	Yes	4
3320_Moderate	1.95	Clearance	68.4	Yes	Yes	Yes	83
3975_Moderate	0.04	Clearance	18.4	Yes	Yes	Yes	1
4025_Revegetated	0.42	Clearance	54.4	Yes	Yes	No	11
4025_Moderate	0.77	Clearance	69.9	Yes	Yes	Yes	27

9.1.2 Impacts to threatened species and their habitat

As outlined in Section 9.2.2 of the BAM an offset is also required for the impacts of the proposals on the habitat of threatened species assessed for ecosystem credits and associated with a PCT in a vegetation zone with a vegetation integrity score of ≥ 17 .

The offset requirement for the proposal was calculated using the BAM Calculator. Table 42 provides a summary of the species credit offsets required for impacts from proposed development at the subject land.

Table 42 Offsets required (species credits)

Vegetation zone	Species	Habitat condition (vegetation integrity score) loss	Area (ha)	Biodiversity risk weighting	Credit requirement
3320_Low	Southern Myotis	26.5	0.27	2	4
3320_Moderate	Southern Myotis	68.4	1.95	2	67
3320_Landscape plantings	Southern Myotis	12.4	1.69	2	10
3975_Moderate	Southern Myotis	18.4	0.04	2	1
4025_Revegetated	Southern Myotis	54.4	0.42	2	11
4025_Moderate	Southern Myotis	69.9	0.77	2	27

9.2 Identification of impacts not requiring offset

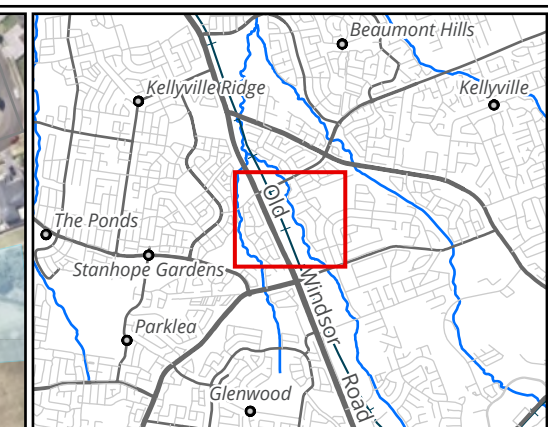
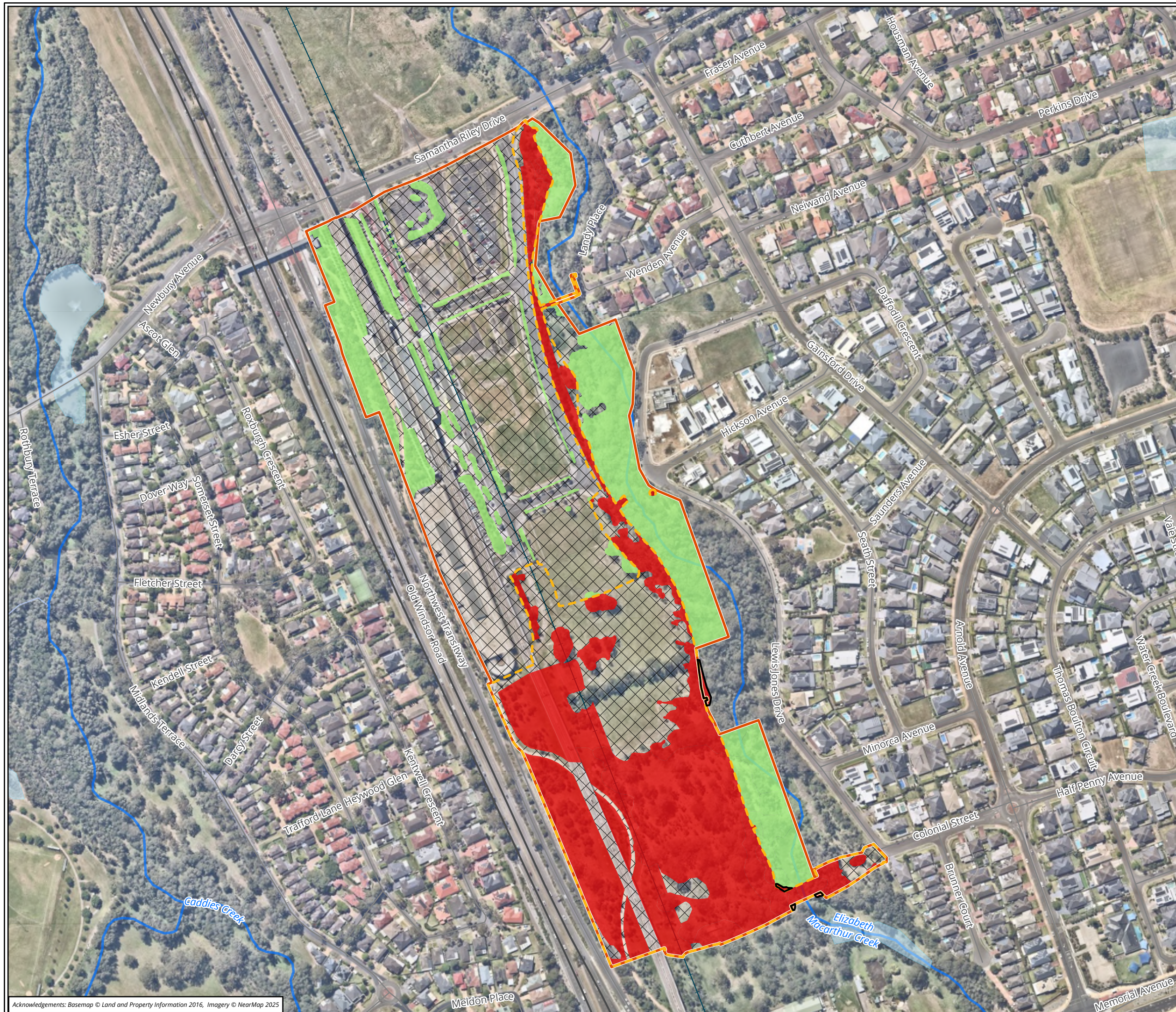
Following assessment, the following impacts do not require offsetting in accordance with BAM:

- Removal of 1.96 ha of PCT 3320 Landscape Plantings.
- Indirect impacts to 1.46 ha of PCT 3320.
- Indirect impacts to 0.11 ha of PCT 3975.
- Indirect impacts to 2.14 ha of PCT 4025.

9.3 Identification of areas not requiring assessment

Following assessment, the following areas do not require assessment in accordance with BAM:

- Removal of 0.17 ha of Exotic Vegetation.
- Removal of 1.73 ha of Exotic Groundcover.
- Removal of 0.87 ha of cleared land.



- Legend**
- Subject land
 - Development footprint
 - Indirect impacts - additional trees removed
- Offsets**
- Impacts requiring offset
 - Indirect impacts not requiring offset
 - Areas not requiring assessment

Figure 15 Impacts requiring offset, not requiring offset, not requiring assessment

0 50 100 150 Metres

Scale: 1:3,500 @ A3

Coordinate System: GDA2020 MGA Zone 56

biosis
APEM Group

Matter: 40523, Date: 29 April 2026,
Prepared for: KE, Prepared by: JB, Last edited by: Iharley
Location: P:\40500s\40523\Mapping\40523_KellyvilleSP_BDAR_Part2.aprx
Layout: 40523_F15_Offset

10 Biodiversity credit report

Offsetting through the transfer and retirement of biodiversity credits, or paying into the Biodiversity Conservation Fund, is required for the current assessment for impacts to native vegetation within the subject land. A biodiversity credit report is provided on the following pages.

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00062119/BAAS18138/25/00062120	Kellyville Station Precinct Stage 2 BDAR - Final Updated May 2026	09/04/2026
Assessor Name	Report Created	BAM Data version *
Callan Wharfe	04/05/2026	Current classification (live - default) (94)
Assessor Number	BAM Case Status	Date Finalised
BAAS18138	Finalised	04/05/2026
Assessment Revision	BOS entry trigger	Assessment Type
2	BOS Threshold: Biodiversity Values Map and area clearing threshold	Part 4 Developments (General)

* 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 SAI	Ecosystem credits
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Cumberland Red Gum Riverflat Forest												
5	4025_Revegetation	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	54.4	54.4	0.42	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		11
6	4025_Moderate	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	69.9	69.9	0.77	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		27
											Subtotal	38
Cumberland Shale Plains Woodland												
1	3320_Moderate	Cumberland Plain Woodland in the Sydney Basin Bioregion	68.4	68.4	2	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	83

BAM Credit Summary Report

2	3320_Low	Cumberland Plain Woodland in the Sydney Basin Bioregion	26.5	26.5	0.27	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	4
3	3320_Plan ted	Cumberland Plain Woodland in the Sydney Basin Bioregion	12.4	12.4	2	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Critically Endangered Ecological Community	Not Listed	2.50	True	0
											Subtotal	87
Southern Lower Floodplain Freshwater Wetland												
4	3975_Moderate	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	18.4	18.4	0.04	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		1
											Subtotal	1
											Total	126

Species credits for threatened species

BAM Credit Summary Report

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 SAI	Species credits
<i>Myotis macropus</i> / Southern Myotis (Fauna)									
3320_Moderate	68.4	68.4	2	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	67
3320_Low	26.5	26.5	0.27	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	4
3320_Planted	12.4	12.4	1.7	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	10
3975_Moderate	18.4	18.4	0.04	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
4025_Revegetation	54.4	54.4	0.42	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	11
4025_Moderate	69.9	69.9	0.77	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	27

BAM Credit Summary Report

								Subtotal	120
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BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00062119/BAAS18138/25/00062120	Kellyville Station Precinct Stage 2 BDAR - Final Updated May 2026	09/04/2026
Assessor Name	Assessor Number	BAM Data version *
Callan Wharfe	BAAS18138	Current classification (live - default) (94)
Proponent Names	Report Created	BAM Case Status
	04/05/2026	Finalised
Assessment Revision	BOS entry trigger	Assessment Type
2	BOS Threshold: Biodiversity Values Map and area clearing threshold	Part 4 Developments (General)
Date Finalised	* 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.	
04/05/2026		

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Cumberland Plain Woodland in the Sydney Basin Bioregion	Critically Endangered Ecological Community	3320-Cumberland Shale Plains Woodland
Species		

BAM Biodiversity Credit Report (Like for like)

Nil

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT

No Changes

Predicted Threatened Species Not On Site

Name

No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3320-Cumberland Shale Plains Woodland	Cumberland Plain Woodland in the Sydney Basin Bioregion	4.2	87	0	87
3975-Southern Lower Floodplain Freshwater Wetland	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.0	1	0	1
4025-Cumberland Red Gum Riverflat Forest	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	1.2	27	11	38

3320-Cumberland Shale Plains Woodland

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 3319, 3320	-	3320_Moderate	Yes	83	Cumberland, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 3319, 3320	-	3320_Low	Yes	4	Cumberland, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

	Cumberland Plain Woodland in the Sydney Basin Bioregion This includes PCT's: 3319, 3320	-	3320_Planted	No	0	Cumberland, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
3975-Southern Lower Floodplain Freshwater Wetland	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 1738, 3958, 3959, 3961, 3962, 3964, 3965, 3967, 3971, 3973, 3975, 3976	-	3975_Moderate	Yes	1	Cumberland, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
4025-Cumberland Red Gum Riverflat Forest	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region

BAM Biodiversity Credit Report (Like for like)

	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 3145, 3181, 3185, 3188, 3192, 3258, 3328, 4024, 4025, 4039, 4041, 4042, 4058, 4138	-	4025_Revegeta tion	No	11	Cumberland, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 3145, 3181, 3185, 3188, 3192, 3258, 3328, 4024, 4025, 4039, 4041, 4042, 4058, 4138	-	4025_Moderat e	Yes	27	Cumberland, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

BAM Biodiversity Credit Report (Like for like)

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Myotis macropus / Southern Myotis	3320_Moderate, 3320_Low, 3320_Planted, 3975_Moderate, 4025_Revegetation, 4025_Moderate	5.1	120.00

Credit Retirement Options

Like-for-like credit retirement options

Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW

11 Assessment against biodiversity legislation

11.1 Environment Protection and Biodiversity Conservation Act 1999

Given the likelihood for significant impacts to the Cumberland Plain Shale Woodlands CEEC and the River-flat eucalypt forest EEC, the EPBC Act was likely to be triggered and referral of the proposed action to the Australian Government Minister for the Environment and Energy was undertaken for the concept plan approval (EPBC Act referral 2020/8828). Approval for Kellyville SP Concept Plan was granted with controlling provisions on 31 October 2021 and remains in effect until 01 January 2041. The proposed development must comply with Conditions of Approval (CoA) 1-22, as defined by Part C of the Approval, with controls including the removal of no more than:

- 1.83 ha of PCT 849 Grey Box – Forest Red Gum grass open woodland on flats of the Cumberland Plain, Sydney Basin Bioregion (PCT equivalent to Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest CEEC).
- 0.82 ha of PCT 835 Forest Red Gum – Rough-barked Apple grassy woodland on alluvial flats of the Cumberland Plain, Sydney Basin Bioregion (PCT equivalent to River-flat Eucalypt Forest on coastal floodplains CEEC).

Note that the PCT mapping in the Concept Plan BDAR and the associated Conditions of Approval uses 'legacy' PCTs, which have since been decommissioned. The legacy PCTs listed in the Concept Plan BDAR have been assigned to their equivalent Revised PCT in the current assessment. The Stage 2 DA will result in direct impacts to:

- 1.95 ha of Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest CEEC (associated with PCT 3320 *Cumberland Shale Plains Woodland* in moderate condition within the subject land).
- 1.19 ha of River-flat Eucalypt Forest on coastal floodplains CEEC (associated with PCT 4025 *Cumberland Red Gum Riverflat Forest* within the subject land).

It should be noted that the project will now result in minor increases in clearing above the approved limits, and updates to the EPBC Act approval are being sought.

Compensation measures for residual impacts to the above listed areas of ecological communities require the retirement of like-for-like ecosystem credits in accordance with clauses 6.2 and 6.6A of the NSW *Biodiversity Conservation Regulation 2017*. As permitted under the Australian Government bilateral agreement with NSW for environmental assessments and endorsement of the NSW BOS as per Appendix A of the EPBC Act Condition-setting Policy 2020. Compensation requires the retirement of:

- 83 ecosystem credits for Cumberland Plain Shale Woodland and Shale-Gravel Transition Forest.
- 38 ecosystem credits for River-flat Eucalypt Forest on coastal floodplains.

Credits are to be retired prior to impacts to the vegetation and are applicable to the proposed Stage 2 development, including any additional credits.

Other requirements include the preparation of a CEMP to be approved by the Commonwealth Minister for the Environment prior to clearing. The CEMP is intended to avoid and mitigate impacts to the retained ecological communities listed under the EPBC Act adjacent to the development footprint, and the CEMP must be consistent with the Environmental Management Plan Guidelines (DCCEW 2024).

11.2 Biodiversity Conservation Act 2016

The BC Act is the key piece of legislation providing for the protection and conservation of biodiversity in NSW through the listing of threatened species and communities and key threatening processes (KTPs). Impacts to threatened species and communities are assessed under Section 7.3 of the BC Act.

Threatened species and communities listed under the BC Act relevant to the subject land are provided in Section 4 and Appendix 2. A summary of impacts to threatened species, populations and communities present or assumed present within the subject land is provided in Section 4.2.5.

The proposed works trigger the BOS under the BC Act due to impacts to BV mapping and exceedance of the clearing threshold, and consideration of the BOS is warranted. This BDAR has been prepared accordingly.

11.3 Fisheries Management Act 1994

The FM Act provides for the protection and conservation of aquatic species and their habitat throughout NSW; via conservation of fish stocks and Key Fish Habitats, and conservation of threatened entities of fish and marine vegetation. Impacts to threatened species, populations and communities, and critical habitats listed under the FM Act must be assessed through an Assessment of Significance process. One of the key objectives of the FM Act is to conserve 'key fish habitats'. Key fish habitats underpin the approach applied by NSW DPI to ensure effort and resources are focused on habitats that are of a high priority to the conservation of fisheries.

NSW DPI is required to assess all projects that involve structures that span the full width of a waterway (including pipe crossings) or modifies the velocity or quantity of water. Under the provisions of the EP&A Act, NSW DPI is an 'approval body' for local development that requires one or more of the following permits under Part 7 the FM Act:

- Section 144 – Aquaculture permit, i.e., cultivating fish or marine vegetation for sale/commercial purposes.
- Section 201 – Permit to carry out works of dredging or reclamation, i.e., any excavation within or filling of water land.
- Section 205 – Permit to harm (cut, remove, damage, destroy, shade etc) marine vegetation (mangroves, seagrass and seaweeds).
- Section 219 – Permit to obstruct the free passage of fish.

In line with the above, under the FM Act, a proponent is required to provide formal notification to Fisheries NSW for dredging and reclamation works within waterways that form Key Fish Habitat; and obtain a permit for works that obstruct free fish passage in any waterway, regardless of Key Fish Habitat status. When reviewing applications, the DPI will assess the likelihood of impacts to waterways in relation to their sensitivity (TYPE) and waterway class (CLASS).

There are no areas mapped as key fish habitat on the *Fisheries NSW Spatial Data Portal* (DPI 2025) within the subject land. If any works associated the project will obstruct fish passage, including the installation of drainage and stormwater infrastructure, a permit may be required under Section 219 of the FM Act.

Threatened aquatic species have not been recorded within 5 kilometres of the study area by the BioNet Atlas of NSW, however two species, Macquarie Perch *Macquaria australasica* and Australian Grayling *Prototroctes maraena* were predicted to occur by the EPBC ACT Predicted Matters Search Tool. Suitable habitat for these species is not present within the subject land and they are considered unlikely to be present. As such, a test of

significant effect on threatened species, populations or ecological communities, or their habitats, as outlined in section 220 of the FM Act is not required.

For detailed description of aquatic habitats within the subject land, refer to Section 2.1.5 of this BDAR.

11.4 Water Management Act 2000

The WM Act provides for the sustainable and integrated management of the state's water. The WM Act is supported by a series of interpretation guidelines which provide design considerations and overarching management measures for works on waterfront land. These considerations and management measures should be considered when planning and undertaking the proposed works. To which the following guidelines are relevant:

- *Guidelines for watercourse crossings on waterfront land* (DPE 2022e).
- *Guidelines for outlet structures on waterfront land* (DPE 2022f).
- *Guidelines for laying pipes and cables in watercourses on waterfront land* (DPE 2022g).
- *Guidelines for riparian corridors on waterfront land* (DPE 2022a).
- *Guidelines for instream works on waterfront land* (DPE 2022h).

Works within 40-metres of the top bank of mapped watercourses will need to be consistent with the riparian corridor matrix which requires a Vegetated Riparian Zone (VRZ) to be preserved. The VRZ buffer applies to each side of the watercourse, measured from top of bank, and is based on the watercourse Strahler order. The buffers required are as follows:

- Strahler order 1 – 10 metre buffer (each side).
- Strahler order 2 – 20 metre buffer (each side).
- Strahler order 3 – 30 metre buffer (each side).
- Strahler order 4 and greater – 40 metre buffer (each side).

Elizabeth Macarthur Creek, a Strahler order 2 watercourse, is present along the eastern boundary of Kellyville SP (Figure 2). The Stage 2 development footprint will encroach on the outer VRZ of this watercourse and may also result in indirect impacts to the inner VRZ. As per offsetting rule in the *Guidelines for riparian corridors on waterfront land* (DPE 2022a), all direct impacts to the outer VRZ must be offset elsewhere within the same reach at a 1:1 ratio to create an average 20 m VRZ width. Further recommendations are provided in the *Kellyville Station Precinct Riparian Assessment* (Eco Logical Australia 2020b), including the preparation of a detailed Vegetation Management Plan (VMP) and a Construction Environmental Management Plan (CEMP) to address impacts of the proposed development on the riparian area.

11.5 Environmental Planning and Assessment Act 1979/Environmental Planning and Assessment Regulation 2021

The EP&A Act was enacted to encourage the proper consideration and management of impacts of proposed development or land-use changes on the environment (both natural and built) and the community. The EP&A Act is administered by NSW DCCEEW.

The EP&A Act provides the overarching structure for planning in NSW and is supported by other statutory environmental planning instruments. Sections of the EP&A Act of primary relevance to the natural environment are outlined further below.

Section 1.7 of the EP&A Act requires proponents and consent authorities to consider if a development will have a significant effect on threatened species, populations or communities listed under the BC Act and FM Act.

Where a development will result in a significant effect to a threatened species, population or community a Species Impact Statement (SIS) or preparation of a BOS application is required. This BDAR has been prepared for the development accordingly.

Threatened species and communities listed under the BC Act relevant to the subject land are provided in Section 4 and Appendix 2. A summary of impacts to threatened species, populations and communities present or assumed present within the subject land is provided in Section 4.2.5.

11.5.1 State Environmental Planning Policies

State Environmental Planning Policy (Biodiversity and Conservation) 2021

Chapter 2: Vegetation in non-rural areas

This chapter aims to protect the biodiversity values of trees and other vegetation in non-rural areas of NSW and to preserve the amenity of non-rural areas through the preservation of trees and other vegetation by ensuring that the BOS will apply to all clearing of native vegetation that exceeds the offset thresholds in urban areas and environmental conservation zones that do not require development consent.

This chapter applies to land zoned RE1, E1, R4 and R3 (as well as Zone R1, Zone R2, Zone SP1) in The Hills Shire LGA as defined in Clause 2.3. Consent is required for clearance of vegetation within land zones and LGAs to which this chapters applies therefore this BDAR meet the requirements of this chapter.

Chapter 3: Koala Habitat Protection 2020

This chapter applies to land zoned RU1, RU2 or RU3. As the proposal occurs on land zoned E1 - Local Centre, SP2 – Stormwater Management System, R1 – General Residential and R4 – High Density Residential this chapter does not apply.

Chapter 4: Koala Habitat Protection 2021

Chapter 4 Koala Habitat Protection aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

The subject land is located within the Hills Shire Council LGA. The Hills Shire Council is not listed under Schedule 2, Chapter 4 of SEPP, and is therefore not subject to the requirements laid out by the policy.

No further consideration is required.

Chapter 13: Strategic conservation planning

This chapter aims to facilitate appropriate development on biodiversity certified land. It requires asset protection zones (APZ) (associated vegetation clearance) to be wholly located on Certified – Urban Capable

Land and the approved mitigation measure be complied with. As the subject land is not located on biodiversity certified land, this chapter does not apply to the project.

Coastal Management Act 2016 and State Environmental Planning Policy (Resilience and Hazards) 2021

Chapter 2: Coastal Management

The State Environmental Planning Policy (Resilience and Hazards) 2021 aims to promote a co-ordinated approach to land use planning in the coastal zone of NSW in a manner consistent with the objects of the *Coastal Management Act 2016* (CM Act).

The CM Act and Resilience and Hazards SEPP provide maps for Coastal Wetlands and associated Proximity Area, Coastal Environment Area and Coastal Use Area. Development consent cannot be granted within these areas unless the Consent Authority is satisfied that the proposed development will not significantly impact on areas mapped as Coastal Wetlands, Coastal Wetlands Proximity Area, Coastal Environment Area, or Coastal Use Area.

The subject land is not within a 'coastal zone' as defined by clause 6 of this policy, including Coastal Wetlands and Coastal Wetlands Proximity Area. Therefore, the CM Act and Resilience and Hazards SEPP does not apply to this project.

11.5.2 The Hills Local Environment Plan 2019

Part 8 of The Hills LEP relates to the Bella Vista and Kellyville Station Precincts. Specifically, Part 8.5 outlines environmental considerations to be addressed by development, which requires the development of a site specific DCP. A Concept Development Application has been prepared and approved which satisfies the requirement for a site-specific development control plan, as allowed for under Clause 4.23 of the EP&A Act.

Clause 8.6 of the LEP outlines the requirements for design excellence within the Bella Vista and Kellyville Station Precincts. Future development applications subject to any concept approval are SSD unless the consent authority delegates the responsibility to Council under section 4.37 of the EP&A Act. To ensure consistency of built form outcomes all future built form applications under the Design Excellence Strategy are to be reviewed by the relevant State Design Review Panel (DRP) which contains members of the Landcom Design Advisory Panel and Council's Design Excellence Panel.

11.5.3 The Hills Development Control Plan 2012

The Hills DCP Part D Section 26 includes specific controls for Bella Vista and Kellyville Station Precincts as amended to the DCP in April 2023. Key considerations for Kellyville SP Stage 2 within SSDA hatched lands defined in the DCP are as follows:

The SSDA applications (SSD-10344, SSD-10343) for a concept master plan, urban design guidelines and Stage 1 subdivision of public open space lots are currently under assessment by the Department of Planning and Environment and are available for viewing on the Department's 'Major Projects' website. Future applications will be required to facilitate further subdivision and the detailed design and construction of buildings, open space, public domain areas and associated civil infrastructure and works.

Under Schedule 2 of the State Environmental Planning Policy (Planning Systems) 2021 (formerly the State Environmental Planning Policy (State and Regional Development) 2011), the following types of development are identified as State Significant Development within the Bella Vista and Kellyville Precincts:

- a) A principal subdivision establishing major lots or public domain areas, or
- b) The creation of new roadways and associated works.

The Environmental Planning and Assessment Act 1979 permits a consent authority, in assessing a concept SSDA, to determine the future stages of development that are to be assessed by Council and that cease to be State Significant. Landcom has requested that the criteria for future applications to be considered State Significant include:

- A principal subdivision establishing major lots or public domain areas;
- The creation of new roadways and associated works; or
- Has a capital investment value of more than \$30 million.

Landcom's Concept SSDAs, including the supporting Urban Design Guidelines, are intended to serve as the primary guiding policy for future development within the SSDA boundaries. The Urban Design Guidelines provide site-specific development controls that future development will be required to comply with and they guide the detailed landscape and architectural design within the approved SSDA open space network, street network, lot structure and building envelopes. The Urban Design Guidelines are also proposed to be supported by a Design Excellence Process, which includes referral to a State Design Review Panel (separate to Council's process) to ensure design quality is maintained through the life of the project (including beyond the initial divestment stage).

The proposed Stage 2 works are within the red hatched SSDA lands as defined by Figure 1 of the DCP and are to be assessed by Council with delegated authority under Section 4.37 of the EP&A Act. Council, as delegated authority, will comply with the Kellyville SP Concept Plan urban design guidelines (SJB Urban 2020b) and associated sub-plans to achieve design excellence and comply with environmental protections for the precinct.

11.6 Biosecurity Act 2015

The *Biosecurity Act 2015* (Biosecurity Act) provides for the identification, classification and control of priority weeds with the purpose of determining if a biosecurity risk is likely to occur. A biosecurity risk is defined as the risk of a biosecurity impact occurring, which for weeds includes the introduction, presence, spread or increase of a pest into or within NSW or any part of the State. A pest plant has the potential to; harm or reduce biodiversity or out-compete other organisms for resources, including food, water, nutrients, habitat and sunlight.

The General Biosecurity Duty as outlined in the Biosecurity Act states:

All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

Five priority weeds for the Greater Sydney Region, which includes the Hills Shire LGA, have been recorded in the subject land and are listed in Table 43, along with their associated Duty.

Table 43 Priority weeds within the subject land

Scientific name	Common name	Relevant biosecurity duty
<i>Asparagus asparagoides</i>	Bridal Creeper	General Biosecurity Duty
<i>Cestrum parqui</i>	Green Cestrum	Regional Recommended Measure Land managers should mitigate the risk of new weeds being introduced to land used for grazing livestock. Land managers should mitigate spread from their land. Plant should not be bought, sold, grown, carried or released into the environment.
<i>Olea europaea</i> subsp. <i>cuspidata</i>	African Olive	Regional Recommended Measure An exclusion zone is established for all lands in Blue Mountains City Council local government area and in Penrith local government area west of the Nepean River. The remainder of the region is classified as the core infestation area. Whole region: The plant or parts of the plant are not traded, carried, grown or released into the environment. Exclusion zone: The plant is eradicated from the land and the land kept free of the plant. Core infestation area: Land managers prevent spread from their land where feasible. Land managers reduce impacts from the plant on priority assets.
<i>Opuntia stricta</i>	Common Prickly Pear	General Biosecurity Duty
<i>Rubus fruticosus</i> species aggregate	Blackberry	General Biosecurity Duty

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Appendices

Appendix 1 Survey methods

Appendix 1.1 Nomenclature

The flora taxonomy (classification) used in this report follows the most recent Flora of NSW (Harden 2002, Harden 1993, Harden 2000, Harden 2002). All doubtful species names were verified with the online Australian Plant Name Index (Australian National Botanic Gardens & Australian National Herbarium 2007). Flora species, including threatened species and introduced flora species, are referred to by both their common and then scientific names when first mentioned. Subsequent references to flora species cite the common names only, unless there is no common name, for which scientific name will be used. Common names, where available, have been included in threatened species tables and the complete flora list in Appendix 3.

Names of vertebrates follow the Census of Australian Vertebrates (CAVs) maintained by the Cth DCCEEW (DSEWPaC 2009). In the body of this report vertebrates are referred to by both their common and scientific names when first mentioned. Subsequent references to these species cite the common name only.

Appendix 1.2 Permits and licences

The biodiversity assessment was conducted under the terms of Biosis' Scientific Licence issued by NSW DCCEEW under the BC Act (SL100758, expiry date 30 June 2026). Wildlife surveys were conducted under the Secretary's Animal Care & Ethics Committee Approval (TRIM 17.892, expiry date 31 January 2028). The BAM Assessment and quality review of the BDAR was carried out by Accredited Assessor Callan Wharfe (BAAS18138).

Appendix 1.3 Limitations

Field surveys were undertaken in accordance with the BAM (DPIE 2020a). Ecological surveys provide a sampling of flora and fauna at a given time and season. Factors influencing detectability of species during survey include species dormancy, seasonal conditions, ephemeral status of waterbodies, and migration and breeding behaviours of some fauna. In many cases, these factors do not present a significant limitation to assessing the overall biodiversity values of a site.

The field survey was conducted in Spring during fair weather, which is a suitable time to determine the presence of most threatened species. However, specific requirements for detecting Magenta Lilly Pilly were not met due to surveys occurring outside the recommended survey period in the TBDC. However, due to the highly conspicuous nature of the species, surveys were considered suitable to reliably detect this species within the subject land.

Surveys undertaken, combined with habitat assessments and desktop analysis are considered sufficient to reach the conclusions herein regarding this and all other species' likelihood of occurrence within the subject land.

Database searches, and associated conclusions on the likelihood of species to occur within the assessment area, are reliant upon external data sources and information managed by third parties.

Appendix 2 BAM Candidate species assessment

Table A 1 Threatened flora species assessment

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Acacia bynoeana</i> Bynoe's Wattle	Vulnerable	Endangered	Species	Semi prostrate shrub growing in central eastern NSW spanning from the Hunter District, west to the Blue Mountains and south to the Southern Highlands. Grows in a variety of communities including; Southern Tableland Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands and Sydney Coastal Heaths. Prefers open, slightly disturbed sites on sandy soils.	Low	No	No	Low	Although there are records of this species within 5 km of the subject land, it typically grows in heath or dry sclerophyll forest, which was not present in the subject land. Due to the absence of suitable habitat for this species, potential for occurrence is low.
<i>Acacia gordonii</i>	Endangered	Endangered	Species	Erect or spreading shrub confined to a disjunct distribution in the Lower Blue Mountains and the Maroota-Glenorie area. Grows on sandstone outcrops and platforms in Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Coastal Heath Swamps, Sydney Coastal Heaths and Sydney Montane Heaths. Grows on shallow soils.	Low	No	No	Negligible	The subject land occurs at the edge of this species distributional range and there are no records within 5 km. Habitat for this species was also not present within the subject land. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Acacia pubescens</i>	Vulnerable	Vulnerable	Species	A spreading shrub primarily confined to the Bankstown-Fairfield-Rookwood area and the Pitt Town area, with outliers at Barden Ridge, Oakdale and Mountain Lagoon. Grows in Cooks/River Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland, usually within roadside and bushland remnants. Grows on shale, sandstone, alluvium and gravely soils, often including ironstone.	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.
<i>Allocasuarina glareicola</i>	Endangered	Endangered	Species	Small, depauperate shrub restricted to a few populations in the Richmond district with an outlier population at Voyager Point in Liverpool. Grows in Castlereagh Woodlands, Cumberland Dry Sclerophyll Forest, Sydney Hinterland Dry Sclerophyll Forest, Sydney Sand Flats Dry Sclerophyll Forests. Grows in lateritic soil.	Low	No	No	Negligible	The subject land occurs at the edge of this species distributional range and there are no records within 5 km. It is known from only a few populations in Richmond, and given the moderate to high weed cover in the subject land, it is unlikely to support habitat for this species. Potential for occurrence is low.
<i>Asterolasia elegans</i>	Endangered	Endangered	Species	Tall, thin shrub found growing north of Sydney in the Baulkham	Low	No	No	Negligible	

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				Hills, Hawkesbury and Hornsby districts. Could also occur in the Goulburn area. Grows in wet sclerophyll forest on moist hillsides in Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests and North Coast Wet Sclerophyll Forests. Grows on Hawkesbury sandstone.					There are no records of this species within 5 km of the subject and suitable habitat in the form of wet sclerophyll forest was not present. Potential for occurrence is low.
<i>Caladenia tessellata</i>	Vulnerable	Endangered	Species	Small orchid recorded from the Wyong, Ulladulla and Braidwood regions with the Kiama and Queanbeyan populations believed to be extinct. Found in a wide variety of communities including Central Gorge Dry Sclerophyll Forests, Cumberland Dry Sclerophyll Forests, Coastal Floodplain Woodlands and Subalpine Woodlands. Grows on clay loam or sandy soils.	Low	No	No	Negligible	The subject land occurs at the edge of this species distributional range and there are no records within 5 km. Habitat for this species was also not present within the subject land. Potential for occurrence is low.
<i>Cryptostylis hunteriana</i> Leafless Tongue Orchid	Vulnerable	Vulnerable	Species	Orchid with a distribution spanning from Gibraltar Range National Park southwards to the coastal area near Orbost in Victoria. Grows in a variety of communities including Sydney Coastal Dry Sclerophyll Forests, Coastal Heath Swamps, New England Dry Sclerophyll Forests and Sydney Coastal Heaths. Grows in sandy soils.	Low	No	No	Negligible	There are no records of this species within 5 km of the subject and vegetation typically associated with this species was not recorded in the subject land. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Cynanchum elegans</i> White-flowered Wax Plant	Endangered	Endangered	Species	Climbing vine restricted to eastern NSW from Brunswick Heads to Gerroa in the Illawarra region. Grows in rainforest gully scrub and scree slope on the edge of dry rainforests in a variety of communities including Coastal Floodplain Wetlands, Maritime Grasslands, Coastal Valley Grassy Woodlands and Northern Hinterland Wet Sclerophyll Forests.	Low	No	No	Negligible	Although this species is associated with a variety of vegetation communities, some of which are present within the subject land, it is largely found growing in or on the edge of rainforest vegetation. In addition, there are no records of this species within 5 km of the subject. Potential for occurrence is low.
<i>Darwinia biflora</i>	Vulnerable	Vulnerable	Species	Erect shrub distributed in the Ku-ring-gai, Hornsby, Baulkham Hills and Ryde local government areas. Grows on edges of weathered shale capped ridges in the vicinity of an intergrade with Hawkesbury sandstone in Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests and Sydney Coastal Heaths. Grows in shale-sandstone transitional soils.	Low	No	No	Low	Although there are over 400 records of this species within 5 km of the subject land, it does not occur in The Hills Shire LGA. Vegetation that represents suitable habitat for this species was not recorded in the subject land. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Deyeuxia appressa</i>	Endangered	Endangered	Species	Erect, perennial grass, endemic to NSW. Restricted to two records, one in 1930 at Herne Bay south of Bankstown and the other in 1941 from Killara near Hornsby. Grows on wet ground in Sydney Coastal Dry Sclerophyll Forests and Eastern Riverine Forests.	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.
<i>Dillwynia tenuifolia</i>	Not Listed	Endangered Population	Species	Low, spreading shrub restricted to the Cumberland Plain in Western Sydney. Grows in scrubby or heathy areas within a variety of communities including Castlereagh Ironbark Forest, Shale Gravel Transition Forest, Castlereagh Scribbly Gum Woodland and Sydney Hinterland Dry Sclerophyll Forests. Grows on tertiary alluvium, laterised clays and in shale-sandstone transitions. An endangered population of this species occurs at Kemps Creek, in the Greater Sydney Area.	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.
<i>Eucalyptus benthamii</i>	Vulnerable	Critically Endangered	Species	The Camden White Gum is a large tree species which grows	Moderate	Yes	Yes	Low	

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				on deep alluvial sandy soils. This eucalypt is known from two major subpopulations; one in the Kedumba Valley of the Blue Mountains National Park, and the other in Bents Basin State Recreation Area.					Although this species is associated with the vegetation communities recorded in the subject land, there are no records within 5 km and the subject land occurs on the edge of the distribution range for this species. Habitat for threatened flora was considered to be largely degraded. This species was not recorded during targeted surveys.
<i>Eucalyptus glaucina</i> Slaty Red Gum	Vulnerable	Vulnerable	Species	Medium sized tree, confined to the north coast of NSW at Casino as well as Taree to Broke, west of Maitland. Grows in a variety of communities including Hunter - Macleay Dry Sclerophyll Forests, Coastal Floodplain Wetlands, Northern Hinterland Wet Sclerophyll Forests and Coastal Valley Grassy Woodlands. Grows on deep, moderately fertile, well watered soils.	Moderate	Yes	Yes	Low	The subject land occurs at the edge of this species distributional range and there are no records within 5 km. This species was not recorded during targeted surveys.
<i>Eucalyptus nicholii</i>	Vulnerable	Vulnerable	Species		Low	No	No	Negligible	

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
Narrow-leaved Black Peppermint				Medium sized tree, sparsely distributed from Nundle through to the north of Tenterfield, also in urban tree plantings. Grows on slopes and ridges in a variety of communities including New England Dry Sclerophyll Forests, Western Slopes Dry Sclerophyll Forests, New England Grassy Woodlands and Tableland Clay Grassy Woodlands. Grows on shallow, infertile soils on shale substrates.					The subject land occurs outside the distributional range for this species and there are no records within 5 km. Suitable habitat was not recorded in the subject land. Potential for occurrence is low.
<i>Eucalyptus sp. Cattai</i>	Critically Endangered	Critically Endangered	Species	Small tree or mallee distributed between Colo Heights and Castle Hill in north-western Sydney. Grows as an emergent tree on flats and ridgetops in Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests and Sydney Coastal Heaths. Grows on sandstone substrates in laterised clays and occasionally on sandy soils.	Low	No	No	Negligible	There are no records of this species within 5 km of the subject and vegetation typically associated with this species was not recorded in the subject land. Potential for occurrence is low.
<i>Genoplesium baueri</i>	Endangered	Endangered	Species	Terrestrial orchid with 13 populations totalling 200 plants	Low	No	No	Negligible	

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
Bauer's Midge Orchid				distributed between Ulladulla and Port Stephens. Grows on moss gardens in a variety of communities including Sydney Coastal Dry sclerophyll Forests, Sydney Coastal Heaths, Sydney Montane Heaths, Southern Lowland Wet Sclerophyll Forests and Sydney Hinterland Dry Sclerophyll Forests. Grows on sandstone substrates					There are no records of this species within 5 km of the subject and vegetation typically associated with this species was not recorded in the subject land. Potential for occurrence is low.
<i>Grevillea juniperina subsp. juniperina</i> Juniper-leaved Grevillea	Not Listed	Vulnerable	Species	Spreading to erect medium sized shrub endemic to Western Sydney with a distribution spanning from Blacktown, Erskine Park, Londonderry and Windsor and outlying populations at Kemps Creek and Pitt Town. Grows at elevations <50 m in Cumberland Plain Woodland, Castlereagh Ironbark Forest, Castlereagh Scribbly Gum Woodland, Shale/Gravel Transition Forest, Sydney Sand Flats Dry Sclerophyll Forests and Coastal Valley Grassy Woodlands. Grows in sandy to clay loam soils and red pseudolateritic gravels derived from Wianamatta Shale and Tertiary Alluvium.	Low	No	No	Low	Although this species has been recorded within 5 km of the subject land and is found growing in Cumberland Plain Woodland, habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Haloragis exalata subsp. exalata</i>	Vulnerable	Vulnerable	Species	Small to medium sized shrub	Low	No	No	Negligible	The subject land

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
Square Raspwort				found growing in four widely scattered locations in eastern NSW including the central coast, south coast and north western slopes. Grows in damp, protected and shaded areas in riparian zones in a variety of communities including South East Dry Sclerophyll Forests, Coastal Floodplain Wetlands, Montane Bogs and Fens and Northern Warm Temperate Rainforests.					occurs outside the distributional range for this species and there are no records within 5 km. Potential for occurrence is low.
<i>Haloragodendron lucasii</i>	Endangered	Endangered	Species	Erect shrub restricted to a very narrow distribution on the north shore of Sydney. Grows on sheltered aspects and gentle slopes below cliff lines adjacent to creeks in Sydney Coastal Dry Sclerophyll Forests, Sydney Montane Dry Sclerophyll Forests, Eastern Riverine Forests, Sydney Coastal Heaths and Sydney Montane Heaths. Grows on sandstone substrates in moist, loamy soil containing high levels of phosphorous.	Low	No	No	Negligible	The subject land occurs on the edge of the distributional range for this species and there are no records within 5 km. Suitable habitat was not recorded in the subject land. Potential for occurrence is low.
<i>Hibbertia puberula</i>	Not Listed	Endangered	Species		Moderate	Yes	Yes	Low	

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				Shrublet with a distribution extending from Wollemi National Park south to Morton National Park and the south coast near Nowra. Grows in a variety of communities including Southern Tableland Dry Sclerophyll Forests, Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Coastal Heath Swamps, Coastal Valley Grassy Woodlands and Sydney Coastal Heaths. Grows on sandy soils, occasionally on clay soils.					Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.
<i>Hibbertia</i> sp. <i>Bankstown</i> (EPBC Act listing - <i>Hibbertia puberula</i> subsp. <i>Glabrescens</i>)	Critically Endangered	Critically Endangered	Species	Prostrate shrub with one population restricted to Bankstown Airport. Grows in a highly modified habitat with surrounding native vegetation composition reminiscent of Castlereagh Ironbark Forest or Castlereagh Scribbly Gum Woodland and associated with Cumberland Dry Sclerophyll Forests, Sydney Sand Flats Dry Sclerophyll Forests, and Coastal Floodplain Wetlands. Grows in sandy tertiary alluvial soils with a high silt content.	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.
<i>Lasiopetalum</i> <i>joyceae</i>	Vulnerable	Vulnerable	Species	Erect, medium sized shrub restricted to 34 sites within the	Low	No	No	Negligible	There are no records

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				Hornsby Plateau from Berrilee to Duffys Forest. Grows on lateritic or shale influenced ridgetops in Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests and Sydney Coastal Heaths. Grows on sandstone substrates.					of this species within 5 km of the subject land and vegetation typically associated with this species was not recorded in the subject land. Potential for occurrence is low.
<i>Macadamia integrifolia</i> Macadamia Nut	Vulnerable	Not Listed	Species	Medium sized tree found growing from Mount Bauple, near Gympie to Currumbin Valley in the Gold Coast hinterland in south-east Queensland. Occurs in the Northern Rivers region of NSW in remnant rainforest, mixed notophyll forest and rainforest margins.	Low	No	No	Negligible	Although this species has been recorded within 5 km of the subject land, suitable habitat and vegetation communities associated with this species was not recorded in the subject land. Potential for occurrence is low.
<i>Marsdenia viridiflora</i> subsp. <i>viridiflora</i> - endangered population	Not Listed	Endangered Population	Species	Slender climber with twining stems with a scattered distribution within the Prospect, Bankstown, Smithfield, Cabramatta Creek, St Mary's and north from Razorback Range. Grows in vine thickets and open shale woodland in a variety of communities including Cumberland Dry Sclerophyll Forests, Coastal Floodplains Wetlands, Coastal Valley Grassy Woodlands and Dry Rainforests.	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Maundia triglochinos</i>	Not Listed	Vulnerable	Species	Perennial sedge restricted to coastal NSW from Wyong extending northwards to southern Queensland. Grows in shallow freshwater channels, lagoons, creeks, dams or swamps in a variety of communities including Coastal Floodplain Wetlands, Coastal Swamp Forests, Coastal Freshwater Lagoons, Coastal Heath Swamps and Coastal Valley Grassy Woodlands. Grows in heavy clay, low nutrient soils.	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.
<i>Micromyrtus minutiflora</i>	Vulnerable	Endangered	Species	Slender, spreading shrub restricted to the western edge of the Cumberland Plain between Richmond and Penrith. Grows in Cumberland Dry Sclerophyll Forests and Sydney Sand Flats Dry Sclerophyll Forests including Castlereagh Scribbly Gum Woodlands, Castlereagh Ironbark Forests, and Shale/Gravel Transition Forests. Grows in tertiary alluvium and consolidated river sediments.	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Persicaria elatior</i> Tall Knotweed	Vulnerable	Vulnerable	Species	Erect herb found growing in south-eastern NSW at Moutn Dromedary, Moruya State Forest near Turlinjah, Upper Avon River catchment north of Robertson, Bermagui and Picton Lakes. Also grows in northern NSW around Raymond Terrace near Newcastle and Cherry Tree and Gibberagee State Forests in the Grafton area. Grows in damp places usually on the margins of waterbodies and in swamp forests in a variety of communities including Coastal Floodplain Wetlands, Coastal Swamp Forests, Eastern Riverine Forests, Coastal Freshwater Lagoons and Coastal Heath Swamps.	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Persoonia nutans</i> Nodding Geebung	Endangered	Endangered	Species	Erect or spreading shrub with a disjunct distribution restricted to the Cumberland Plain between Richmond in the north and Macquarie Fields in the south with core distribution occurring in the Penrith and to a lesser extent, Hawkesbury regions. Grows in Cumberland Dry Sclerophyll Forests including Agnes Banks Woodland, Castlereagh Scribbly Gum Woodland, Cooks River/Castlereagh Ironbark Forest and Shale-Sandstone Transition Forest as well as Sydney Sand Flats Dry Sclerophyll Forests and Coastal Valley Grassy Woodlands. Grows in sandy soils derived from aeolian or alluvial sediments as well as in tertiary alluviums to the south of its range.	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Pimelea spicata</i> Spiked Rice-flower	Endangered	Endangered	Species	Small erect or spreading shrub with populations occurring in two disjunct areas, one occurring on the Cumberland Plain from Marayong and Prospect Reservoir south to Narellan and Douglas Park, and the other occurring in the Illawarra from Landsdowne to Shellharbour and north Kiama. Grows in Maritime Grasslands and Coastal Valley Grassy Woodlands including Cumberland Plain Woodlands and Moist Shale Woodlands within the Cumberland Basin and in Coast Banksia Open Woodland Coastal Grasslands in the Illawarra region. Grows on well structured clay soils.	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not recorded during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Pterostylis gibbosa</i> Illawarra Greenhood	Endangered	Endangered	Species	Deciduous terrestrial orchid with a disjunct distribution from the Milbrodale in the Hunter Region, Albion Park and Yallah in the Illawarra Region and Nowra in the Shoalhaven Region. Found growing amongst grasses on flat or gently sloping land with poor drainage in woodland dominated by Forest Red Gum Eucalyptus tereticornis, Woollybutt E. longifolia, and White Feather Honey-myrtle Melaleuca decora. In Nowra, the orchid can be found growing in association with Spotted Gum Corymbia maculata, Forest Red Gum and Grey Ironbark E. paniculata. In the Hunter Region, the orchid is associated with Narrow-leaved Ironbark E. crebra, Forest Red Gum and Black Cypress Pine Callitris endlicheri. Grows in red brown loam soils.	Low	No	No	Negligible	The subject land occurs on the edge of the distributional range for this species and there are no records within 5 km. Although this species is associated with some of the canopy trees recorded in the subject land, habitat for threatened species was considered degraded. Potential for occurrence is low.
<i>Pultenaea parviflora</i>	Vulnerable	Endangered	Species	Small erect, branching shrub endemic to the Cumberland Plain from Windsor to Penrith east to Dean Park with outlying populations at Kemps Creek and Wilberforce. Found growing in Cumberland Dry Sclerophyll Forests including Castlereagh Ironbark Forest, Shale Gravel Transition Forest and Castlereagh Scribbly Gum Woodland, Sydney	Moderate	Yes	Yes	Low	Although this species is associated with the vegetation communities recorded in the subject land, habitat for threatened flora was largely considered degraded. This species was not

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				Coastal Dry Sclerophyll Forests, Sydney Sand Flats Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands and Southern Lowland Wet Sclerophyll Forests. Grows in soils derived from Wianamatta shale, laterite or alluvium.					recorded during targeted surveys.
<i>Rhizanthella slateri</i> Eastern Australian Underground Orchid	Endangered	Vulnerable	Species	Terrestrial orchid with a distribution spanning from south-east NSW to south-east Queensland. Recorded in ten populations in NSW including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wisemans Ferry Area, Agnes Banks and near Nowra. A cryptic species which grows beneath the soil surface with flowers being the only part of the plant to occur aboveground in Sydney Sand Flats Dry Sclerophyll Forests, Eastern Riverine Forests, Northern Warm Temperate Rainforests, North Coast Wet Sclerophyll Forests, Northern Hinterland Wet Sclerophyll Forests and Southern Lowland Wet Sclerophyll Forests. Grows in deep loam soils.	Low	No	No	Negligible	The subject land occurs on the edge of the distributional range for this species and there are no records within 5 km. It is known from only 10 populations in NSW and is typically associated with sclerophyll forest, which was not recorded in the subject land. Potential for occurrence in low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Rhodomyrtus psidioides</i> Native Guava	Critically Endangered	Critically Endangered	Species	Shrub or small tree which typically grows to 12 metres high. Populations are typically restricted to coastal regions of low elevation between Sydney and Maryborough, Queensland. Often found in littoral, warm temperate and subtropical rainforests and wet sclerophyll forests near creeks and drainage lines. This species is known to be particularly susceptible to myrtle rust.	Low	No	No	Negligible	The subject land occurs on the edge of the distributional range for this species and there are no records within 5 km. It typically occurs in rainforest vegetation, which was not recorded in the subject land. Potential for occurrence is low.
<i>Thesium australe</i> Austral Toadflax	Vulnerable	Vulnerable	Species	Small, straggling herb with a distribution comprising of small populations scattered along the coast of eastern NSW including the Northern and Southern Tablelands, Tasmania, Queensland and eastern Asia. A root parasite found growing on damp sites in grassland, grassy woodlands and coastal headlands often in association with Kangaroo Grass Themeda triandra in a variety of communities including New England Dry Sclerophyll Forests, Western Slopes Grasslands, Northern Tableland Wet Sclerophyll Forests, Brigalow Clay Plain Woodlands, Subalpine Woodlands and Maritime Grasslands.	Low	No	No	Negligible	The subject land occurs outside of the distributional range for this species and there are no records within 5 km. It typically grows in association with Kangaroo Grass, which was not recorded in the subject land. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Zieria involuocrata</i>	Vulnerable	Endangered	Species	Small, erect shrub with a disjunct distribution north and west of Sydney in the Baulkham Hills, Hawkesbury, Hornsby and Blue Mountains Local Government Areas primarily in the Macdonald, Colo, and Hawkesbury River Catchments. Found growing on mid to lower slopes and valleys or adjacent to gullies in Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Southern Lowland Wet Sclerophyll Forests and North Coast Wet Sclerophyll Forests. Grows on Hawkesbury or Narrabeen sandstone or Quaternary alluvium substrates.	Low	No	No	Negligible	The subject land occurs on the edge of the known distributional range for this species and there are no records within 5 km. Although it has been recorded in several LGAs in the Sydney and Western Sydney regions, it grows in wet and dry sclerophyll forest communities, which were not recorded in the subject land. Potential for occurrence is low.

Table A 2 Threatened fauna species assessment

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
Birds									
<i>Anthochaera phrygia</i> Regent Honeyeater	Critically Endangered	Critically Endangered	Species/ Ecosystem	Regent Honeyeaters are semi-nomadic, occurring in temperate eucalypt woodlands and open forests. Most records are from box-ironbark eucalypt forest associations and wet lowland coastal forests. Nectar and fruit from mistletoes are also eaten. This species usually nest in tall mature eucalypts and sheoaks.	Low	No	N/A	Negligible	No mapped Important Habitat is present within the subject land (NSW DCCEEW 2025d). Potential for occurrence is low.
<i>Aphelocephala leucopsis</i> Southern Whiteface	Vulnerable	Vulnerable	N/A	Southern whitefaces occupy open acacia or eucalypt-dominated woodlands and shrublands on ranges, foothills, lowlands, and plains. This species favours open woodlands and shrublands with low tree densities and a herbaceous litter cover or grassy understory.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land, and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Artamus cyanopterus cyanopterus</i> Dusky Woodswallow	Not Listed	Vulnerable	Ecosystem	Primarily inhabits dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands,	Low	No	N/A	Negligible	Although this species has been recorded within 5 km of the subject land, it has a very wide distribution. Due to the nature of the site and condition of vegetation, suitable habitat for this

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.					species was largely not present. Potential for occurrence is low.
<i>Botaurus poiciloptilus</i> Australasian Bittern	Endangered	Endangered	Ecosystem	The Australasian Bittern is distributed across south-eastern Australia. Often found in terrestrial and estuarine wetlands, generally where there is permanent water with tall, dense vegetation including Typha spp. and Eleocharis spp.. Typically this bird forages at night on frogs, fish and invertebrates, and remains inconspicuous during the day. The breeding season extends from October to January with nests being built amongst dense vegetation on a flattened platform of reeds.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land, and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Burhinus grallarius</i> Bush Stone-curlew	Not Listed	Endangered	Species	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Occrrs in lightly timbered open forest and woodland, or partly cleared farmland with remnants of	Moderate	Yes	Yes	Low	Species was not recorded in the subject land during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				woodland, with a ground cover of short sparse grass and few or no shrubs where fallen branches and leaf litter are present.					
<i>Calidris acuminata</i> Sharp-tailed Sandpiper	Vulnerable	Not Listed	N/A	This species is a migratory visitor to Australia, and spends its breeding season in Siberia. In the non-breeding season, the Sharp-tailed Sandpiper is known to occur mostly in the south-east of Australia, but has been found on coastlines all throughout the country.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land, and it is a migratory shorebird that breeds outside of Australia and forages in coastal environments, such as wetlands and mudflats. Potential for occurrence is low.
<i>Calidris ferruginea</i> Curlew Sandpiper	Critically Endangered	Endangered	Species/Ecosystem	Inhabits sheltered intertidal mudflats. Also non-tidal swamps, lagoons and lakes near the coast. Infrequently recorded inland.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land, and it is a migratory species that inhabits in coastal environments, such as swamps and mudflats. Potential for occurrence is low.
<i>Callocephalon fimbriatum</i> Gang-gang Cockatoo	Endangered	Endangered	Species/Ecosystem	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine Snow Gum	Moderate	Yes	Yes	Low	Species was not recorded in the subject land during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed.					
<i>Calyptrorhynchus lathamii lathamii</i> South-Eastern Glossy Black-Cockatoo	Vulnerable	Vulnerable	Species/Ecosystem	Inhabits forest with low nutrients, characteristically with key Allocasuarina species. Tends to prefer drier forest types. Often confined to remnant patches in hills and gullies. Breed in hollows stumps or limbs, either living or dead.	Moderate	Yes	Yes	Low	Species was not recorded in the subject land during targeted surveys.
<i>Charadrius leschenaultii</i> Greater Sand-plover	Vulnerable	Vulnerable	Species/Ecosystem	Entirely coastal in NSW, foraging on intertidal sand and mudflats in estuaries and roosting during high tide on sandy beaches or rocky shores. Individuals have been recorded on inshore reefs, rock platforms, small rocky islands and sand cays on coral reefs, within Australia. Occasional sightings have also occurred on near-coast saltlakes, brackish swamps, shallow freshwater wetlands and grassed paddocks.	Low	No	N/A	Negligible	This is a migratory species that occurs entirely in coastal environments in NSW. There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Chthonicola sagittata</i> Speckled Warbler	Not Listed	Vulnerable	Ecosystem	Chthonicola sagittata occurs on the hills and tablelands of the Great Dividing Range. Found in eucalypt and cypress woodlands with a grassy understorey, often on ridges or gullies. The species nests on the ground in grass tussocks, dense litter and fallen branches. They forage on the ground for arthropods and seeds.	Low	No	N/A	Low	No suitable habitat present within the subject land.
<i>Circus assimilis</i> Spotted Harrier	Not Listed	Vulnerable	Ecosystem	The Spotted Harrier is found throughout Australia but rarely in densely forested and wooded habitat of the escarpment and coast. Preferred habitat consists of open and wooded country with grassland nearby for hunting. Habitat types include open grasslands, acacia and mallee remnants, spinifex, open shrublands, saltbush, very open woodlands, crops and similar low vegetation. The Spotted Harrier is more common in drier inland areas, nomadic part migratory and dispersive, with movements linked to the abundance of prey species. Nesting occurs in open or remnant woodland and unlike other harriers, the Spotted Harrier nests in trees.	Low	No	N/A	Low	Highly limited suitable habitat present within the subject land or surrounds.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Climacteris picumnus victorae</i> Brown Treecreeper (eastern subspecies)	Vulnerable	Vulnerable	Ecosystem	Lives in eucalypt woodlands, especially areas of relatively flat open woodland typically lacking a dense shrub layer, with short grass or bare ground and with fallen logs or dead trees present.	Low	No	N/A	Low	Highly limited suitable habitat present within the subject land or surrounds.
<i>Daphoenositta chrysoptera</i> Varied Sittella	Not Listed	Vulnerable	Ecosystem	The Varied Sittella is a sedentary species which inhabits a wide variety of dry eucalypt forests and woodlands, usually with either shrubby understorey or grassy ground cover or both, in all climatic zones of Australia. Usually inhabit areas with rough-barked trees, such as stringybarks or ironbarks, but also in mallee and acacia woodlands, paperbarks or mature Eucalypts. The Varied Sittella feeds on arthropods gleaned from bark, small branches and twigs. It builds a cup-shaped nest of plant fibres and cobweb in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.	Low	No	N/A	Low	Highly limited suitable habitat present within the subject land or surrounds.
<i>Ephippiorhynchus asiaticus</i> Black-necked Stork	Not Listed	Endangered	Ecosystem	Found in swamps, mangroves and mudflats. Can also occur in dry floodplains and irrigated lands and occasionally forages	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				in open grassy woodland. Nests in live or dead trees usually near water.					important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Epthianura albifrons</i> White-fronted Chat	Not Listed	Vulnerable	Ecosystem	Sydney Metropolitan CMA: The White-fronted Chat occupies foothills and lowlands below 1000 m above sea level. In NSW it occurs mostly in the southern half of the state, occurring in damp open habitats along the coast, and near waterways in the western part of the state. The White-fronted Chat is found in damp open habitats, particularly wetlands containing saltmarsh areas that are bordered by open grasslands or lightly timbered lands. Along the coastline, they are found in estuarine and marshy grounds with vegetation less than 1 m tall. The species is also observed in open grasslands and sometimes in low shrubs bordering wetland areas. Inland, the species is often observed in open grassy plains, saltlakes and saltpans that are along the margins of rivers and waterways. In	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				Victoria White-fronted Chats have been observed breeding from late July through to early March. Nests are built in low vegetation and in the Sydney region nests have also been observed in low isolated mangroves. An Endangered Population occurs in the Sydney Metropolitan CMA area, at Newington Nature Reserve near Homebush and at Towra Point Nature Reserve.					
<i>Erythroriorchis radiatus</i> Red Goshawk	Endangered	Critically Endangered	Species	Occur in forest and woodland habitat near permanent water. In NSW prefer Melaleuca swamp forest and open eucalypt woodland. Require greater than 20 m tall trees for nesting.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Falco subniger</i> Black Falcon	Not Listed	Vulnerable	Ecosystem	Mainly occur in woodlands and open country where can hunt. Often associated with swamps, rivers and wetlands. Nest in tall trees along watercourses.	Low	No	N/A	Low	Highly limited suitable habitat present within the subject land or surrounds.
<i>Gallinago hardwickii</i> Latham's Snipe	Vulnerable	Vulnerable	N/A	Typically found on wet soft ground or shallow water with good cover of tussocks. Often found in wet paddocks, seepage areas below dams.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
									important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Glossopsitta pusilla</i> Little Lorikeet	Not Listed	Vulnerable	Ecosystem	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 m and 15 m, mostly in living, smooth-barked eucalypts. Most breeding records come from the western slopes.	Low	No	N/A	Low	Limited suitable habitat present within the subject land or surrounds.
<i>Grantiella picta</i> Painted Honeyeater	Vulnerable	Vulnerable	Ecosystem	Found mainly in dry open woodlands and forests, where it is strongly associated with mistletoe. Often found on plains with scattered eucalypts and remnant trees on farmlands.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
									occurrence is low.
<i>Haliaeetus leucogaster</i> White-bellied Sea-Eagle	Not Listed	Vulnerable	Species/Ecosystem	A migratory species that is generally sedentary in Australia, although immature individuals and some adults are dispersive. Found in terrestrial and coastal wetlands; favouring deep freshwater swamps, lakes and reservoirs; shallow coastal lagoons and saltmarshes. It hunts over open terrestrial habitats. Feeds on birds, reptiles, fish, mammals, crustaceans and carrion. Roosts and makes nest in trees.	Moderate	Yes	Yes	Low	Species was not recorded in the subject land during targeted surveys.
<i>Hieraaetus morphnoides</i> Little Eagle	Not Listed	Vulnerable	Species/Ecosystem	The Little Eagle is most abundant in lightly timbered areas with open areas nearby providing an abundance of prey species. It has often been recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. The Little Eagle nests in tall living trees within farmland, woodland and forests.	Moderate	Yes	Yes	Low	Species was not recorded in the subject land during targeted surveys.
<i>Hirundapus caudacutus</i> White-throated Needletail	Vulnerable	Vulnerable	Ecosystem	An aerial species found in feeding concentrations over cities, hilltops and timbered ranges. This species roosts in trees in forests and woodlands	Low	No	N/A	Negligible	Highly limited suitable habitat present within the subject land or surrounds.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				and feeds on insects. The White-throated Needletail breeds in forests and sparse hills in Asia.					
<i>Irediparra gallinacea</i> Comb-crested Jacana	Not Listed	Vulnerable	Ecosystem	Occurs in freshwater wetlands, lagoons, Billabongs, swamps, lakes, rivers and reservoirs, generally with abundant floating aquatic vegetation.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Ixobrychus flavicollis</i> Black Bittern	Not Listed	Vulnerable	Ecosystem	The Black Bittern is found along the coastal plains within NSW, although individuals have rarely being recorded south of Sydney or inland. It inhabits terrestrial and estuarine wetlands such as flooded grasslands, forests, woodlands, rainforests and mangroves with permanent water and dense waterside vegetation. The Black Bittern typically roosts on the ground or in trees during the day and forages at night on frogs, reptiles, fish and invertebrates. The breeding season extends from December to March. Nests are constructed of reeds	Low	No	N/A	Low	There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				and sticks in branches overhanging the water.					
<i>Lathamus discolor</i> Swift Parrot	Critically Endangered	Endangered	Species/Ecosystem	The Swift Parrot occurs in woodlands and forests of NSW from May to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW. Favoured feed trees include winter flowering species such as Swamp Mahogany <i>Eucalyptus robusta</i> , Spotted Gum <i>Corymbia maculata</i> , Red Bloodwood <i>C. gummifera</i> , Mugga Ironbark <i>E. sideroxylon</i> , and White Box <i>E. albens</i> . Commonly used lerp infested trees include Grey Box <i>E. microcarpa</i> , Grey Box <i>E. moluccana</i> and Blackbutt <i>E. pilularis</i> . This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability.	Low	No	N/A	Low	No mapped Important Habitat is present within the subject land (NSW DCCEE 2025d). Potential for occurrence is low
<i>Limosa limosa</i> Black-tailed Godwit	Endangered	Vulnerable	Species/Ecosystem	The Black-tailed Godwit is a migratory wading bird that breeds in Mongolia and Eastern Siberia and flies to Australia for the southern summer, arriving in August and leaving in March. In NSW,	Low	No	N/A	Negligible	This is a migratory species that travels to Australia in the summer, typically found in parts of the Hunter River estuary.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				it is most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the coast, and inland. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed. The species has been recorded within the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state.					There are no records within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low
<i>Lophoictinia isura</i> Square-tailed Kite	Not Listed	Vulnerable	Species/Ecosystem	Typically inhabits coastal forested and wooded lands of tropical and temperate Australia. In NSW it is often associated with ridge and gully forests dominated by <i>Eucalyptus longifolia</i> , <i>Corymbia maculata</i> , <i>E. elata</i> , or <i>E. smithii</i> . Individuals appear to occupy large hunting ranges of more than 100 km ² . They require large living trees for breeding, particularly near water with surrounding woodland /forest close by for foraging habitat. Nest sites are generally located along or near	Moderate	Yes	Yes	Low	Species was not recorded in the subject land during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				watercourses, in a tree fork or on large horizontal limbs.					
<i>Melanodryas cucullata cucullata</i> South-eastern Hooded Robin, Hooded Robin (south-eastern)	Endangered	Endangered	Ecosystem	This species lives in a wide range of temperate woodland habitats, and a range of woodlands and shrublands in semi-arid areas.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Melithreptus gularis gularis</i> Black-chinned Honeyeater (eastern subspecies)	Not Listed	Vulnerable	Ecosystem	Found mostly in open forests and woodlands dominated by box and ironbark eucalypts. It is rarely recorded east of the Great Dividing Range.	Low	No	N/A	Negligible	Highly limited suitable habitat present within the subject land or surrounds.
<i>Neophema chrysostoma</i> Blue-winged Parrot	Vulnerable	Not Listed	N/A	The Blue-winged Parrot is a small parrot found in Tasmania and southeast mainland Australia. Some populations are known to migrate to Tasmania from the mainland during summer months. The species feeds predominantly on the ground, and occurs in savannah woodlands and grasslands.	Low	No	N/A	Negligible	Although this species has been recorded within 5 km of the subject land, habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Neophema pulchella</i> Turquoise Parrot	Not Listed	Vulnerable	Ecosystem	Occurs in open woodlands and eucalypt forests with a ground cover of grasses and understorey of low shrubs. Generally found in the foothills	Low	No	N/A	Negligible	Although this species has been recorded within 5 km of the subject land, habitat features important for

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				of the Great Divide, including steep rocky ridges and gullies. Nest in hollow-bearing trees, either dead or alive; also in hollows in tree stumps. Prefer to breed in open grassy forests and woodlands, and gullies that are moist.					this species were not recorded during field investigations. Potential for occurrence is low.
<i>Ninox connivens</i> Barking Owl	Not Listed	Vulnerable	Species	Generally found in open forests, woodlands, swamp woodlands, farmlands and dense scrub. Can also be found in the foothills and timber along watercourses in otherwise open country. Territories are typically 2000 ha in NSW habitats. Hunts small arboreal mammals or birds and terrestrial mammals when tree hollows are absent.	Moderate	Yes	Yes	Low	Species was not recorded in the subject land during targeted surveys.
<i>Ninox strenua</i> Powerful Owl	Not Listed	Vulnerable	Species	The Powerful Owl occupies wet and dry eucalypt forests and rainforests. It may inhabit both un-logged and lightly logged forests as well as undisturbed forests where it usually roosts on the limbs of dense trees in gully areas. Large mature trees with hollows at least 0.5 m deep are required for nesting. Tree hollows are particularly important for the Powerful Owl because a large proportion of the diet is made up of hollow-dependent	Moderate	Yes	Yes	Low	Species was not recorded in the subject land during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				arboreal marsupials. Nest trees for this species are usually emergent with a diameter at breast height of at least 100 cm. It has a large home range of between 450 and 1450 ha.					
<i>Numenius madagascariensis</i> Eastern Curlew	Critically Endangered	Not Listed	Species/Ecosystem	Occurs in sheltered coasts, especially estuaries, embayments, harbours, inlets and coastal lagoons with large intertidal mudflats or sandflats often with beds of seagrass.	Low	No	N/A	Negligible	This is a migratory species that occurs in coastal habitats and there are no records within 5 km of the subject land. Habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Oxyura australis</i> Blue-billed Duck	Not Listed	Vulnerable	Ecosystem	The Blue-billed Duck is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. It is generally only seen in coastal areas during summer. Prefers large permanent wetlands, feeding on the bottom of swamps.	Low	No	N/A	Low	There are no records of this species within 5 km. Habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Pandion cristatus</i> Eastern Osprey, Australian Osprey	Not Listed	Vulnerable	Species/Ecosystem	Found in coastal waters, inlets, estuaries and offshore islands. Occasionally found 100 km inland along larger rivers. It is water-dependent, hunting for fish in clear, open water. The Osprey occurs in terrestrial wetlands, coastal lands and offshore islands. It is a predominantly coastal species, generally using marine cliffs as nesting and roosting sites. Nests can also be made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	Low	Yes	Yes	Low	This species occurs in coastal habitats and there are no records within 5 km of the subject land. Habitat features important for this species were not recorded during field investigations. Potential for occurrence is low. Not recorded during targeted survey.
<i>Petroica boodang</i> Scarlet Robin	Not Listed	Vulnerable	Ecosystem	The Scarlet Robin inhabits dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. During autumn and winter it moves to more open and cleared areas. The Scarlet Robin forages amongst logs and woody debris for insects. The nest is an open cup of plant fibres and cobwebs, sited in the fork of a tree.	Low	No	N/A	Low	Although this species has been recorded within 5 km of the subject land, it typically occupies grassy areas and requires abundant logs and fallen timber. Habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Petroica phoenicea</i> Flame Robin	Not Listed	Vulnerable	Ecosystem	Flame Robins are found in a broad coastal band from southern Queensland to just west of the South Australian border. The preferred habitat in summer includes moist eucalyptus forests and open woodlands, in winter prefers open woodlands and farmlands. It is considered migratory. Diet consists mainly of invertebrates.	Low	No	N/A	Low	Although this species has been recorded within 5 km of the subject land, it is considered a migratory species that typically breeds on ridges and slopes in areas dominated by native grasses. Habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Pluvialis squatarola</i> Grey Plover	Vulnerable	Vulnerable	N/A	Almost entirely coastal, but occasionally recorded on inland wetlands. Mainly on marine shores, inlets, estuaries and lagoons where there are nearby large tidal mudflats or sandflats for feeding and sandy beaches for roosting.	Low	No	N/A	Negligible	Although this species has been recorded within 5 km of the subject land, it is found in coastal environments or wetlands. Habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Pycnoptilus floccosus</i> Pilotbird	Vulnerable	Vulnerable	N/A	The pilotbird is found from the Wollemi National Park and Blue Mountains National Park in New South Wales through to the Dandenong Ranges, near Melbourne in Victoria. Its natural habitat is temperate wet sclerophyll forests and occasionally temperate rainforest, where there is dense undergrowth with abundant debris. [ALA 2022]	Low	No	N/A	Negligible	Although this species has been recorded within 5 km of the subject land, it is found from the Wollemi and Blue Mountains National Park. Habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Rostratula australis</i> Australian Painted Snipe	Endangered	Endangered	Ecosystem	Usually found in shallow inland wetlands including farm dams, lakes, rice crops, swamps and waterlogged grassland. They prefer freshwater wetlands, but have been recorded in brackish waters. Forages on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Stagonopleura guttata</i> Diamond Firetail	Vulnerable	Vulnerable	Ecosystem	The Diamond Firetail is widely distributed, found in a range of habitat types including open eucalypt forest, mallee and acacia scrubs. Often occur in vegetation along watercourses. Feeds exclusively on the	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features important for this species were

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				ground on ripe grass and herb seeds, green leaves and insects.					not recorded during field investigations. Potential for occurrence is low.
<i>Stictonetta naevosa</i> Freckled Duck	Not Listed	Vulnerable	Ecosystem	The Freckled Duck breeds in permanent fresh swamps that are heavily vegetated. Found in fresh or salty permanent open lakes, especially during drought. Often seen in groups on fallen trees and sand spits.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Tringa nebularia</i> Common Greenshank	Endangered	Endangered	N/A	Widely distributed throughout a range of inland wetlands and sheltered coastal habitats. Occurs in habitats with varying salinity.	Low	No	N/A	Negligible	This is a migratory species that occurs in coastal habitats and there are no records within 5 km of the subject land. Potential for occurrence is low.
<i>Tyto novaehollandiae</i> Masked Owl	Not Listed	Vulnerable	Species	The Masked Owl is found in range of wooded habitats that provide tall or dense mature trees with hollows suitable for nesting and roosting. It is mostly seen in open forests and woodlands adjacent to cleared lands. Prey includes hollow-dependent arboreal	Moderate	Yes	Yes	Low	Species was not recorded in the subject land during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				marsupials and terrestrial mammals.					
Mammals									
<i>Cercartetus nanus</i> Eastern Pygmy-possum	Not Listed	Vulnerable	Species	Patchily distributed from the coast to the Great Dividing Range, and as far as Pillaga, Dubbo, Parkes and Wagga Wagga on the western slopes. Inhabits rainforest through to sclerophyll forest and tree heath. Banksias and myrtaceous shrubs and trees are a favoured food source. Soft fruits are eaten when flowers are unavailable and it also feeds on insects. Will often nest in tree hollows, but can also construct its own nest. Because of its small size it is able to utilise a range of hollow sizes including very small hollows. Individuals will use a number of different hollows and an individual has been recorded using up to 9 nest sites within a 0.5 ha area over a 5 month period.	Moderate	Yes	Yes	Low	There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low. Not recorded during targeted survey.
<i>Chalinolobus dwyeri</i> Large-eared Pied Bat	Endangered	Vulnerable	Species	Occurs from the Queensland border to Ulladulla, with largest numbers from the sandstone escarpment country in the Sydney Basin and Hunter Valley. Primarily found in dry sclerophyll forests and	Low	No	N/A	Low	Although records of this species occur within 5 km of the subject land, suitable breeding habitat for this species was not

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				woodlands, but also found in rainforest fringes and subalpine woodlands. Forages on small, flying insects below the forest canopy. Roosts in colonies of between three and 80 in caves, Fairy Martin nests and mines, and beneath rock overhangs, but usually less than 10 individuals. Likely that it hibernates during the cooler months. The only known existing maternity roost is in a sandstone cave near Coonabarabran.					recorded during field investigations, nor is it considered present within 2kms of the site. Potential for occurrence is low.
<i>Dasyurus maculatus</i> Spotted-tailed Quoll	Endangered	Vulnerable	Ecosystem	Occurs along the east coast of Australia and the Great Dividing Range. Uses a range of habitats including sclerophyll forests and woodlands, coastal heathlands and rainforests. Occasional sightings have been made in open country, grazing lands, rocky outcrops and other treeless areas. Habitat requirements include suitable den sites, including hollow logs, rock crevices and caves, an abundance of food and an area of intact vegetation in which to forage. Seventy per cent of the diet is medium-sized mammals, and also feeds on invertebrates, reptiles and	Low	No	N/A	Negligible	Although there are records of this species within 5 km of the subject land, habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				birds. Individuals require large areas of relatively intact vegetation through which to forage. The home range of a female is between 180 and 1000 ha, while males have larger home ranges of between 2000 and 5000 ha. Breeding occurs from May to August.					
<i>Falsistrellus tasmaniensis</i> Eastern False Pipistrelle	Not Listed	Vulnerable	Ecosystem	Distribution extending east of the Great Dividing Range throughout the coastal regions of NSW, from the Queensland border to the Victorian border. Prefers wet high-altitude sclerophyll and coastal mallee habitat, preferring wet forests with a dense understorey but being found in open forests at lower altitudes. Apparently hibernates in winter. Roosts in tree hollows and sometimes in buildings in colonies of between 3 and 80 individuals. Often change roosts every night. Forages for beetles, bugs and moths below or near the canopy in forests with an open structure, or along trails. Has a large foraging range, up to 136 ha. Records show movements of up to 12 km between roosting and foraging sites.	Low	No	N/A	Low	Although there are multiple records of this species within 5 km of the subject land, habitat features important for this species were not recorded during field investigations. This species was recorded incidentally during targeted surveys for Southern Myotis, likely using the subject land as foraging habitat. As this species is an ecosystem credit species, further assessment is not required.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Isoodon obesulus obesulus</i> Southern Brown Bandicoot (eastern)	Endangered	Endangered	Species	This species prefers sandy soils with scrubby vegetation and/or areas with low ground cover that are burn from time to time. A mosaic of post fire vegetation is important for this species.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Micronomus norfolkensis</i> Eastern Coastal Free-tailed Bat	Not Listed	Vulnerable	Ecosystem	Distribution extends east of the Great Dividing Range from southern Queensland to south of Sydney. Most records are from dry eucalypt forests and woodland. Individuals tend to forage in natural and artificial openings in forests, although it has also been caught foraging low over a rocky river within rainforest and wet sclerophyll forest habitats. The species generally roosts in hollow spouts of large mature eucalypts (including paddock trees), although individuals have been recorded roosting in the roof of a hut, in wall cavities, and under metal caps of telegraph poles. Foraging generally occurs within a few kilometres of roosting sites.	Low	No	N/A	Low	Although there are multiple records of this species within 5 km of the subject land, habitat features important for this species were not recorded during field investigations. This species was recorded incidentally during targeted surveys for Southern Myotis, likely using the subject land as foraging habitat. As this species is an ecosystem credit species, further assessment is not

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
									required.
<i>Miniopterus australis</i> Little Bent-winged Bat	Not Listed	Vulnerable	Species/Ecosystem	Occurs from Northern Queensland to the Hawkesbury River near Sydney. Roost sites encompass a range of structures including caves, tunnels and stormwater drains. Young are raised by the females in large maternity colonies in caves in summer. Shows a preference for well timbered areas including rainforest, wet and dry sclerophyll forests, Melaleuca swamps and coastal forests. The Little Bentwing bat forages for small insects (such as moths, wasps and ants) beneath the canopy of densely vegetated habitats.	Low	No	N/A	Low	Although there are records of this species within 5 km of the subject land, no suitable breeding habitat (i.e. caves, mines or tunnels) is present within the subject land. Although no breeding habitat is present, this species was recorded incidentally during targeted surveys for Southern Myotis, likely using the subject land as foraging habitat. As this species is a species credit species for breeding habitat only, no further assessment is required.
<i>Miniopterus orianae oceanensis</i> Large Bent-winged Bat	Not Listed	Vulnerable	Species/Ecosystem	Occurs from Victoria to Queensland, on both sides of the Great Dividing Range. Forms large maternity roosts (up to 100,000 individuals) in caves and mines in spring and summer. Individuals may fly several hundred kilometres to their wintering sites, where they roost in caves, culverts,	Low	No	N/A	Low	Although there are records of this species within 5 km of the subject land, no suitable breeding habitat (i.e. caves, mines or tunnels) is present within the subject land. Although no breeding habitat is

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				buildings, and bridges. They occur in a broad range of habitats including rainforest, wet and dry sclerophyll forest, paperbark forest and open grasslands. Has a fast, direct flight and forages for flying insects (particularly moths) above the tree canopy and along waterways.					present, this species was recorded incidentally during targeted surveys for Southern Myotis, likely using the subject land as foraging habitat. As this species is a species credit species for breeding habitat only, no further assessment is required.
<i>Myotis macropus</i> Southern Myotis	Not Listed	Vulnerable	Species	Scattered, mainly coastal distribution extending to South Australia along the Murray River. Roosts in caves, mines or tunnels, under bridges, in buildings, tree hollows, and even in dense foliage. Colonies occur close to water bodies, ranging from rainforest streams to large lakes and reservoirs. They catch aquatic insects and small fish with their large hind claws, and also catch flying insects.	Moderate	Yes	Yes	High	This species was recorded in the subject land during targeted survey. Breeding and foraging habitat was considered to be present within the subject land due to the presence of hollow-bearing trees within 200 m of suitable waterways. Impacts to this species will be mitigated (where possible) and offset in accordance with the BAM.
<i>Notamacropus parma</i> Parma Wallaby	Vulnerable	Not Listed	Species	Occurs in wet and dry sclerophyll forest with a thick, shrubby understorey associated with grassy	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				patches. They may also occur in rainforest but prefer the wet sclerophyll forest (Strahan, 1995 134 /id). This species feed on grasses and herbs (Strahan, 1995 134 /id).					land, and habitat features important for this species were not recorded during field investigations. Potential for occurrence is low.
<i>Petauroides volans</i> Greater Glider	Endangered	Not Listed	Species	The distribution of the Greater Glider includes the ranges and coastal plain of eastern Australia, where it inhabits a variety of eucalypt forests and woodlands. Presence and density of Greater Gliders is related to soil fertility, eucalypt tree species, disturbance history and density of suitable tree hollows. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe.	Moderate	Yes	Yes	Low	Species was not recorded in the subject land during targeted surveys.
<i>Petaurus australis</i> Yellow-bellied Glider	Vulnerable	Vulnerable	Ecosystem	Restricted to tall native forests in regions of high rainfall along the coast of NSW. Preferred habitats are productive, tall open sclerophyll forests where mature trees provide shelter and nesting hollows. Critical elements of habitat include sap-site trees, winter flowering eucalypts, mature trees suitable for den sites and a mosaic of different forest types.	Low	No	N/A	Low	Limited suitable habitat present within the subject land and surrounds.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Petaurus norfolcensis</i> Squirrel Glider	Not Listed	Vulnerable	Species	Generally occurs in dry sclerophyll forests and woodlands but is absent from dense coastal ranges in the southern part of its range. Requires abundant hollow-bearing trees and a mix of eucalypts, banksias and acacias. Within a suitable vegetation community at least one species should flower heavily in winter and one species of eucalypt should be smooth barked.	Moderate	Yes	Yes	Low	Limited suitable habitat present within the subject land and surrounds. Not recorded during targeted survey.
<i>Phascolarctos cinereus</i> Koala	Endangered	Endangered	Species	In NSW the Koala mainly occurs on the central and north coasts with some populations in the western region. Koalas feed almost exclusively on eucalypt foliage, and their preferences vary regionally. Primary feed trees include <i>Eucalyptus robusta</i> , <i>E. tereticornis</i> , <i>E. punctata</i> , <i>E. haemostoma</i> and <i>E. signata</i> . They are solitary with varying home ranges.	Moderate	Yes	Yes	Low	This species has been recorded within 5 km of the subject land. Feed trees were also recorded within the subject land during field investigations, including Forest Red Gum, which is a high preferred use tree for the Central Coast Koala Management Area. However, it was not recorded in the subject land during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
<i>Pseudomys novaehollandiae</i> New Holland Mouse	Vulnerable	Vulnerable	Ecosystem	The New Holland Mouse currently has a disjunct, fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Across the species' range the New Holland Mouse is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes. The home range of the New Holland Mouse can range from 0.44 ha to 1.4 ha. The New Holland Mouse is a social animal, living predominantly in burrows shared with other individuals. The species is nocturnal and omnivorous, feeding on seeds, insects, leaves, flowers and fungi, and is therefore likely to play an important role in seed dispersal and fungal spore dispersal. It is likely that the species spends considerable time foraging above-ground for food, predisposing it to predation by native predators and introduced species. Breeding typically occurs between August and January, but can extend into autumn.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land, and habitat features important for this species, including heath vegetation, were not recorded during field investigations. Potential for occurrence is low.
<i>Pteropus poliocephalus</i>	Vulnerable	Vulnerable	Species/Ecosystem	Occurs along the NSW coast, extending further inland in the	Moderate	No	N/A	Low	

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
Grey-headed Flying-fox				north. This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Roosts in large colonies, commonly in dense riparian vegetation.					Although there are over 250 records of this species within 5 km of the subject land, no breeding camps were recorded during field investigations and there are no breeding camps within proximity the subject land. While the species may infrequently use the site for opportunistic foraging, the potential for impact is low due to the absence of breeding camps.
<i>Saccolaimus flaviventris</i> Yellow-bellied Sheath-tail-bat	Not Listed	Vulnerable	Ecosystem	Found throughout NSW in habitats including wet and dry sclerophyll forest, open woodland, acacia shrubland, mallee, grasslands and desert. They roost in tree hollows in colonies and have also been observed roosting in animal burrows, abandoned Sugar Glider nests, cracks in dry clay, hanging from buildings and under slabs of rock. Forages for insects above the canopy in forests.	Low	No	N/A	Low	Although there are multiple records of this species within 5 km of the subject land and tree hollows were recorded on site, other habitat features important for this species were largely absent. Potential for occurrence is low.
<i>Scoteanax rueppellii</i>	Not Listed	Vulnerable	Ecosystem	Occurs along the Great Dividing Range and in coastal	Low	No	N/A	Low	Although there are

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
Greater Broad-nosed Bat				areas. Occurs in woodland and rainforest, preferring open habitats or openings in wetter forests. Often hunts along creeks or river corridors. Preys upon beetles and other large, flying insects, other bats and spiders. Roosts in hollow tree trunks and branches.					multiple records of this species within 5 km of the subject land and tree hollows were recorded on site, other habitat features important for this species were largely absent. This species was recorded incidentally during targeted surveys for Southern Myotis, likely using the subject land as foraging habitat. As this species is an ecosystem credit species, further assessment is not required.
Amphibians									
<i>Heleioporus australiacus</i> Giant Burrowing Frog	Endangered	Vulnerable	Species	Prefers hanging swamps on sandstone shelves adjacent to perennial non-flooding creeks. Can also occur within shale outcrops within sandstone formations. Known from wet and dry forests and montane woodland in the southern part range. Individuals can be	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land, and habitat features important for this species were largely absent. Potential for occurrence is low.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/ undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				found around sandy creek banks or foraging along ridge-tops during or directly after heavy rain. Males often call from burrows located in sandy banks next to water. Spends the majority of its time in non-breeding habitat 20-250m from breeding sites.					
<i>Litoria aurea</i> Green and Golden Bell Frog	Vulnerable	Endangered	Species	Most existing locations for the species occur as small, coastal, or near coastal populations, with records occurring between south of Grafton and northern VIC. The species is found in marshes, dams and stream sides, particularly those containing bullrushes or spikerushes. Preferred habitat contains water bodies that are unshaded, are free of predatory fish, have a grassy area nearby and have diurnal sheltering sites nearby such as vegetation or rocks , although the species has also been recorded from highly disturbed areas including disused industrial sites, brick pits, landfill areas and cleared land. Breeding usually occurs in summer. Tadpoles, which take approximately 10-12 weeks to develop , feed on algae and other vegetative	Moderate	Yes	Yes	Low	Although there is one record of this species within 500 m of the subject land and potential breeding habitat was present within the subject land, the watercourse and associated riparian habitat was considered partially degraded. This species was not recorded during targeted surveys.

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				matter. Adults eat insects as well as other frogs, including juveniles of their own species.					
<i>Mixophyes balbus</i> Stuttering Frog	Vulnerable	Endangered	Species	This species is usually associated with mountain streams, wet mountain forests and rainforests. It rarely moves very far from the banks of permanent forest streams, although it will forage on nearby forest floors. Eggs are deposited in leaf litter on the banks of streams and are washed into the water during heavy rains.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land, and habitat features important for this species, such as rainforest vegetation, were not recorded during the field investigations. The watercourse that intersects the subject land was also recorded in a partially degraded condition and is unlikely to provide suitable breeding habitat for the species. Potential for occurrence is low.
Reptiles									
<i>Delma impar</i> Striped Legless Lizard	Vulnerable	Vulnerable	Species	Generally occurs in lowland native grasslands occurring on gently undulating plains having soils of basaltic origin. Grasses are dominated by perennial, tussock-forming grasses such as <i>Themeda triandra</i> ,	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land, and habitat features important for this species, such as high

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
				Austrostipa spp. and Austrodanthonia spp. Inhabits secondary grasslands only when they occur within 2km of primary grassland.					cover of native grass species, were not recorded during the field investigations. Potential for occurrence is low.
<i>Hoplocephalus bungaroides</i> Broad-headed Snake	Endangered	Endangered	Species/Ecosystem	Mainly occurs in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within these habitats they generally use rock crevices and exfoliating rock during the cooler months and tree hollows during summer.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land, and habitat features important for this species were not recorded during the field investigations. Potential for occurrence is low.
<i>Varanus rosenbergi</i> Rosenberg's Goanna	Not Listed	Vulnerable	Ecosystem	This species is a Hawkesbury/Narrabeen sandstone outcrop specialist. Occurs in coastal heaths, humid woodlands and both wet and dry sclerophyll forests. Termite mounds are a critical habitat component.	Low	No	N/A	Negligible	There are no records of this species within 5 km of the subject land, and habitat features important for this species were not recorded during the field investigations. Potential for occurrence is low.
Fish									
<i>Macquaria australasica</i>	Endangered	Not Listed	N/A	Macquarie Perch are found in the Murray-Darling Basin	Low	No	N/A	Negligible	The subject land does

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
Macquarie perch				(particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven catchments. Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their tributaries					not occur within the Murray-Darling Basin, and there are no records of this species within 5 km. Potential for occurrence is low.
<i>Prototroctes maraena</i> Australian Grayling	Vulnerable	Not Listed	N/A	The Australian Grayling occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range from Sydney southwards to the Otway Ranges in Victoria, and Tasmania. Australian grayling do not occur in the inland Murray-Darling Basin system. Grayling is a diadromous species; migrating between freshwater streams and the ocean. This species has been found in clear, gravel-bottomed streams with alternating pools and riffles, and granite outcrops, and also in muddy-bottomed, heavily silted habitats.	Low	No	N/A	Negligible	This is a migratory fish that travels from the sea to freshwater rivers and streams using estuaries. Given that much of the watercourse within and adjacent to the subject land is degraded, it is unlikely that this species would utilise the area as habitat. There are no records of this species within 5 km of the subject land. Potential for occurrence is low.
Gastropods									
<i>Meridolum corneovirens</i>	Not Listed	Endangered	Species	Most likely restricted to Cumberland Plain, Castlereagh	Moderate	Yes	Yes	Low	This species is

Species	Status		BAM predicted SCS	Habitat Description	Potential occurrence in subject land	BAM Candidate species	Survey required/undertaken	Potential for impact	Conclusion and rationale
	EPBC	BC							
Cumberland Plain Land Snail				Woodlands and boundaries between River-flat Forest and Cumberland Plain Woodland. It is normally found beneath logs, debris and amongst accumulated leaf and bark particularly at the base of trees. May also use soil cracks for refuge.					associated with the vegetation communities recorded in the subject land and there are several records within 5 km. However, it was not recorded during targeted surveys.
<i>Pommerhelix duralensis</i> Dural Woodland Snail	Endangered	Endangered	Species	The species is a shale-influenced-habitat specialist, which occurs in low densities along the western and northwest fringes of the Cumberland IBRA subregion on shale-sandstone transitional landscapes. The species has a strong affinity for communities in the interface region between shale-derived and sandstone-derived soils, with forested habitats that have good native cover and woody debris. It favours sheltering under rocks or inside curled-up bark. It does not burrow nor climb. The species has also been observed resting in exposed areas, such as on exposed rock or leaf litter, however it will also shelter beneath leaves, rocks and light woody debris.	Low	No	N/A	Negligible	Although there are records of this species within 5 km of the subject land, habitat features important for this species were largely absent from the subject land. Potential for occurrence is low.

Appendix 3 Flora

Appendix 3.1 BAM plot field data

Table A 3 BAM plot floristics

Family	Scientific name	Common name	40523. B01		40523. B02		40523. B03		40523. B04		40523. B05		40523. B06		40523. B07		40523. B08		40523. B09		
			Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	
Native species																					
Apiaceae	Centella asiatica	Indian Pennywort	0.1	20	0.7	200	2	200	0.5	50					0.3	100	0.5	500	0.5	200	
Asphodelaceae	Dianella caerulea	Blue Flax-lily	0.2	10			0.1	10			0.3	20	0.1	5							
Asphodelaceae	Dianella revoluta var. revoluta	None																	0.1	3	
Asteraceae	Ozothamnus diosmifolius	White Dogwood													0.1	5					
Campanulaceae	Lobelia purpurascens	whiteroot	0.1	5	0.1	10	0.1	10							0.4	100					
Casuarinaceae	Casuarina glauca	Swamp Oak					25	50	1	20	0.5	1	3	5	0.2	8					
Chenopodiaceae	Einadia hastata	Berry Saltbush																			
Chenopodiaceae	Einadia nutans	Climbing Saltbush	0.1	4											0.1	10					
Chenopodiaceae	Einadia trigonos	Fishweed													0.1	1					
Clusiaceae	Hypericum gramineum	Small St John's Wort			0.1	10	0.1	10							0.1	9	0.1	50	2	100	
Commelinaceae	Commelina cyanea	Native Wandering Jew					0.2	20			0.1	10									
Convolvulaceae	Dichondra repens	Kidney Weed	7	1000	7	600					0.5	100	0.3	30	0.1	10	0.1	50	5	500	
Cyperaceae	Carex inversa	Knob Sedge																			
Cyperaceae	Cyperus gracilis	Slender Flat-sedge	0.1	5	0.1	10							0.1	2							
Dennstaedtiaceae	Hypolepis muelleri	Harsh Ground Fern							2	30											
Fabaceae (Caesalpinoideae)	Senna spp.	None					0.1	1													
Fabaceae (Faboideae)	Indigofera australis	Australian Indigo											0.5	1							
Fabaceae (Faboideae)	Grona varians	None					0.1	10													
Fabaceae (Faboideae)	Glycine clandestina	Twining glycine	0.3	50	0.1	10	0.1	10													
Fabaceae (Faboideae)	Glycine tabacina	Variable Glycine	15		0.4	40									0.2	400	0.1	10	0.1	10	
Fabaceae (Mimosoideae)	Acacia parramattensis	Parramatta Wattle									7	20	2	4	20	40					
Goodeniaceae	Goodenia ovata	Hop Goodenia									0.1	10									
Goodeniaceae	Goodenia hederacea	Ivy Goodenia													0.1	10					

Table A 3 BAM plot floristics

Family	Scientific name	Common name	40523. B10		40523. B11	
			Cvr%	Abund.	Cvr%	Abund.
Native species						
Apiaceae	Centella asiatica	Indian Pennywort	0.1	50	0.1	10
Asphodelaceae	Dianella caerulea	Blue Flax-lily			0.1	4
Asphodelaceae	Dianella revoluta var. revoluta	None				
Asteraceae	Ozothamnus diosmifolius	White Dogwood				
Campanulaceae	Lobelia purpurascens	whiteroot	0.1	10	0.1	20
Casuarinaceae	Casuarina glauca	Swamp Oak	45	400	0.2	5
Chenopodiaceae	Einadia hastata	Berry Saltbush	0.1	1		
Chenopodiaceae	Einadia nutans	Climbing Saltbush	0.1	10	0.1	10
Chenopodiaceae	Einadia trigonos	Fishweed				
Clusiaceae	Hypericum gramineum	Small St John's Wort				
Commelinaceae	Commelina cyanea	Native Wandering Jew	0.1	10	0.1	5
Convolvulaceae	Dichondra repens	Kidney Weed	0.3	100	1	400
Cyperaceae	Carex inversa	Knob Sedge			0.1	10
Cyperaceae	Cyperus gracilis	Slender Flat-sedge			0.1	10
Dennstaedtiaceae	Hypolepis muelleri	Harsh Ground Fern				
Fabaceae (Caesalpinioideae)	Senna spp.	None				
Fabaceae (Faboideae)	Indigofera australis	Australian Indigo				
Fabaceae (Faboideae)	Grona varians	None				
Fabaceae (Faboideae)	Glycine clandestina	Twining glycine	0.1	5	0.1	10
Fabaceae (Faboideae)	Glycine tabacina	Variable Glycine	0.1	20		
Fabaceae (Mimosoideae)	Acacia parramattensis	Parramatta Wattle			3	30
Goodeniaceae	Goodenia ovata	Hop Goodenia				
Goodeniaceae	Goodenia hederacea	Ivy Goodenia				

Table A 3 BAM plot floristics

Family	Scientific name	Common name	40523. B01		40523. B02		40523. B03		40523. B04		40523. B05		40523. B06		40523. B07		40523. B08		40523. B09	
			Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.
Juncaceae	Juncus usitatus	None	0.1	5			0.1	5	0.2	10					0.2	20				
Lamiaceae	Plectranthus parviflorus	None					0.1	5							0.1	2				
Lomandraceae	Lomandra longifolia	Spiny-headed Mat-rush	0.5	10					0.1		3	10	5	20	1	20				
Myrtaceae	Eucalyptus amplifolia	Cabbage Gum					20	10							10	4				
Myrtaceae	Eucalyptus tereticornis	Forest Red Gum									1	2								
Myrtaceae	Eucalyptus moluccana	Grey Box			20	10					0.5	2	2	2						
Myrtaceae	Eucalyptus crebra	Narrow-leaved Ironbark	25	20																
Myrtaceae	Melaleuca decora	None									2	3	3	4						
Myrtaceae	Angophora floribunda	Rough-barked Apple	1	2					1	1										
Myrtaceae	Corymbia maculata	Spotted Gum													10	2				
Oxalidaceae	Oxalis perennans	None			0.1	10							0.1	50			0.1	10	0.2	20
Oxalidaceae	Oxalis spp.	None					0.1	10												
Pittosporaceae	Bursaria spinosa	Native Blackthorn	0.3	6			0.1	1			0.1	1			0.3	10				
Plantaginaceae	Veronica plebeia	Trailing Speedwell											0.1	5						
Poaceae	Imperata cylindrica	Blady Grass													0.5	50				
Poaceae	Entolasia marginata	Bordered Panic			0.1	5									0.1	10			0.1	5
Poaceae	Cynodon dactylon	Common Couch	0.5	20									3	300			55	5000	0.2	50
Poaceae	Oplismenus hirtellus	None	0.2	20			0.3	20											5	400
Poaceae	Themeda triandra	None	0.1	5																
Poaceae	Microlaena stipoides	Weeping Grass	75	6000	2	80	55	5000							25	2000	0.5	50	35	3000
Poaceae	Entolasia stricta	Wiry Panic					0.3	20									0.1	20		
Polygonaceae	Persicaria decipiens	Slender Knotweed							0.2	5										
Polygonaceae	Rumex brownii	Swamp Dock							0.1	1										
Proteaceae	Hakea salicifolia	Willow-leaved Hakea																	6	20
Sapindaceae	Cupaniopsis anacardioides	Tuckeroo					0.1	5							0.1	1				
Solanaceae	Solanum prinophyllum	Forest Nightshade	0.1	10			0.1	5												
Typhaceae	Typha orientalis	Broad-leaved Cumbungi							15	100										
Introduced species																				
Polygonaceae	Acetosella vulgaris	Sheep Sorrel															0.1	20		

Table A 3 BAM plot floristics

Family	Scientific name	Common name	40523. B10		40523. B11	
			Cvr%	Abund.	Cvr%	Abund.
Juncaceae	Juncus usitatus	None	0.3	20	0.1	10
Lamiaceae	Plectranthus parviflorus	None				
Lomandraceae	Lomandra longifolia	Spiny-headed Mat-rush				
Myrtaceae	Eucalyptus amplifolia	Cabbage Gum			15	8
Myrtaceae	Eucalyptus tereticornis	Forest Red Gum				
Myrtaceae	Eucalyptus moluccana	Grey Box	2	1		
Myrtaceae	Eucalyptus crebra	Narrow-leaved Ironbark				
Myrtaceae	Melaleuca decora	None				
Myrtaceae	Angophora floribunda	Rough-barked Apple			20	20
Myrtaceae	Corymbia maculata	Spotted Gum				
Oxalidaceae	Oxalis perennans	None	0.1	10	0.1	20
Oxalidaceae	Oxalis spp.	None				
Pittosporaceae	Bursaria spinosa	Native Blackthorn			10	100
Plantaginaceae	Veronica plebeia	Trailing Speedwell				
Poaceae	Imperata cylindrica	Blady Grass				
Poaceae	Entolasia marginata	Bordered Panic				
Poaceae	Cynodon dactylon	Common Couch				
Poaceae	Oplismenus hirtellus	None	0.5	80	1	300
Poaceae	Themeda triandra	None			0.5	20
Poaceae	Microlaena stipoides	Weeping Grass	30	2000	80	6000
Poaceae	Entolasia stricta	Wiry Panic				
Polygonaceae	Persicaria decipiens	Slender Knotweed				
Polygonaceae	Rumex brownii	Swamp Dock	0.1	5		
Proteaceae	Hakea salicifolia	Willow-leaved Hakea				
Sapindaceae	Cupaniopsis anacardioides	Tuckeroo			0.1	1
Solanaceae	Solanum prinophyllum	Forest Nightshade	0.3	30	0.5	100
Typhaceae	Typha orientalis	Broad-leaved Cumbungi				
Introduced species						
Polygonaceae	Acetosella vulgaris	Sheep Sorrel				

Table A 3 BAM plot floristics

Family	Scientific name	Common name	40523. B01		40523. B02		40523. B03		40523. B04		40523. B05		40523. B06		40523. B07		40523. B08		40523. B09	
			Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.
Apocynaceae	Araujia sericifera	Moth Vine	0.2	10			0.3	20							0.2	20			0.5	3
Asparagaceae	Asparagus aethiopicus	Asparagus Fern							0.1	10										
Asparagaceae	Asparagus asparagoides	Bridal Creeper	0.3	20	0.1	5	0.1	10			0.1	5			0.1	10			0.5	50
Asteraceae	Bidens pilosa	Cobbler's Pegs	0.1	10	0.1	5	0.1	10			0.1	20			0.3	30				
Cannaceae	Canna spp.	None																		
Brassicaceae	Cardamine hirsuta	Common Bittercress											0.2	30			0.1	20		
Poaceae	Cenchrus clandestinus	Kikuyu Grass			55	3000			0.1	10	35	3000	70	6000	35	3000	5	200		
Gentianaceae	Centaurium erythraea	Common Centaury							0.1	1			0.1	10						
Caryophyllaceae	Cerastium glomeratum	Mouse-ear Chickweed															0.1	10		
Poaceae	Chloris gayana	Rhodes Grass																		
Asteraceae	Cirsium vulgare	Spear Thistle	0.1	5			0.1	10			0.1	20	0.1	10	0.1	10	0.1	20		
Asteraceae	Conyza bonariensis	Flaxleaf Fleabane									0.1	20	0.1	10	0.1	1	0.1	5	0.1	10
Asteraceae	Crassocephalum crepidioides	Thickhead									0.1	10								
Apiaceae	Cyclospermum leptophyllum	Slender Celery																	0.1	2
Cyperaceae	Cyperus eragrostis	Umbrella Sedge					0.1	1					0.1	5						
Cyperaceae	Cyperus rotundus	Nutgrass																	0.1	5
Poaceae	Ehrharta erecta	Panic Veldtgrass	0.2	20											0.1	20				
Poaceae	Ehrharta longiflora	Annual Veldtgrass					0.1	20												
Fabaceae (Faboideae)	Erythrina crista-galli	Cockspur Coral Tree							0.3	1										
Euphorbiaceae	Euphorbia depauperata var. pubescens	None							0.1	10										
Oleaceae	Fraxinus spp.	None																		
Rubiaceae	Galium aparine	Goosegrass	0.1	5			0.1	10												
Asteraceae	Hypochaeris glabra	Smooth Catsear			3	100					0.3	30								
Juncaceae	Juncus acutus subsp. acutus	Sharp Rush							0.1	1										
Oleaceae	Ligustrum sinense	Small-leaved Privet													2	50			0.5	1

Table A 3 BAM plot floristics

Family	Scientific name	Common name	40523. B10		40523. B11	
			Cvr%	Abund.	Cvr%	Abund.
Apocynaceae	Araujia sericifera	Moth Vine	0.3	30	0.1	10
Asparagaceae	Asparagus aethiopicus	Asparagus Fern				
Asparagaceae	Asparagus asparagoides	Bridal Creeper	0.2	30	0.3	50
Asteraceae	Bidens pilosa	Cobbler's Pegs	0.1	20		
Cannaceae	Canna spp.	None			0.1	1
Brassicaceae	Cardamine hirsuta	Common Bittercress				
Poaceae	Cenchrus clandestinus	Kikuyu Grass				
Gentianaceae	Centaurium erythraea	Common Centaury				
Caryophyllaceae	Cerastium glomeratum	Mouse-ear Chickweed				
Poaceae	Chloris gayana	Rhodes Grass	0.1	10		
Asteraceae	Cirsium vulgare	Spear Thistle	0.1	10	0.1	1
Asteraceae	Conyza bonariensis	Flaxleaf Fleabane	0.1	2	0.1	5
Asteraceae	Crassocephalum crepidioides	Thickhead				
Apiaceae	Cyclospermum leptophyllum	Slender Celery				
Cyperaceae	Cyperus eragrostis	Umbrella Sedge				
Cyperaceae	Cyperus rotundus	Nutgrass				
Poaceae	Ehrharta erecta	Panic Veldtgrass	35	3000	0.1	10
Poaceae	Ehrharta longiflora	Annual Veldtgrass				
Fabaceae (Faboideae)	Erythrina crista-galli	Cockspur Coral Tree				
Euphorbiaceae	Euphorbia depauperata var. pubescens	None			0.1	10
Oleaceae	Fraxinus spp.	None			0.1	1
Rubiaceae	Galium aparine	Goosegrass	0.1	30		
Asteraceae	Hypochaeris glabra	Smooth Catsear				
Juncaceae	Juncus acutus subsp. acutus	Sharp Rush				
Oleaceae	Ligustrum sinense	Small-leaved Privet			0.1	10

Table A 3 BAM plot floristics

Family	Scientific name	Common name	40523. B01		40523. B02		40523. B03		40523. B04		40523. B05		40523. B06		40523. B07		40523. B08		40523. B09	
			Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.
Fabaceae (Faboideae)	Lotus subbiflorus	Hairy Birds-foot Trefoil			0.5	70													0.1	3
Poaceae	Megathyrsus maximus	None	0.1	5																
Malvaceae	Modiola caroliniana	Red-flowered Mallow			0.3	40					0.1	5	4	200			0.1	5		
Araceae	Monstera deliciosa	Fruit Salad Plant																		
Moraceae	Morus alba	White Mulberry																		
Ochnaceae	Ochna serrulata	Mickey Mouse Plant													0.1	1				
Asteraceae	Onopordum acanthium subsp. acanthium	Scotch Thistle																	0.2	10
Cactaceae	Opuntia stricta	Common Prickly Pear	0.1	2											0.1	1				
Poaceae	Paspalum dilatatum	Paspalum	0.3	20	0.1	10	0.3	30					2	200	0.1	10	25	2000	25	2000
Poaceae	Paspalum urvillei	Vasey Grass	0.1	5							0.1	5								
Passifloraceae	Passiflora suberosa	Cork Passionfruit					0.1	5							0.3	30				
Pinaceae	Pinus radiata	Radiata Pine																	35	20
Plantaginaceae	Plantago lanceolata	Lamb's Tongues	0.1	1	4	500	0.3	30			0.2	20	2	200	0.5	60	5	500	2	100
Poaceae	Poa annua	Winter Grass											0.2	90			0.1	30		
Iridaceae	Romulea rosea var. australis	Onion Grass															1	100		
Rosaceae	Rubus fruticosus sp. agg.	Blackberry complex																	0.2	5
Polygonaceae	Rumex crispus	Curled Dock							0.1	10	0.1	7	0.1	5						
Asteraceae	Senecio madagascariensis	Fireweed	0.1	3	0.5	50					0.1	10			0.1	5	0.1	10	0.2	30
Poaceae	Setaria palmifolia	Palm Grass																		
Poaceae	Setaria parviflora	None	0.3	50			0.1	10												
Malvaceae	Sida rhombifolia	Paddy's Lucerne	3	100	0.1	10	0.1	10							0.2	30			0.2	50
Solanaceae	Solanum nigrum	Black-berry Nightshade							0.1	10	0.1	10								
Solanaceae	Solanum pseudocapsicum	Madeira Winter Cherry	0.5	50			0.1	10											0.1	1
Solanaceae	Solanum seaforthianum	Climbing Nightshade																		
Solanaceae	Solanum sisymbriifolium	None									0.1	1			0.1	10				
Asteraceae	Soliva sessilis	Bindyi											0.2	100	0.1	10				

Table A 3 BAM plot floristics

Family	Scientific name	Common name	40523. B10		40523. B11	
			Cvr%	Abund.	Cvr%	Abund.
Fabaceae (Faboideae)	Lotus subbiflorus	Hairy Birds-foot Trefoil				
Poaceae	Megathyrsus maximus	None				
Malvaceae	Modiola caroliniana	Red-flowered Mallow				
Araceae	Monstera deliciosa	Fruit Salad Plant			0.1	1
Moraceae	Morus alba	White Mulberry	0.3	1		
Ochnaceae	Ochna serrulata	Mickey Mouse Plant	0.1	1		
Asteraceae	Onopordum acanthium subsp. acanthium	Scotch Thistle				
Cactaceae	Opuntia stricta	Common Prickly Pear	0.1	1	0.1	1
Poaceae	Paspalum dilatatum	Paspalum				
Poaceae	Paspalum urvillei	Vasey Grass				
Passifloraceae	Passiflora suberosa	Cork Passionfruit	0.3	30	0.1	10
Pinaceae	Pinus radiata	Radiata Pine				
Plantaginaceae	Plantago lanceolata	Lamb's Tongues	0.1	10		
Poaceae	Poa annua	Winter Grass				
Iridaceae	Romulea rosea var. australis	Onion Grass				
Rosaceae	Rubus fruticosus sp. agg.	Blackberry complex				
Polygonaceae	Rumex crispus	Curled Dock	0.1	5		
Asteraceae	Senecio madagascariensis	Fireweed				
Poaceae	Setaria palmifolia	Palm Grass	0.1	1	0.1	1
Poaceae	Setaria parviflora	None				
Malvaceae	Sida rhombifolia	Paddy's Lucerne	0.1	10	0.1	1
Solanaceae	Solanum nigrum	Black-berry Nightshade	0.1	2		
Solanaceae	Solanum pseudocapsicum	Madeira Winter Cherry	0.5	50	0.1	10
Solanaceae	Solanum seaforthianum	Climbing Nightshade	0.1	2		
Solanaceae	Solanum sisymbriifolium	None				
Asteraceae	Soliva sessilis	Bindyi				

Table A 3 BAM plot floristics

Family	Scientific name	Common name	40523. B01		40523. B02		40523. B03		40523. B04		40523. B05		40523. B06		40523. B07		40523. B08		40523. B09	
			Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.	Cvr%	Abund.
Asteraceae	Sonchus oleraceus	Common Sowthistle	0.1	10			0.1	10			0.1	5	0.1	10	0.1	10				
Poaceae	Stenotaphrum secundatum	Buffalo Grass											0.3	20						
Asteraceae	Taraxacum officinale	Dandelion	0.1	1	0.1	10					0.1	1	0.1	5	0.1	20	0.1	20	0.5	50
Commelinaceae	Tradescantia fluminensis	Wandering Jew					5	100	0.5	50										
Fabaceae (Faboideae)	Trifolium repens	White Clover			3	400					0.5	20	3	300			0.2	20	0.2	50
Verbenaceae	Verbena bonariensis	Purpletop	0.1	10					0.1	10	0.1	20			0.1	5				
Verbenaceae	Verbena rigida var. rigida	Veined Verbena			0.1	10							0.1	5						
Fabaceae (Faboideae)	Vicia sativa	Common vetch															0.1	10		

Table A 3 BAM plot floristics

Family	Scientific name	Common name	40523. B10		40523. B11	
			Cvr%	Abund.	Cvr%	Abund.
Asteraceae	Sonchus oleraceus	Common Sowthistle	0.1	10		
Poaceae	Stenotaphrum secundatum	Buffalo Grass				
Asteraceae	Taraxacum officinale	Dandelion	0.1	10		
Commelinaceae	Tradescantia fluminensis	Wandering Jew	15	500		
Fabaceae (Faboideae)	Trifolium repens	White Clover				
Verbenaceae	Verbena bonariensis	Purpletop				
Verbenaceae	Verbena rigida var. rigida	Veined Verbena				
Fabaceae (Faboideae)	Vicia sativa	Common vetch				

Table A 4 BAM plot summary

plot	pct	area	patchsize	conditionclass	zone	easting	northing	bearing	compTree	compShrub	compGrasses	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrasses
40523.B01	3320	1.95	100	Moderate	56	308976	6267268	330	2	1	7	6	0	2	26.0	0.3	76.5
40523.B02	3320	0.27	100	Low	56	308867	6267432	330	1	0	3	5	0	2	20.0	0.0	2.2
40523.B03	4025	0.89	100	Moderate	56	308931	6267535	135	3	2	4	8	0	2	45.1	0.2	55.7
40523.B04	3975	0.04	100	Moderate	56	309057	6267202	315	2	0	3	3	1	0	2.0	0.0	15.3
40523.B05	3320	1.85	100	Landscape pl	56	308820	6267292	140	4	3	1	3	0	0	9.0	2.2	3.0
40523.B06	3320	1.85	100	Landscape pl	56	308916	6267191	150	3	2	3	4	0	0	7.0	3.5	8.1
40523.B07	4025	0.51	100	Revegetated	56	308799	6267934	108	5	2	5	8	0	1	40.3	0.4	26.8
40523.B08	Exotic g'cover	1.59			56	308886	6267371	55	0	0	3	4	0	1	0.0	0.0	55.6
40523.B09	Exotic veg	0.17			56	308922	6267421	211	0	1	4	5	0	1	0.0	6.0	40.3
40523.B10	4025	0.89	100	Moderate	56	308992	6267454	4	2	0	3	9	0	2	47.0	0.0	30.8
40523.B11	3320	1.95	100	Moderate	56	309014	6267206	330	5	1	6	8	0	1	38.3	10.0	81.8

Table A 4 BAM plot summary

plot	pct	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowtrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to1	funTreeStem20to2	funTreeStem30to4	funTreeStem50to7	funTreeRegen	funHighThroughputExotic
40523.B01	3320	7.6	0.0	15.3	4	1	22.4	5.0	1	1	1	1	1	1	1.4
40523.B02	3320	8.0	0.0	0.5	2	1	7.6	4.5	1	1	1	1	1	0	55.8
40523.B03	4025	2.8	0.0	0.2	2	2	38.4	6.0	1	1	1	1	1	1	6.0
40523.B04	3975	0.8	2.0	0.0	1	1	0.0	0.0	1	1	0	0	1	1	1.1
40523.B05	3320	0.9	0.0	0.0	0	0	12.0	0.0	1	1	1	0	0	1	35.4
40523.B06	3320	0.6	0.0	0.0	0	0	2.6	5.0	1	1	0	1	0	1	72.4
40523.B07	4025	1.3	0.0	0.2	0	0	39.6	50.0	1	1	1	1	0	1	38.3
40523.B08	Exotic g'cover	0.8	0.0	0.1	0	0	2.0	4.0	0	0	0	0	0	0	31.2
40523.B09	Exotic veg	7.8	0.0	0.1	0	0	9.0	10.0	1	1	1	7	0	0	61.9
40523.B10	4025	1.3	0.0	0.2	1	1	18.0	15.0	1	1	1	1	1	1	51.2
40523.B11	3320	2.1	0.0	0.1	3	2	24.0	17.0	1	1	1	1	1	1	0.7

Appendix 3.2 BAM plot data sheets

BAM Plot Data Sheet				Site Sheet no:1 of 2			
		Survey Name		Veg Zone ID	Recorders		
Date	16/07/2025	Kellyville SP Staging		Moderate	NZ		
Zone 56	Datum GDA94	Plot ID	40523.B11	Plot dimensions	50x20	Orientation of middle	330
Easting 309015	Northing 6267207	IBRA region	Sydney Basin	Photo #			
Plant Community Type		3320			EEC: Yes	Confidence H	

BAM Attribute (400m2 plot)		Sum values		BAM Attribute (1000m2 plot)	
Count of Native Richness	Trees	5		DBH	# Tree Stems Count
	Shrubs	1		80+ cm	1
	Grasses etc.	6		50 - 79 cm	2
	Forbs	8		30 - 49 cm	1
	Ferns	0		20 - 29cm	1
	Other	1		10 - 19 cm	1
Sum of Cover of native vascular plants by growth form group	Trees	38.3		5 - 9 cm	1
	Shrubs	10		< 5 cm	1
	Grasses etc.	81.8		Length of logs (m)	17
	Forbs	2.1		No. trees with hollows	2
	Ferns	0			
	Other	0.1			
High Threat Weed cover		0.7			

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	10	20	25	30	35
Average of the 5 subplots	24				

Notes	
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Flate	Soil Surface Texture	Sandy clay
Soil Colour	Dark reddish brown	Site Drainage	Good	Distance to nearest water	40 m

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			
Storm damage			

Weediness			
Other			

400 m2 plot:Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	16/07/2025	Kellyville SP Staging	40523.B11	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
TG	Acacia parramattensis	N	3	30	
TG	Angophora floribunda	N	20	20	
	Araujia sericifera	HTE	0.1	10	
	Asparagus asparagoides	HTE	0.3	50	
SG	Bursaria spinosa	N	10	100	
	Canna spp.	E	0.1	1	
GG	Carex inversa	N	0.1	10	
TG	Casuarina glauca	N	0.2	5	
FG	Centella asiatica	N	0.1	10	
	Cirsium vulgare	E	0.1	1	
FG	Commelina cyanea	N	0.1	5	
	Conyza bonariensis	E	0.1	5	
TG	Cupaniopsis anacardioides	N	0.1	1	
GG	Cyperus gracilis	N	0.1	10	
FG	Dianella caerulea	N	0.1	4	
FG	Dichondra repens	N	1	400	
	Ehrharta erecta	HTE	0.1	10	
FG	Einadia nutans	N	0.1	10	
TG	Eucalyptus amplifolia	N	15	8	
	Euphorbia depauperata var.	E	0.1	10	
	Fraxinus spp.	E	0.1	1	
OG	Glycine clandestina	N	0.1	10	
GG	Juncus usitatus	N	0.1	10	
	Ligustrum sinense	HTE	0.1	10	
FG	Lobelia purpurascens	N	0.1	20	
GG	Microlaena stipoides	N	80	6000	
	Monstera deliciosa	E	0.1	1	
GG	Oplismenus hirtellus	N	1	300	
	Opuntia stricta	E	0.1	1	
FG	Oxalis perennans	N	0.1	20	
	Passiflora suberosa	HTE	0.1	10	
	Setaria palmifolia	E	0.1	1	
	Sida rhombifolia	E	0.1	1	
FG	Solanum prinophyllum	N	0.5	100	
	Solanum pseudocapsicum	E	0.1	10	
GG	Themeda triandra	N	0.5	20	

BAM Plot Data Sheet				Site Sheet no:1 of 2			
		Survey Name		Veg Zone ID	Recorders		
Date	14/07/2025	Kellyville SP Staging		Moderate	NZ		
Zone 56	Datum GDA94	Plot ID	40523.B01	Plot dimensions	50x20	Orientation of middle	330
Easting 308976	Northing 6267269	IBRA region	Sydney Basin	Photo #			
Plant Community Type		3320			EEC: YES	Confidence H	

BAM Attribute (400m2 plot)			Sum values	BAM Attribute (1000m2 plot)	
Count of Native Richness	Trees		2	DBH	# Tree Stems Count
	Shrubs		1	80+ cm	0
	Grasses etc.		7	50 - 79 cm	4
	Forbs		6	30 - 49 cm	2
	Ferns		0	20 - 29cm	1
	Other		2	10 - 19 cm	1
Sum of Cover of native vascular plans by growth form group	Trees		26	5 - 9 cm	1
	Shrubs		0.3	< 5 cm	1
	Grasses etc.		76.5	Length of logs (m)	5
	Forbs		7.6	No. trees with hollows	1
	Ferns		0		
	Other		15.3		
High Threat Weed cover			1.4		

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	5	12	35	45	15
Average of the 5 subplots	22.4				

Notes	
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Flat	Soil Surface Texture	Sandy clay
Soil Colour	Dark brown	Site Drainage	Good	Distance to nearest water	50 m

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			
Storm damage			

Weediness			
Other			

400 m2 plot:Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	14/07/2025	Kellyville SP Staging	40523.B01	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
TG	Angophora floribunda	N	1	2	
	Araujia sericifera	HTE	0.2	10	
	Asparagus asparagoides	HTE	0.3	20	
	Bidens pilosa	HTE	0.1	10	
SG	Bursaria spinosa	N	0.3	6	
FG	Centella asiatica	N	0.1	20	
	Cirsium vulgare	E	0.1	5	
GG	Cynodon dactylon	N	0.5	20	
GG	Cyperus gracilis	N	0.1	5	
FG	Dianella caerulea	N	0.2	10	
FG	Dichondra repens	N	7	1000	
	Ehrharta erecta	HTE	0.2	20	
FG	Einadia nutans	N	0.1	4	
TG	Eucalyptus crebra	N	25	20	
	Galium aparine	E	0.1	5	
OG	Glycine clandestina	N	0.3	50	
OG	Glycine tabacina	N	15		
GG	Juncus usitatus	N	0.1	5	
FG	Lobelia purpurascens	N	0.1	5	
GG	Lomandra longifolia	N	0.5	10	
	Megathyrsus maximus	HTE	0.1	5	
GG	Microlaena stipoides	N	75	6000	
GG	Oplismenus hirtellus	N	0.2	20	
	Opuntia stricta	E	0.1	2	
	Paspalum dilatatum	HTE	0.3	20	
	Paspalum urvillei	HTE	0.1	5	
	Plantago lanceolata	E	0.1	1	
	Senecio madagascariensis	HTE	0.1	3	
	Setaria parviflora	E	0.3	50	
	Sida rhombifolia	E	3	100	
FG	Solanum prinophyllum	N	0.1	10	
	Solanum pseudocapsicum	E	0.5	50	
	Sonchus oleraceus	E	0.1	10	
	Taraxacum officinale	E	0.1	1	
GG	Themeda triandra	N	0.1	5	
	Verbena bonariensis	E	0.1	10	

BAM Plot Data Sheet				Site Sheet no:1 of 2			
		Survey Name		Veg Zone ID	Recorders		
Date	15/07/2025	Kellyville SP Staging		Low	NZ		
Zone 56	Datum GDA94	Plot ID	40523.B02	Plot dimensions	50x20	Orientation of middle	330
Easting 308868	Northing 6267433	IBRA region	Sydney Basin	Photo #			
Plant Community Type		3320			EEC: YES	Confidence H	

BAM Attribute (400m2 plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	0
	Grasses etc.	3
	Forbs	5
	Ferns	0
	Other	2
Sum of Cover of native vascular plants by growth form group	Trees	20
	Shrubs	0
	Grasses etc.	2.2
	Forbs	8
	Ferns	0
	Other	0.5
High Threat Weed cover		55.8

BAM Attribute (1000m2 plot)	
DBH	# Tree Stems Count
80+ cm	0
50 - 79 cm	2
30 - 49 cm	1
20 - 29cm	1
10 - 19 cm	1
5 - 9 cm	1
< 5 cm	0
Length of logs (m)	4.5
No. trees with hollows	1

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	5	10	8	10	5
Average of the 5 subplots	7.6				

Notes	
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Flat	Soil Surface Texture	Sandy clay
Soil Colour	Dark brown	Site Drainage	Good	Distance to nearest water	150

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			
Storm damage			

Weediness			
Other			

400 m2 plot:Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	15/07/2025	Kellyville SP Staging	40523.B02	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
	Asparagus asparagoides	HTE	0.1	5	
	Bidens pilosa	HTE	0.1	5	
	Cenchrus clandestinus	HTE	55	3000	
FG	Centella asiatica	N	0.7	200	
GG	Cyperus gracilis	N	0.1	10	
FG	Dichondra repens	N	7	600	
GG	Entolasia marginata	N	0.1	5	
TG	Eucalyptus moluccana	N	20	10	
OG	Glycine clandestina	N	0.1	10	
OG	Glycine tabacina	N	0.4	40	
FG	Hypericum gramineum	N	0.1	10	
	Hypochaeris glabra	E	3	100	
FG	Lobelia purpurascens	N	0.1	10	
	Lotus subbiflorus	E	0.5	70	
GG	Microlaena stipoides	N	2	80	
	Modiola caroliniana	E	0.3	40	
FG	Oxalis perennans	N	0.1	10	
	Paspalum dilatatum	HTE	0.1	10	
	Plantago lanceolata	E	4	500	
	Senecio madagascariensis	HTE	0.5	50	
	Sida rhombifolia	E	0.1	10	
	Taraxacum officinale	E	0.1	10	
	Trifolium repens	E	3	400	
	Verbena rigida var. rigida	E	0.1	10	

BAM Plot Data Sheet				Site Sheet no:1 of 2			
		Survey Name		Veg Zone ID	Recorders		
Date	15/07/2025	Kellyville SP Staging		Moderate	NZ		
Zone 56	Datum GDA94	Plot ID	40523.B03	Plot dimensions	50x20	Orientation of middle	135
Easting 308932	Northing 6267535	IBRA region	Sydney Basin	Photo #			
Plant Community Type		4025			EEC: Yes	Confidence H	

BAM Attribute (400m2 plot)		Sum values
Count of Native Richness	Trees	3
	Shrubs	2
	Grasses etc.	4
	Forbs	8
	Ferns	0
	Other	2
Sum of Cover of native vascular plants by growth form group	Trees	45.1
	Shrubs	0.2
	Grasses etc.	55.7
	Forbs	2.8
	Ferns	0
	Other	0.2
High Threat Weed cover		6

BAM Attribute (1000m2 plot)	
DBH	# Tree Stems Count
80+ cm	0
50 - 79 cm	2
30 - 49 cm	9
20 - 29cm	1
10 - 19 cm	1
5 - 9 cm	1
< 5 cm	1
Length of logs (m)	6
No. trees with hollows	2

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	2	10	85	30	65
Average of the 5 subplots	38.4				

Notes	
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Flat	Soil Surface Texture	Alluvial, sandy
Soil Colour	Dark brown	Site Drainage	Good	Distance to nearest water	50 m

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			
Storm damage			

Weediness			
Other			

400 m2 plot:Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	15/07/2025	Kellyville SP Staging	40523.B03	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
	Araujia sericifera	HTE	0.3	20	
	Asparagus asparagoides	HTE	0.1	10	
	Bidens pilosa	HTE	0.1	10	
SG	Bursaria spinosa	N	0.1	1	
TG	Casuarina glauca	N	25	50	
FG	Centella asiatica	N	2	200	
	Cirsium vulgare	E	0.1	10	
FG	Commelina cyanea	N	0.2	20	
TG	Cupaniopsis anacardioides	N	0.1	5	
	Cyperus eragrostis	HTE	0.1	1	
FG	Dianella caerulea	N	0.1	10	
	Ehrharta longiflora	E	0.1	20	
GG	Entolasia stricta	N	0.3	20	
TG	Eucalyptus amplifolia	N	20	10	
	Galium aparine	E	0.1	10	
OG	Glycine clandestina	N	0.1	10	
OG	Grona varians	N	0.1	10	
FG	Hypericum gramineum	N	0.1	10	
GG	Juncus usitatus	N	0.1	5	
FG	Lobelia purpurascens	N	0.1	10	
GG	Microlaena stipoides	N	55	5000	
GG	Oplismenus hirtellus	N	0.3	20	
FG	Oxalis spp.	N	0.1	10	
	Paspalum dilatatum	HTE	0.3	30	
	Passiflora suberosa	HTE	0.1	5	
	Plantago lanceolata	E	0.3	30	
FG	Plectranthus parviflorus	N	0.1	5	
SG	Senna spp.	N	0.1	1	
	Setaria parviflora	E	0.1	10	
	Sida rhombifolia	E	0.1	10	
FG	Solanum prinophyllum	N	0.1	5	
	Solanum pseudocapsicum	E	0.1	10	
	Sonchus oleraceus	E	0.1	10	
	Tradescantia fluminensis	HTE	5	100	

BAM Plot Data Sheet				Site Sheet no:1 of 2			
		Survey Name		Veg Zone ID	Recorders		
Date	15/07/2025	Kellyville SP Staging		Moderate	NZ		
Zone 56	Datum GDA94	Plot ID	40523.B04	Plot dimensions	50x20	Orientation of middle	315
Easting 309057	Northing 6267202	IBRA region	Sydney Basin	Photo #			
Plant Community Type		3975			EEC: None	Confidence H	

BAM Attribute (400m2 plot)			Sum values	BAM Attribute (1000m2 plot)	
Count of Native Richness	Trees		2	DBH	# Tree Stems Count
	Shrubs		0	80+ cm	0
	Grasses etc.		3	50 - 79 cm	1
	Forbs		3	30 - 49 cm	0
	Ferns		1	20 - 29cm	0
	Other		0	10 - 19 cm	1
Sum of Cover of native vascular plans by growth form group	Trees		2	5 - 9 cm	1
	Shrubs		0	< 5 cm	1
	Grasses etc.		15.3	Length of logs (m)	0
	Forbs		0.8	No. trees with hollows	1
	Ferns		2		
	Other		0		
High Threat Weed cover			1.1		

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	0	0	0	0	0
Average of the 5 subplots	0				

Notes	Centre line falls within the waterbody.
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Flat	Soil Surface Texture	Alluvial clay
Soil Colour	Dark reddish brown.	Site Drainage	Good	Distance to nearest water	Plot within water.

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			

Storm damage			
Weediness			
Other			

400 m2 plot:Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	15/07/2025	Kellyville SP Staging	40523.B04	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
TG	Angophora floribunda	N	1	1	
	Asparagus aethiopicus	HTE	0.1	10	
TG	Casuarina glauca	N	1	20	
	Cenchrus clandestinus	HTE	0.1	10	
	Centaurium erythraea	E	0.1	1	
FG	Centella asiatica	N	0.5	50	
	Erythrina crista-galli	HTE	0.3	1	
	Euphorbia depauperata var.	E	0.1	10	
EG	Hypolepis muelleri	N	2	30	
	Juncus acutus subsp. acutus	HTE	0.1	1	
GG	Juncus usitatus	N	0.2	10	
GG	Lomandra longifolia	N	0.1		
FG	Persicaria decipiens	N	0.2	5	
FG	Rumex brownii	N	0.1	1	
	Rumex crispus	E	0.1	10	
	Solanum nigrum	E	0.1	10	
	Tradescantia fluminensis	HTE	0.5	50	
GG	Typha orientalis	N	15	100	
	Verbena bonariensis	E	0.1	10	

BAM Plot Data Sheet					Site Sheet no:1 of 2		
		Survey Name		Veg Zone ID	Recorders		
Date	15/07/2025	Kellyville SP Staging		Landscape plantings	NZ		
Zone 56	Datum GDA94	Plot ID	40523.B05	Plot dimensions	50x20	Orientation of middle	140
Easting 308821	Northing 6267292	IBRA region	Sydney Basin	Photo #			
Plant Community Type		3320			EEC: Yes	Confidence H	

BAM Attribute (400m2 plot)		Sum values		BAM Attribute (1000m2 plot)	
Count of Native Richness	Trees	4		DBH	# Tree Stems Count
	Shrubs	3		80+ cm	0
	Grasses etc.	1		50 - 79 cm	0
	Forbs	3		30 - 49 cm	0
	Ferns	0		20 - 29cm	1
	Other	0		10 - 19 cm	1
Sum of Cover of native vascular plans by growth form group	Trees	9		5 - 9 cm	1
	Shrubs	2.2		< 5 cm	1
	Grasses etc.	3		Length of logs (m)	0
	Forbs	0.9		No. trees with hollows	0
	Ferns	0			
	Other	0			
High Threat Weed cover		35.4			

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	30	5	10	5	10
Average of the 5 subplots	12				

Notes	
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Flat	Soil Surface Texture	Sandy alluvial
Soil Colour	Dark brown	Site Drainage	Good	Distance to nearest water	180 m

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			

Storm damage			
Weediness			
Other			

400 m2 plot:Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	15/07/2025	Kellyville SP Staging	40523.B05	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
TG	Acacia parramattensis	N	7	20	
	Asparagus asparagoides	HTE	0.1	5	
	Bidens pilosa	HTE	0.1	20	
SG	Bursaria spinosa	N	0.1	1	
TG	Casuarina glauca	N	0.5	1	
	Cenchrus clandestinus	HTE	35	3000	
	Cirsium vulgare	E	0.1	20	
FG	Commelina cyanea	N	0.1	10	
	Conyza bonariensis	E	0.1	20	
	Crassocephalum crepidioides	E	0.1	10	
FG	Dianella caerulea	N	0.3	20	
FG	Dichondra repens	N	0.5	100	
TG	Eucalyptus moluccana	N	0.5	2	
TG	Eucalyptus tereticornis	N	1	2	
SG	Goodenia ovata	N	0.1	10	
	Hypochaeris glabra	E	0.3	30	
GG	Lomandra longifolia	N	3	10	
SG	Melaleuca decora	N	2	3	
	Modiola caroliniana	E	0.1	5	
	Paspalum urvillei	HTE	0.1	5	
	Plantago lanceolata	E	0.2	20	
	Rumex crispus	E	0.1	7	
	Senecio madagascariensis	HTE	0.1	10	
	Solanum nigrum	E	0.1	10	
	Solanum sisymbriifolium	E	0.1	1	
	Sonchus oleraceus	E	0.1	5	
	Taraxacum officinale	E	0.1	1	
	Trifolium repens	E	0.5	20	
	Verbena bonariensis	E	0.1	20	

BAM Plot Data Sheet				Site Sheet no:1 of 2		
		Survey Name		Veg Zone ID	Recorders	
Date	15/07/2025	Kellyville SP Staging		Landscape plantings	NZ	
Zone 56	Datum GDA94	Plot ID	40523.B06	Plot dimensions	50x20	Orientation of middle 150
Easting 308916	Northing 6267192	IBRA region	Sydney Basin	Photo #		
Plant Community Type		3320			EEC: None	Confidence H

BAM Attribute (400m2 plot)		Sum values		BAM Attribute (1000m2 plot)	
Count of Native Richness	Trees	3		DBH	# Tree Stems Count
	Shrubs	2		80+ cm	0
	Grasses etc.	3		50 - 79 cm	0
	Forbs	4		30 - 49 cm	1
	Ferns	0		20 - 29cm	0
	Other	0		10 - 19 cm	1
Sum of Cover of native vascular plans by growth form group	Trees	7		5 - 9 cm	1
	Shrubs	3.5		< 5 cm	1
	Grasses etc.	8.1		Length of logs (m)	5
	Forbs	0.6		No. trees with hollows	0
	Ferns	0			
	Other	0			
High Threat Weed cover		72.4			

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	2	8	0	0	3
Average of the 5 subplots	2.6				

Notes	
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Slightly hilly	Soil Surface Texture	Sandy loam
Soil Colour	Daek brown	Site Drainage	Good	Distance to nearest water	150 m2

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			

Storm damage			
Weediness			
Other			

400 m2 plot:Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	15/07/2025	Kellyville SP Staging	40523.B06	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
TG	Acacia parramattensis	N	2	4	
	Cardamine hirsuta	E	0.2	30	
TG	Casuarina glauca	N	3	5	
	Cenchrus clandestinus	HTE	70	6000	
	Centaureum erythraea	E	0.1	10	
	Cirsium vulgare	E	0.1	10	
	Conyza bonariensis	E	0.1	10	
GG	Cynodon dactylon	N	3	300	
	Cyperus eragrostis	HTE	0.1	5	
GG	Cyperus gracilis	N	0.1	2	
FG	Dianella caerulea	N	0.1	5	
FG	Dichondra repens	N	0.3	30	
TG	Eucalyptus moluccana	N	2	2	
SG	Indigofera australis	N	0.5	1	
GG	Lomandra longifolia	N	5	20	
SG	Melaleuca decora	N	3	4	
	Modiola caroliniana	E	4	200	
FG	Oxalis perennans	N	0.1	50	
	Paspalum dilatatum	HTE	2	200	
	Plantago lanceolata	E	2	200	
	Poa annua	E	0.2	90	
	Rumex crispus	E	0.1	5	
	Soliva sessilis	E	0.2	100	
	Sonchus oleraceus	E	0.1	10	
	Stenotaphrum secundatum	HTE	0.3	20	
	Taraxacum officinale	E	0.1	5	
	Trifolium repens	E	3	300	
	Verbena rigida var. rigida	E	0.1	5	
FG	Veronica plebeia	N	0.1	5	

BAM Plot Data Sheet				Site Sheet no:1 of 2		
		Survey Name		Veg Zone ID	Recorders	
Date	15/07/2025	Kellyville SP Staging		Revegetated	NZ	
Zone 56	Datum GDA94	Plot ID	40523.B07	Plot dimensions	50x20	Orientation of middle 108
Easting 308799	Northing 6267934	IBRA region	Sydney Basin	Photo #		
Plant Community Type		4025			EEC: Yes	Confidence H

BAM Attribute (400m2 plot)		Sum values
Count of Native Richness	Trees	5
	Shrubs	2
	Grasses etc.	5
	Forbs	8
	Ferns	0
	Other	1
Sum of Cover of native vascular plants by growth form group	Trees	40.3
	Shrubs	0.4
	Grasses etc.	26.8
	Forbs	1.3
	Ferns	0
	Other	0.2
High Threat Weed cover		38.3

BAM Attribute (1000m2 plot)	
DBH	# Tree Stems Count
80+ cm	0
50 - 79 cm	0
30 - 49 cm	4
20 - 29cm	1
10 - 19 cm	1
5 - 9 cm	1
< 5 cm	1
Length of logs (m)	50
No. trees with hollows	0

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	75	15	15	3	90
Average of the 5 subplots	39.6				

Notes	
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Flat with a small hill.	Soil Surface Texture	Sandy loam
Soil Colour	Light to dark brown	Site Drainage	Good	Distance to nearest water	20 m

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			

Storm damage			
Weediness			
Other			

400 m2 plot:Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	15/07/2025	Kellyville SP Staging	40523.B07	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
TG	Acacia parramattensis	N	20	40	
	Araujia sericifera	HTE	0.2	20	
	Asparagus asparagoides	HTE	0.1	10	
	Bidens pilosa	HTE	0.3	30	
SG	Bursaria spinosa	N	0.3	10	
TG	Casuarina glauca	N	0.2	8	
	Cenchrus clandestinus	HTE	35	3000	
FG	Centella asiatica	N	0.3	100	
	Cirsium vulgare	E	0.1	10	
	Conyza bonariensis	E	0.1	1	
TG	Corymbia maculata	N	10	2	
TG	Cupaniopsis anacardioides	N	0.1	1	
FG	Dichondra repens	N	0.1	10	
	Ehrharta erecta	HTE	0.1	20	
FG	Einadia nutans	N	0.1	10	
FG	Einadia trigonos	N	0.1	1	
GG	Entolasia marginata	N	0.1	10	
TG	Eucalyptus amplifolia	N	10	4	
OG	Glycine tabacina	N	0.2	400	
FG	Goodenia hederacea	N	0.1	10	
FG	Hypericum gramineum	N	0.1	9	
GG	Imperata cylindrica	N	0.5	50	
GG	Juncus usitatus	N	0.2	20	
	Ligustrum sinense	HTE	2	50	
FG	Lobelia purpurascens	N	0.4	100	
GG	Lomandra longifolia	N	1	20	
GG	Microlaena stipoides	N	25	2000	
	Ochna serrulata	HTE	0.1	1	
	Opuntia stricta	E	0.1	1	
SG	Ozothamnus diosmifolius	N	0.1	5	
	Paspalum dilatatum	HTE	0.1	10	
	Passiflora suberosa	HTE	0.3	30	
	Plantago lanceolata	E	0.5	60	
FG	Plectranthus parviflorus	N	0.1	2	
	Senecio madagascariensis	HTE	0.1	5	
	Sida rhombifolia	E	0.2	30	

	Solanum sisymbriifolium	E	0.1	10	
	Soliva sessilis	E	0.1	10	
	Sonchus oleraceus	E	0.1	10	
	Taraxacum officinale	E	0.1	20	
	Verbena bonariensis	E	0.1	5	

BAM Plot Data Sheet					Site Sheet no:1 of 2		
		Survey Name		Veg Zone ID	Recorders		
Date	16/07/2025	Kellyville SP Staging		Exotic groundcover	NZ		
Zone 56	Datum GDA94	Plot ID	40523.B08	Plot dimensions	50x20	Orientation of middle	55
Easting 308887	Northing 6267372	IBRA region	Sydney Basin	Photo #			
Plant Community Type		0			EEC: None	Confidence M	

BAM Attribute (400m2 plot)			Sum values		BAM Attribute (1000m2 plot)	
Count of Native Richness	Trees		0		DBH	# Tree Stems Count
	Shrubs		0		80+ cm	0
	Grasses etc.		3		50 - 79 cm	0
	Forbs		4		30 - 49 cm	0
	Ferns		0		20 - 29cm	0
	Other		1		10 - 19 cm	0
Sum of Cover of native vascular plans by growth form group	Trees		0		5 - 9 cm	0
	Shrubs		0		< 5 cm	0
	Grasses etc.		55.6		Length of logs (m)	4
	Forbs		0.8		No. trees with hollows	0
	Ferns		0			
	Other		0.1			
High Threat Weed cover			31.2			

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	0	2	3	5	0
Average of the 5 subplots	2				

Notes	
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Flat	Soil Surface Texture	Alluvial, clay
Soil Colour	Dark brown	Site Drainage	Good	Distance to nearest water	50 m

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			

Storm damage			
Weediness			
Other			

400 m2 plot: Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	16/07/2025	Kellyville SP Staging	40523.B08	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
	Acetosella vulgaris	HTE	0.1	20	
	Cardamine hirsuta	E	0.1	20	
	Cenchrus clandestinus	HTE	5	200	
FG	Centella asiatica	N	0.5	500	
	Cerastium glomeratum	E	0.1	10	
	Cirsium vulgare	E	0.1	20	
	Conyza bonariensis	E	0.1	5	
GG	Cynodon dactylon	N	55	5000	
FG	Dichondra repens	N	0.1	50	
GG	Entolasia stricta	N	0.1	20	
OG	Glycine tabacina	N	0.1	10	
FG	Hypericum gramineum	N	0.1	50	
GG	Microlaena stipoides	N	0.5	50	
	Modiola caroliniana	E	0.1	5	
FG	Oxalis perennans	N	0.1	10	
	Paspalum dilatatum	HTE	25	2000	
	Plantago lanceolata	E	5	500	
	Poa annua	E	0.1	30	
	Romulea rosea var. australis	HTE	1	100	
	Senecio madagascariensis	HTE	0.1	10	
	Taraxacum officinale	E	0.1	20	
	Trifolium repens	E	0.2	20	
	Vicia sativa	E	0.1	10	

BAM Plot Data Sheet					Site Sheet no:1 of 2		
		Survey Name		Veg Zone ID	Recorders		
Date	16/07/2025	40523.B09		Exotic vegetation	JRS, NZ		
Zone 56	Datum GDA94	Plot ID	40523.B09	Plot dimensions	100x10	Orientation of middle	211
Easting 308922	Northing 6267421	IBRA region	Sydney Basin	Photo #			
Plant Community Type					EEC: None	Confidence L	

BAM Attribute (400m2 plot)		Sum values	BAM Attribute (1000m2 plot)	
Count of Native Richness	Trees	0	DBH	# Tree Stems Count
	Shrubs	1	80+ cm	0
	Grasses etc.	4	50 - 79 cm	0
	Forbs	5	30 - 49 cm	7
	Ferns	0	20 - 29cm	1
	Other	1	10 - 19 cm	1
Sum of Cover of native vascular plans by growth form group	Trees	0	5 - 9 cm	1
	Shrubs	6	< 5 cm	0
	Grasses etc.	40.3	Length of logs (m)	10
	Forbs	7.8	No. trees with hollows	0
	Ferns	0		
	Other	0.1		
High Threat Weed cover		61.9		

BAM Attibute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	10	5	5	5	20
Average of the 5 subplots	9				

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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Flat	Soil Surface Texture	Sandy
Soil Colour	Light brown	Site Drainage	Good	Distance to nearest water	

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)	3	NR	
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			

Storm damage			
Weediness	2	NR	
Other			

400 m2 plot:Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	16/07/2025	40523.B09	40523.B09	JRS, NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
	Araujia sericifera	HTE	0.5	3	
	Asparagus asparagoides	HTE	0.5	50	
FG	Centella asiatica	N	0.5	200	
	Conyza bonariensis	E	0.1	10	
	Cyclospermum leptophyllum	E	0.1	2	
GG	Cynodon dactylon	N	0.2	50	
	Cyperus rotundus	E	0.1	5	
FG	Dianella revoluta var. revoluta	N	0.1	3	
FG	Dichondra repens	N	5	500	
GG	Entolasia marginata	N	0.1	5	
OG	Glycine tabacina	N	0.1	10	
SG	Hakea salicifolia	N	6	20	
FG	Hypericum gramineum	N	2	100	
	Ligustrum sinense	HTE	0.5	1	
	Lotus subbiflorus	E	0.1	3	
GG	Microlaena stipoides	N	35	3000	
	Onopordum acanthium subsp.	E	0.2	10	
GG	Oplismenus hirtellus	N	5	400	
FG	Oxalis perennans	N	0.2	20	
	Paspalum dilatatum	HTE	25	2000	
	Pinus radiata	HTE	35	20	Canopy
	Plantago lanceolata	E	2	100	
	Rubus fruticosus sp. agg.	HTE	0.2	5	
	Senecio madagascariensis	HTE	0.2	30	
	Sida rhombifolia	E	0.2	50	
	Solanum pseudocapsicum	E	0.1	1	
	Taraxacum officinale	E	0.5	50	
	Trifolium repens	E	0.2	50	

BAM Plot Data Sheet				Site Sheet no:1 of 2			
		Survey Name		Veg Zone ID	Recorders		
Date	16/07/2025	Kellyville SP Staging		Moderate	NZ		
Zone 56	Datum GDA94	Plot ID	40523.B10	Plot dimensions	50x20	Orientation of middle	4
Easting 308993	Northing 6267455	IBRA region	Sydney Basin	Photo #			
Plant Community Type		4025			EEC: Yes	Confidence H	

BAM Attribute (400m2 plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	0
	Grasses etc.	3
	Forbs	9
	Ferns	0
	Other	2
Sum of Cover of native vascular plans by growth form group	Trees	47
	Shrubs	0
	Grasses etc.	30.8
	Forbs	1.3
	Ferns	0
	Other	0.2
High Threat Weed cover		51.2

BAM Attribute (1000m2 plot)	
DBH	# Tree Stems Count
80+ cm	0
50 - 79 cm	1
30 - 49 cm	4
20 - 29cm	1
10 - 19 cm	1
5 - 9 cm	1
< 5 cm	1
Length of logs (m)	15
No. trees with hollows	1

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	20	40	10	5	15
Average of the 5 subplots	18				

Notes	
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Fairly flat, slighting dips towards the creek line.	Soil Surface Texture	Sandy loam
Soil Colour	Dark brown	Site Drainage	Good	Distance to nearest water	Plot occurs directly adjacent to the creek.

Plot Disturbance	Severity code	Age code	Observational evidence
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Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			
Storm damage			
Weediness			
Other			

400 m2 plot: Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	16/07/2025	Kellyville SP Staging	40523.B10	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
	Araujia sericifera	HTE	0.3	30	
	Asparagus asparagoides	HTE	0.2	30	
	Bidens pilosa	HTE	0.1	20	
TG	Casuarina glauca	N	45	400	
FG	Centella asiatica	N	0.1	50	
	Chloris gayana	HTE	0.1	10	
	Cirsium vulgare	E	0.1	10	
FG	Commelina cyanea	N	0.1	10	
	Conyza bonariensis	E	0.1	2	
FG	Dichondra repens	N	0.3	100	
	Ehrharta erecta	HTE	35	3000	
FG	Einadia hastata	N	0.1	1	
FG	Einadia nutans	N	0.1	10	
TG	Eucalyptus moluccana	N	2	1	
	Galium aparine	E	0.1	30	
OG	Glycine clandestina	N	0.1	5	
OG	Glycine tabacina	N	0.1	20	
GG	Juncus usitatus	N	0.3	20	
FG	Lobelia purpurascens	N	0.1	10	
GG	Microlaena stipoides	N	30	2000	
	Morus alba	E	0.3	1	
	Ochna serrulata	HTE	0.1	1	
GG	Oplismenus hirtellus	N	0.5	80	
	Opuntia stricta	E	0.1	1	
FG	Oxalis perennans	N	0.1	10	
	Passiflora suberosa	HTE	0.3	30	
	Plantago lanceolata	E	0.1	10	
FG	Rumex brownii	N	0.1	5	
	Rumex crispus	E	0.1	5	
	Setaria palmifolia	E	0.1	1	

	<i>Sida rhombifolia</i>	E	0.1	10	
	<i>Solanum nigrum</i>	E	0.1	2	
FG	<i>Solanum prinophyllum</i>	N	0.3	30	
	<i>Solanum pseudocapsicum</i>	E	0.5	50	
	<i>Solanum seaforthianum</i>	HTE	0.1	2	
	<i>Sonchus oleraceus</i>	E	0.1	10	
	<i>Taraxacum officinale</i>	E	0.1	10	
	<i>Tradescantia fluminensis</i>	HTE	15	500	

BAM Plot Data Sheet				Site Sheet no:1 of 2			
		Survey Name		Veg Zone ID	Recorders		
Date	16/07/2025	Kellyville SP Staging		Moderate	NZ		
Zone 56	Datum GDA94	Plot ID	40523.B11	Plot dimensions	50x20	Orientation of middle	330
Easting 309015	Northing 6267207	IBRA region	Sydney Basin	Photo #			
Plant Community Type		3320			EEC: Yes	Confidence H	

BAM Attribute (400m2 plot)		Sum values
Count of Native Richness	Trees	5
	Shrubs	1
	Grasses etc.	6
	Forbs	8
	Ferns	0
	Other	1
Sum of Cover of native vascular plants by growth form group	Trees	38.3
	Shrubs	10
	Grasses etc.	81.8
	Forbs	2.1
	Ferns	0
	Other	0.1
High Threat Weed cover		0.7

BAM Attribute (1000m2 plot)	
DBH	# Tree Stems Count
80+ cm	1
50 - 79 cm	2
30 - 49 cm	1
20 - 29cm	1
10 - 19 cm	1
5 - 9 cm	1
< 5 cm	1
Length of logs (m)	17
No. trees with hollows	2

BAM Attribute (1 x 1m plots)	Litter cover (%)				
Subplot score (% in each)	10	20	25	30	35
Average of the 5 subplots	24				

Notes	
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Physiography + site features that may help in determining PCT and Management Zone

Landform Pattern		Slope	Flate	Soil Surface Texture	Sandy clay
Soil Colour	Dark reddish brown	Site Drainage	Good	Distance to nearest water	40 m

Plot Disturbance	Severity code	Age code	Observational evidence
Clearing inc. logging)			
Cultivation (inc. pasture)			
Soil erosion			
Firewood/CWD removal			
Grazing (identify native/livestock			
Fire damage			
Storm damage			

Weediness			
Other			

400 m2 plot:Sheet 2 of 2		Survey Name	Plot ID	Recorders
Date	16/07/2025	Kellyville SP Staging	40523.B11	NZ

GF Code	Genus species	N,E or HTE	Cover	Abund	Stratum
TG	Acacia parramattensis	N	3	30	
TG	Angophora floribunda	N	20	20	
	Araujia sericifera	HTE	0.1	10	
	Asparagus asparagoides	HTE	0.3	50	
SG	Bursaria spinosa	N	10	100	
	Canna spp.	E	0.1	1	
GG	Carex inversa	N	0.1	10	
TG	Casuarina glauca	N	0.2	5	
FG	Centella asiatica	N	0.1	10	
	Cirsium vulgare	E	0.1	1	
FG	Commelina cyanea	N	0.1	5	
	Conyza bonariensis	E	0.1	5	
TG	Cupaniopsis anacardioides	N	0.1	1	
GG	Cyperus gracilis	N	0.1	10	
FG	Dianella caerulea	N	0.1	4	
FG	Dichondra repens	N	1	400	
	Ehrharta erecta	HTE	0.1	10	
FG	Einadia nutans	N	0.1	10	
TG	Eucalyptus amplifolia	N	15	8	
	Euphorbia depauperata var.	E	0.1	10	
	Fraxinus spp.	E	0.1	1	
OG	Glycine clandestina	N	0.1	10	
GG	Juncus usitatus	N	0.1	10	
	Ligustrum sinense	HTE	0.1	10	
FG	Lobelia purpurascens	N	0.1	20	
GG	Microlaena stipoides	N	80	6000	
	Monstera deliciosa	E	0.1	1	
GG	Oplismenus hirtellus	N	1	300	
	Opuntia stricta	E	0.1	1	
FG	Oxalis perennans	N	0.1	20	
	Passiflora suberosa	HTE	0.1	10	
	Setaria palmifolia	E	0.1	1	
	Sida rhombifolia	E	0.1	1	
FG	Solanum prinophyllum	N	0.5	100	
	Solanum pseudocapsicum	E	0.1	10	
GG	Themeda triandra	N	0.5	20	

Appendix 4 Fauna

Table A 3 Fauna species recorded at the subject land

Common name	Scientific name
Mammals	
Black Rat	<i>Rattus rattus</i>
Brushtail possum	<i>Trichosurus vulpecula</i>
Common Ringtail Possum	<i>Pseudocheirus peregrinus</i>
Fox	<i>Vulpes vulpes</i>
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>
Rabbit	<i>Oryctolagus cuniculus</i>
White-striped Freetail-bat	<i>Austronomus australis</i>
Eastern Cave Bat	<i>Vespadelus troughtoni</i>
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>
Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>
Little Bent-winged Bat	<i>Miniopterus australis</i>
Birds	
Australian Magpie	<i>Cracticus tibicen</i>
Australian Raven	<i>Corvus coronoides</i>
Australian Wood Duck	<i>Chenonetta jubata</i>
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>
Common Crow	<i>Euploea core</i>
Dusky Moorhen	<i>Gallinula tenebrosa</i>
Grey Butcherbird	<i>Cracticus torquatus</i>
Laughing Kookaburra	<i>Dacelo novaeguineae</i>
Magpie-lark	<i>Grallina cyanoleuca</i>
Nankeen Night Heron	<i>Nycticorax caledonicus</i>
Noisy Miner	<i>Manorina melanocephala</i>
Pied Currawong	<i>Strepera graculina</i>
Rainbow Lorikeet	<i>Trichoglossus haematodus</i>
Superb Fairy-wren	<i>Malurus cyaneus</i>
Tawny Frogmouth	<i>Podargus strigoides</i>
White-faced Heron	<i>Egretta novaehollandiae</i>
Yellow-billed Spoonbill	<i>Platalea flavipes</i>

Common name	Scientific name
Reptiles	
Eastern Water Dragon	<i>Intellagama lesueurii lesueurii</i>
Pale-flecked Garden Sunskink	<i>Lampropholis guichenoti</i>
Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>
Frogs	
Common Eastern Froglet	<i>Crinia signifera</i>
Peron's Tree Frog	<i>Litoria peronii</i>
Fish	
Mosquito Fish	<i>Gambusia holbrooki</i>

Appendix 5 SAIL

Appendix 5.1 Cumberland Plain Woodland in the Sydney Basin Bioregion

Community background

The *Cumberland Plain Woodland in the Sydney Basin Bioregion* (PCT 3320) is listed under the NSW BC Act as a Critically Endangered Ecological Community. The CEEC is listed in the BioNet TBDC as an entity at risk of SAIL based on the following principles (DPIE 2019):

- Principle 1: an ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline.
- Principle 2: an ecological community that is observed, inferred or reasonably suspected to be severely degraded or disturbed.

Occurrence in the subject land

There is approximately 5.73 hectares of the CEEC mapped within the subject land, including:

- 2.06 ha of moderate condition PCT 3320, part of a 2.99 ha continuous patch (moderate and low condition) extending to the south and west.
- 0.28 ha of low condition PCT 3320.
- 3.39 ha of landscape plantings condition PCT 3320.

Impacts to the CEEC include:

- The removal of 1.96 ha of PCT 3320 Landscape Plantings.
- The removal of 0.27 ha of PCT 3320 Low.
- The removal of 1.95 ha of PCT 3320 Moderate.

Given the absence of definitive impact thresholds stated for the community, the potential for a SAIL will be determined by the consent authority, guided by the additional assessment provided below.

Table A 4 SAIL assessment for Cumberland Plain Woodland in the Sydney Basin Bioregion

Information required (BAM Section 9.1.1)	Response
1. Impacts to the CEEC and the action and measures taken to avoid the direct and indirect impact on the CEEC at risk of an SAIL.	
-	The project will impact upon a total of approximately 4.18 ha of PCT 3320 vegetation that meets the BC Act listing requirements for Cumberland Plain Woodland CEEC. The vegetation to be removed occurs in the following conditions: • Landscape Plantings: 1.96 ha – VI score of 12.4 • Low: 0.27 ha – VI score of 26.5 • Moderate: 1.95 ha – VI score of 68.4 Measures and actions undertaken by the proponent to avoid and minimise impacts to the

Information required (BAM Section 9.1.1)	Response
	CEEC (PCT 3320) are provided in Section 5 of this BDAR. The location and layout of the project was determined through strategic assessment and guided by the Concept Plan, which was developed in accordance with the NSW Government's housing and employment targets for the Kellyville SP. As such, opportunities to completely avoid, or further minimise impacts to the CEEC are limited. Design refinements focussing on the use of retaining walls over battering to reduce the direct impacts to the CEEC along the southern boundary of the development footprint have been implemented to minimise impacts. No further opportunities are available during the design stage of the project to reduce impacts and remain aligned with the Approved Concept Plan. Post-approval opportunities for avoidance and minimisation of impacts to Cumberland Plain Woodland include: • Cumberland Plain Woodland CEEC will be further retained and rehabilitated within open space areas proposed as part of the Concept Plan. • Where possible, trees that form part of the Cumberland Plain Woodland CEEC will be investigated for retention within Lots and Parks proposed as part of the Concept Plan. • All impacts the Cumberland Plain Woodland CEEC will be offset via the purchase of credits. • Mitigation and management measures will also be put in place to adequately protect the biological diversity of native flora and fauna within the subject land, including the Cumberland Plain Woodland CEEC, from indirect impacts through the implementation of a CEMP in accordance with the Conditions of Approval. Further avoidance of Cumberland Plain Woodland CEEC could not be undertaken while still meeting the non-biodiversity related requirements and targets for the precinct. It needs to be noted that the SAIL assessment for impacts to Cumberland Plain Woodland CEEC completed for the Concept Plan BDAR, did not include impacts to planted vegetation considered to meet the criteria for BC Act listed. This is perhaps justified under the previous version of the NSW BAM (under which that assessment was undertaken), however under the current BAM (2020) planted vegetation is expected to be included. This discrepancy implies a greater increase in impacts to Cumberland Plain Woodland CEEC than has actually resulted. The Concept Plan BDAR SAIL assessments considers 2.05 ha of the CEEC as impacted, but when including the planted vegetation mapped within the 'Development site' boundary, the impacts increase to 4.15 ha of the CEEC. This is comparable to the total 4.18ha of CEEC vegetation considered herein. As outlined in Section 5.2 above, the efforts made to further avoid and minimise impacts to biodiversity values between the Concept Plan BDAR and the current project footprint have exhausted available opportunities to do so, whilst maintaining the project's housing delivery objectives. As such, residual impacts are considered unavoidable and the BC Act Avoid, Minimise and Offset hierarchy has been implemented to the fullest extent possible for the design and approvals phase of the project. Further opportunities to apply the hierarchy during construction and operation outlined, above and in Table 35 and Table 40.
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 of the proposal)	
-	Species and ecological communities that have undergone large reductions or are likely to undergo large reductions in the future are considered to be at greater risk of extinction

Information required (BAM Section 9.1.1)	Response
	than those that have undergone or are likely to undergo smaller reductions (NSW TSSC 2018). To be considered under this principle, the ecological community should have been observed, estimated, inferred, or reasonably suspected to have undergone, or be projected to undergo, a very large reduction in distribution, being: • $\geq 80\%$ reduction where the reduction is over a 50-year period (i.e. since 1970), either in the past, future, or any part of the past, present and future (DPIE 2019). Prior to European settlement, Cumberland Plain Woodland was extensive across the Western Sydney area, and is estimated to have covered approximately 125,446 ha (DEC 2005, NPWS 2004). Whilst formerly extensive, the community now mostly occurs as small patches within the Cumberland IBRA subregion, with some occurrences extending into neighboring subregions. It is known to occur within the following LGAs: Auburn, Bankstown, Baulkham Hills, Blacktown, Camden, Campbelltown, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta, Penrith and Wollondilly (DoEWHA 2010). Whilst there is no guidance as to the proportion of geographic distribution reduction that has occurred over the last 50 years (i.e. since 1970), the fact that the CEEC is noted in the SAI guidance document (DPIE 2019) as being subject to Principle 1, infers that it has occurred in recent times, and therefore at a rapid rate. According to <i>NSW State Vegetation Type Map (SVTM C2.0M2.1)</i> (NSW DCCEEW 2024b) and <i>Native Vegetation of Southeast NSW: A Revised Classification and Map for the Coast and Eastern Tablelands</i> (Tozer et al. 2010), the current extent of Cumberland Plain Woodland (PCT 3320) within NSW is approximately 22,774 ha. This is a total reduction of approximately 82 % of the geographic distribution.
2b. Extent of reduction in ecological function for the TEC using evidence that describes the degree of environmental degradation or disruption to biotic processes. (SAII Principle 2)	
i. change in community structure, ii. change in species composition, iii. disruption of ecological processes	Reduction in ecological function relates to the IUCN principle of “very small population size” which for ecological communities means communities have very high levels of either environmental degradation or disruption of biotic processes, and interactions have an increased risk of failure to sustain their characteristic native species assemblages (Bland et al. 2016). Ecological communities that are considered to have a very large degree of environmental degradation or disruption of biotic processes or interactions are those with: • $\geq 90\%$ extent and severity where the disruption or impacts are measured since 1970. • $\geq 80\%$ extent and severity where the disruption or impacts are over a 50-year period, either in the past, future, or any part of the past, present and future (as per (Bland et al. 2016). (DPIE 2019). The initial reduction in Cumberland Plain Woodland was due to tree-felling for timber and clearing for crops and pastures. This decline has accelerated since World War II, where there was a marked acceleration in urban and industrial development in the region, which continues to present day. Now, almost all of the remaining areas of the community are either regrowth forest or degraded woodland impacted by past clearing activities (OEH 2019). The final determination for Cumberland Plain Woodland notes that changes in community structure contribute to a very large reduction in the overall ecological functioning of Cumberland Plain Woodland (OEH 2019). Large trees that were once common prior to

Information required (BAM Section 9.1.1)	Response
	European settlement now occur very sparsely within the remaining patches of woodland or remain as isolated individuals within paddocks or urban areas. Loss of these large trees has contributed to the decline and extinctions in native bird and mammal species, once common throughout the Cumberland Plain, and the associated ecological processes they once supported. Other structural changes include the removal of fallen woody debris and standing dead trees, removal of woody understorey plants (OEH 2019). Changes in species composition over time have occurred a result of clearing vegetation for agricultural process and the selective retention of trees. The proportion of native and characteristic understorey grasses, forbs, shrubs, etc., now present within the CEEC as a whole has been reduced by this process, which has been further exacerbated by the invasion of understorey weed species.
iv. invasion and establishment of exotic species v. degradation of habitat vi. fragmentation of habitat.	Invasion of remnant woodland by exotic species poses a major threat to Cumberland Plain Woodland, with very large numbers of weed species invading many different areas of the community. These species degrade the community through smothering of indigenous plants, reducing both reproduction and survival, and by inhibiting the emergence and establishment of new seedlings (OEH 2019). These exotic weed species are now rapidly changing the structure and composition of Cumberland Plain Woodland remnants and pose a major problem for management (Benson & Howell 2002). Fragmentation has also resulted in a very large reduction in the ecological function of Cumberland Plain Woodland, with the remaining areas of the community being severely fragmented. The final determination for the community states that more than half of the remaining tree cover mapped by Tozer (2003) occurs in patches of less than 80 ha, with half of all mapped patches being smaller than 3 ha (OEH 2019). Whilst there is no guidance as to the proportion of this degradation has occurred in the last 50 years (i.e. since 1970), the fact that the EEC is noted in the SAI guidance document (DPIE 2019) as being subject to Principle 2, infers that it has occurred in recent times.
2c. evidence of restricted geographic distribution (Principle 3, clause 6.7(2)(c) BC Regulation), based on the TEC's geographic range in NSW according to the:	
i. extent of occurrence ii. area of occurrence	The geographic distribution of ecological communities is defined by the area of occupancy, sensu (Bland et al. 2016). Ecological communities with a very limited geographic distribution have an area of occupancy of less than or equal to two 10 x 10 km grid cells (200 km²) or an extent of occurrence of ≤1,000 km², sensu (Bland et al. 2016), and one of the following: • An observed or inferred continuing decline in: ○ A measure of spatial extent appropriate to the ecological community. ○ A measure of environmental quality appropriate to characteristic biota of the ecological community. ○ A measure of disruption to biotic interactions appropriate to the characteristic biota of the ecological community. • Observed or inferred threatening processes that are likely to cause continuing declines in geographic distribution, environmental quality or biotic interactions within the next 20 years. • An ecological community that exists at one location (DPIE 2019). According to the final determination for the CEEC, Cumberland Plain Woodland is estimated to occur within an extent of occurrence of 2,810 km² and an area of occupancy of just under 2,100 km² based on 2 x 2 km grid cells (OEH 2019).

Information required (BAM Section 9.1.1)	Response
iii. number of threat-defined locations	There are no specific threat defined locations listed in the TBDC for the community. However, whilst the community is represented within conservation reserves, much of the remaining area occurs on private land or public easements, putting it at risk from small-scale clearing associated with housing, industrial development and transport infrastructure. Given the low area of occupancy and the facts that land-clearing is likely to remain a threatening process contributing to the decline of this community over the next twenty years, the CEEC can be considered a highly geographically restricted community. Based on the available information the CEEC does not currently meet the thresholds for consideration under SAI Principle 3.
2d. Evidence that the TEC is unlikely to respond to management (Principle 4, clause 6.7(2)(d) BC Regulation)	
-	This principle encompasses two components, firstly whether there are any particular traits of the community which limits its' response to management, and secondly whether there are any key threatening processes affecting the community which cannot be effectively managed (DPIE 2019). Conservation management of the community in areas subjected to historical clearing and agricultural grazing has resulted in some measurable recovery, provided the soil has not been disturbed by earthworks, cultivation, fertiliser application or other means of nutrient of moisture enrichment (OEH 2019). Conversely in areas that have been exposed to these soil disturbances, restoration has been proven to be problematic, with one abandoned pasture planting site showing no evidence of convergence in species composition with nearby remnant woodland stands over a 10 year period (OEH 2019). However, several management measures are detailed within the TBDC for this community. These include: • Community and land-holder liaison/ awareness and/or education. • Habitat management: Fire. • Habitat management: Ongoing EIA - Advice to consent and planning authorities. • Habitat management: Promote regeneration by avoiding mowing or prolonged or heavy grazing. • Habitat management: Protect habitat by controlling run-off entering the site if it would change water, nutrient or sediment levels or cause erosion. • Habitat management: Weed Control. • Habitat Rehabilitation/Restoration and/or Regeneration. Generally those entities which are listed as unlikely to respond to management (and thus are irreplaceable) tend to include species where the ability to control key threats is negligible and known reproductive characteristics that severely limit their ability to increase the existing population (DPIE 2019). Ecological communities as a whole do not typically align well with these criteria. The response to management practices of Cumberland Plain Woodland has been demonstrated to be based on site specific conditions and therefore it is does not meet SAI Principle 4.
3. Where the TBDC indicates data is 'unknown' or 'data deficient' for a TEC, the assessor must record this in the BDAR or BCAR.	
-	Not applicable.

Information required (BAM Section 9.1.1)	Response
4a. The impact on the geographic extent of the TEC, by estimating the total area of the TEC to be impacted by the proposal.	
i. in hectares ii. as a percentage of the current geographic extent of the TEC in NSW.	As discussed above, the current extent of Cumberland Plain Woodland within NSW is approximately 22,774 ha. The CEEC is known to occur as small patches within the Cumberland IBRA subregion, with some occurrences extending into neighboring subregions. It is known to occur within the following LGAs: Auburn, Bankstown, Baulkham Hills, Blacktown, Camden, Campbelltown, Fairfield, Hawkesbury, Holroyd, Liverpool, Parramatta, Penrith and Wollondilly (OEH 2019, DoEWHA 2010). Direct impacts The proposed development will result in the removal of approximately 4.18 ha of the CEEC within the development footprint. As such the total area of the CEEC to be impacted by the project equates to 0.02 % of the CEEC within NSW. The vegetation occurs in the following conditions: • Landscape Plantings: 1.96 ha – VI score of 12.4 • Low: 0.27 ha – VI score of 26.5 • Moderate: 1.95 ha – VI score of 68.4 Indirect impacts Increases in direct impacts to Cumberland Plain Woodland associated with factors such as increased edge effects, altered fire regimes, and transport of weeds and pathogens are not expected to be substantial or significant, largely due to the already disturbed and edge effected nature of the CEEC within the development footprint / subject land and broader vicinity. Impacts associated with altered hydrological patterns associated with installation of stormwater infrastructure have the potential to impact upon Cumberland Plain Woodland where it occurs in close proximity to the riparian corridor, however this is unlikely to be a substantial level of impact.
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:	
i. estimating the size of any remaining, but now isolated, areas of the TEC; including areas of the TEC within 500m of the development footprint or equivalent area for other types of proposals.	Cumberland Plain Woodland present in the wider landscape surrounding the project area occurs in an already highly fragmented state. GIS was used to determine the range and average size of mapped (Biosis 2025, SVTM 2025 [outside the subject land]) occurrences of Cumberland Plain Woodland within a 500 m buffer of the development footprint / subject land. The results of which are provided below both for those patches intersected by the development footprint / subject land (i.e. subject to vegetation removal) and those patches not intersected by the development footprint / subject land (i.e. not directly impact by the project). Mapped patches within 500 m directly impacted (post impact): Size range: 0.001 ha to 1.06 ha Average size: 0.14 ha Total no. mapped polygons: 10 Total area: 1.37 ha Mapped patches within 500 m not directly impacted (post impact): Size range: <0.001 ha to 1.38 ha Average size: 0.05 ha Total no. mapped polygons: 88 Total area: 4.83 ha

Information required (BAM Section 9.1.1)	Response
	The above data illustrates two important considerations, firstly that Cumberland Plain Woodland already occurs in a highly fragmented and patchy state around and within the subject land, and that after the impacts associated with the project, there will still be almost 5 ha of non-directly impacted Cumberland Plain Woodland vegetation within 500m of the development footprint. It is acknowledged that around 25-30% of this vegetation is likely to equate to planted Cumberland Plain Woodland vegetation.
ii describing the impacts on connectivity and fragmentation of the remaining areas of TEC measured by: - 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 - 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 the development	GIS was used to undertake a nearest neighbour analysis of mapped occurrences of Cumberland Plain Woodland (Biosis 2025, SVTM 2025 [outside the subject land]) prior to and post vegetation to determine the distance between impacted areas of the CEEC before and after the proposed vegetation removal. The average distance between mapped occurrences of Cumberland Plain Woodland within a 500 m buffer of the development footprint / subject land, include: • 21.50 m before development. • 22.08 m after development. Based on the above there will be an average increase of 0.58 m separation between retained patches of Cumberland Plain Woodland within 500 m of the development footprint / subject land. This is not considered to be a material increase in fragmentation. Native flora species characteristic of the CEEC include a range trees, shrubs, grasses, forbs and other groundcover species, the majority of which are dispersed via wind or animal vectors, with some species primary method of dispersal likely to be via non-flying insects such as ants. The increase in average separation distance by 0.58 m for mapped Cumberland Plain Woodland within 500 m of the development footprint / subject land, is not expected to result in a significant or substantial impediment to the dispersal of native species between retained patches, in an already highly fragmented landscape. It is noted in EPBC Act conservation advice documents that allowances can be made for “breaks” of up to 30 metres between areas of MNES habitat, and that such breaks, which may be the result of watercourses, tracks, paths, roads, etc., do not significantly alter the overall functionality of the ecological community, or habitat (CoA 2020). The majority of Cumberland Plain Woodland within the subject land are in a relatively poor condition, including the Landscape Plantings with a VI score of 12.4, and Low condition vegetation with a VI score of 26.5, and impacts to these poorer areas equate to >50% of the total impacts to the CEEC. The remainder of the impacted vegetation occurs in a Moderate condition state, with a VI score of 68.4, however an area of approximately 0.9 ha of the CEEC in similar condition will be retained to the south and west. The proposed works will remove remnant Cumberland Plain Woodland vegetation, however species present within the patches to be removed are also present in retained areas and as such a substantial change in community structure or species composition at the local scale is not expected to occur. As much of the vegetation within the subject land contained a moderate cover of common exotic species, particularly in the understory, including priority weeds and High Threat Weeds, it is unlikely that the works would significantly increase the establishment of exotic species. The proposed works will increase the separation distance between the retained patches to the community to the north and south of the subject land, via removal of the patch in the centre of the site and the smaller stepping stone patches slightly further north. Connectivity is maintained, albeit through different vegetation types, along the riparian corridor however. The project will increase the area to perimeter ratio of retained patches, which

Information required (BAM Section 9.1.1)	Response
	may in turn increase edge effects, however as illustrated by the GIS analysis presented above, the CEEC already occurs in a highly patchy and fragmented landscape. In accordance with the Conditions of Approval, a CEMP will be prepared to manage the retained Cumberland Plain Woodland community and prevent further impacts. Further retention and rehabilitation of the CEEC within planned open space areas will be undertaken where possible, as well as the retention of individual trees in Lots and Parks.
iii. 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.	The TEC occurs in three conditions within the development footprint: • Landscape Plantings: ○ Composition condition score: 20 ○ Structure condition score: 3.1 ○ Function condition score: 29.9 ○ Presence of hollow-bearing trees: No ○ VI score: 12.4 • Low: ○ Composition condition score: 20 ○ Structure condition score: 20.2 ○ Function condition score: 46.1 ○ Presence of hollow-bearing trees: Yes ○ VI score: 26.5 • Moderate: ○ Composition condition score: 49.5 ○ Structure condition score: 81.5 ○ Function condition score: 79.5 ○ Presence of hollow-bearing trees: Yes ○ VI score: 68.4 The proposed works will result in the removal of 4.18 ha of the CEEC from the development footprint, which includes 1.96 ha in Landscape Plantings, 0.27 ha in Low condition, and 1.95 ha of Moderate condition. This vegetation comprises a combination of small, isolated patches of the CEEC, and approximately 2/3 of a larger patch of vegetation in the southern portion of the subject land adjacent to Elizabeth Macarthur Creek. Further retention and rehabilitation of the CEEC within planned open space areas will be undertaken where possible, as well as the retention of individual trees in Lots and Parks.

Based on the above assessment, the project will not have a significant or substantial impact upon the geographic extent of the CEEC, given impacts will occur to approximately 0.02% of the community (4.18 ha of the 22,774 ha estimated extent). Nor will the project contribute in a material way to further environmental degradation or the disruption of biotic processes, given the already highly fragmented condition the CEEC that occurs in within 500 m of the development footprint and other negative pressures already acting on the CEEC in the locality, and more broadly.