Kingswood Public School - Flora and Fauna Assessment

Department of Education NSW

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Template 2.8.1

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Abbreviations

Abbreviation	Description
BAM	Biodiversity Assessment Method 2020
BC Act	NSW *Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offsets Scheme
CEEC	Critically endangered ecological community
COLA	covered outdoor learning area
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment, and Water
DoE	NSW Department of Education
DP	Deposited Plan
EEC	Endangered ecological community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EP&A Regulation	NSW *Environmental Planning and Assessment Regulations 2021*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FFA	Flora and Fauna Assessment
FM Act	NSW *Fisheries Management Act 1994*
GIS	Geographic Information Systems
KTP	Key Threatening Process
LGA	Local Government Area
MNES	Matters of National Environmental Significance
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment, and Water
NSW SC	NSW Scientific Committee
PCT	Plant Type Community
Penrith LEP	*Penrith Local Environmental Plan 2010*
PMST	Protected Matters Search Tool
REF	Review of Environmental Factors
SEPP	State Environmental Planning Policy
SEPP TI	*State Environmental Planning Policy (Transport and Infrastructure) 2021*
SIS	Species Impact Statement
SPRAT	Species Profile and Threats
SVTM	State Vegetation Type Mapping

Abbreviation	Description
TEC	Threatened ecological community
WM Act	NSW *Water Management Act 2000*
WoNS	Weeds of National Significance

Executive Summary

Eco Logical Australia Pty Ltd (ELA) was engaged by RP Infrastructure on behalf of NSW Department of Education (DoE) to prepare a Flora and Fauna Assessment (FFA) report for the upgrades to Kingswood Public School at Second Avenue, Kingswood NSW (the 'study area'). The proposed activity for upgrades to Kingswood Public School includes construction of one new classroom building, construction of a covered walkway and removal of existing portable classroom buildings. This ecological assessment will be used to support a Review of Environmental Factors (REF) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

This report has assessed the potential impacts of the proposed works on flora and fauna species listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Two preliminary reports had previously been prepared for DoE, a Biodiversity Preliminary Review Report (Water Technology 2024) and a Preliminary Arboricultural Report (Laurence and Co. 2024). Both have been utilised in this FFA report to determine biodiversity values present within the study area. No field survey was conducted by ELA.

ELA undertook a database and literature review to determine the extent of native vegetation and to inform an assessment of potential impacts to threatened species, their habitat and ecological communities. Native remnant vegetation was identified in the study area in the form of Plant Community Type (PCT) 3320 – Cumberland Shale Plains Woodland. Taking a conservative approach using data from the background database review and preliminary reports, both BC Act and EPBC Act threatened ecological communities (TECs) have been mapped as occurring within the study area. This included *Cumberland Plain Woodland in the Sydney Basin Bioregion*, which is listed as a critically endangered ecological community (CEEC) under the BC Act, and *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*, which is listed as a CEEC under the EPBC Act.

No threatened fauna or flora have previously been recorded occurring in the study area. Potential habitat for threatened fauna species *Meridolum corneovirens* (Cumberland Plain Land Snail) was previously recorded within the Biodiversity Preliminary Review Report (Water Technology 2024) in two areas of the study area. Neither of these areas are proposed to be affected by the proposed activity. Furthermore, it is unlikely habitat that habitat for this species occurs within the study area. Firstly, the study area appears to be regularly maintained through mowing (Water Technology 2024), there are no BioNet records of Cumberland Plain Land Snail within the study area and low number of records within a 5 km radius of the study area. Finally, there is a lack of connectivity between the vegetation within the study area and previous BioNet records, due to urban development.

The impact assessment determined that the proposed activity will involve the removal of 0.02 ha of planted native vegetation (four *Callistemon viminalis,* one *Eucalyptus microcorys* and two *Casuarina cunninghamiana*) within the study area. There will also be direct impacts to 0.11 ha of Exotic Grass.

The potential impact of the proposal to threatened species and communities listed under the BC Act and EPBC Act was assessed by undertaking an assessment of likelihood of occurrence for threatened ecological communities and threatened and migratory species identified from the database search (Appendix A). No Tests of Significance under the BC Act and Assessments of Significance under the EPBC

Act were required for threatened species or TECs due to the findings of the Likelihood of Occurrence Assessment. The proposed activity would not impact on any TECs mapped within the study area. PCT 3320 (one *Corymbia maculata*) located immediately adjacent to the proposed structure is to be retained along with the other patches of PCT 3320 within the study area. Therefore, a Species Impact Statement (SIS) or Biodiversity Assessment Development Report (BDAR) under the BC Act, or a referral under the EPBC Act, is not required.

Mitigation measures and recommendations have been provided to prevent indirect impacts to threatened species and ecological communities adjacent to the study area (Section 6).

1. Introduction

1.1. Purpose of this report

This Flora and Fauna Assessment (FFA) report has been prepared to accompany a Review of Environmental Factors (REF) for the Department of Education (DoE) for upgrades to Kingswood Public School (the activity) under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

This document has been prepared in accordance with the Guidelines for Division 5.1 assessments (the Guidelines) by the Department of Planning, Housing and Infrastructure (DPHI).

This report examines and takes into account the relevant environmental factors in the Guidelines and *Environmental Planning and Assessment Regulations 2021* (EP&A Regulation) under Section 170, Section 171 and Section 171A of the EP&A Regulation.

The FFA will be used to support the completion of a Review of Environmental Factors (REF) pursuant to Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) and the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP TI).

The purpose of this FFA is to assess the potential impacts of the proposed work, on threatened species and ecological communities listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

1.2. Proposed activity description

The proposed activity for upgrades to Kingswood Public School includes:

- One new single storey classroom building comprising eight general learning spaces, two learning commons areas, two multi-purpose spaces and a veranda along the eastern side of the building;
- The construction of a covered walkway and additional lighting that will provide a connection between the proposed classroom building and an existing covered outdoor learning area (COLA) to the north east of the proposed building;
- Removal of existing portable classroom buildings containing ten classrooms;
- An easement (5.5 m x 2.75 m wide) for installation of new in-ground consumer mains running from the new substation to a new main switchboard (MSB) which is to be installed within an external enclosure outside along the northern side of one of the budlings located in the northern portion of the study area.

Proposed activities are portrayed in Figure 2.

1.3. Site description

The project site is located at 46-54 Second Avenue, Kingswood and is legally described as Lot 172 in Deposited Plan (DP) 839785. Kingswood Public School is located on the southern side of Second Avenue.

Figure 1 provides aerial mapping of the site.

Kingswood Public School (from here on referred to as the 'study area') is approximately 4.2 ha and is comprised by Lot 172 DP839785. The study area is zoned as R3 – Medium Density Residential under the *Penrith Local Environmental Plan 2010* (Penrith LEP). Surrounding land zoning includes R3 – Medium Density Residential to the north-east, south and west, E1 – Local Centre to the north-west, SP2 – Educational Establishment to the east in the form of the University of Western Sydney Penrith Campus, RE1 – Public Recreation to the north and south-west, in the form of Chapman Gardens and Manning Street Reserve respectively. The closest major town is Penrith, approximately 3 kms to the north-west.

1.4. Background

A preliminary report detailing the biodiversity constraints for the study area (Water Technology 2024) and a preliminary arboricultural report (Laurence & Co. 2024) were previously developed for DoE. Following these reports, DoE have decided to proceed down a Part 5 pathway under the EP&A Act. Under a Part 5 pathway, a REF is to be prepared. Part of the REF includes undertaking a FFA for the proposed activity. The FFA has been prepared by ELA utilising the results previously detailed in the biodiversity constraints report (Water Technology 2024), the preliminary arboricultural report (Laurence & Co. 2024), as well as that data obtained from a background literature review (see Section 3.1).

1.5. Key definitions

The following key terms and definitions are used in this FFA:

- Proposed activity – works as described above in Section 1.2
- Study area – the entirety of Kingswood Public School (Lot 172 DP839785).
- Preliminary reports – refers to the Biodiversity Preliminary Review Report prepared by Water Technology (2024) for DoE and the Preliminary Arboricultural Report prepared by Laurence & Co. (2024) for DoE.

Figure 1: Kingswood Public School the study area

Figure 2: Proposed works

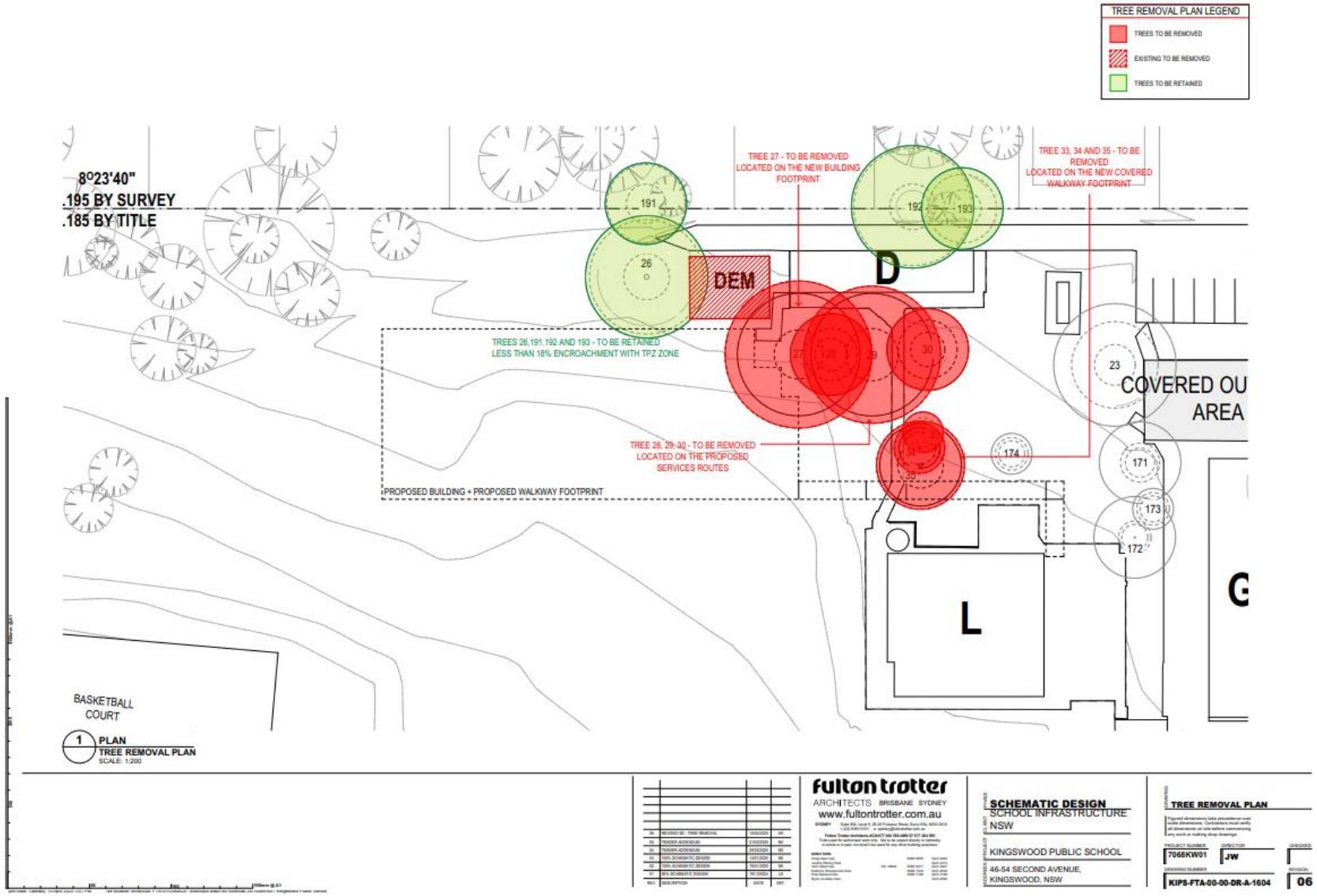

Figure 3: Tree removal plan

2. Legislation

Table 1: Legislation relevant to the proposed works

Legislation	Relevance to the project	Report section
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	The Commonwealth EPBC Act aims to protect Matters of National Environmental Significance (MNES), including vegetation communities and species listed under the EPBC Act. If an activity is likely to have a significant impact on MNES, it is likely to be considered a 'Controlled Action' by the Commonwealth and requires assessment and approval by the Commonwealth to proceed. One MNES was located within the study area: • *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* An assessment of significance was performed to determine whether the proposed works would be considered a 'Controlled Action'. Assessment concluded that the proposed activity was unlikely to result in a significant impact to the above MNES entity. As such, a referral to the Commonwealth is unlikely to be required as a part of the proposed works	Section 5.4
Environmental Planning and Assessment Act 1979 (EP&A Act)	The EP&A Act is the principal planning legislation for NSW, providing a framework for the overall environmental planning and assessment of development proposals. The EP&A Act places a duty on the determining authority to adequately address a range of environmental matters including maintenance of biodiversity and the likely impact to threatened species, populations, or ecological communities (under the BC Act– refer below). The project is being assessed under Part 5 of the EP& A Act.	Entire report
Biodiversity Conservation Act 2016 (BC Act)	Impacts to threatened species and threatened ecological communities listed under the BC Act are required to be assessed in accordance with Section 7.3 of the BC Act, known as 'tests of significance'. For assessments under Part 5 of the EP&A Act, the Biodiversity Offsets Scheme threshold does not apply, as specified in section 7.2 (2). Declared areas of 'outstanding biodiversity value' under section 7.2(1c) must still be considered. For a Part 5 assessment, if the conclusion of the test of significance is that there is potential for a significant impact on a threatened species or ecological community, then the proponent has the option of preparing a Species Impact Statement (SIS), or a Biodiversity Development Assessment Report (BDAR). The proposed works is unlikely to result in a significant impact upon threatened species listed under the BC Act and therefore a SIS or BDAR is not required. The study area is not located within declared areas of outstanding biodiversity value. No Tests of Significance under the BC Act were required for threatened species or TECs due to the findings of the Likelihood of Occurrence Assessment, after considering both the desktop review and the field survey results.	Entire report
Fisheries Management Act 1994 (FM Act)	The FM Act governs the management of fish and their habitat in NSW. The FM Act regulates the provision of permits required in relation to the harm of protected marine vegetation (seagrass, macroalgae, mangroves and saltmarsh), dredging, reclamation or obstruction of fish passage on or adjacent to Key Fish Habitat. This includes direct or indirect impacts, whether temporary or permanent. The study area does not contain areas mapped as Key Fish Habitat. Werrington Creek occurs approximately 400 m to the east of the study area and is mapped as Key Fish Habitat. The proposed works do not involve harm to mangroves or other	N/A

Legislation	Relevance to the project	Report section
	protected marine vegetation, dredging, reclamation or blocking of fish passage and therefore a permit under the FM Act is not required.	
NSW Biosecurity Act 2015	Under the *Biosecurity Act 2015*, priority weeds have been identified for the Greater Sydney Region and assigned strategies to contain, remove or manage. Occupiers of land (this includes owners of land) have responsibility for taking appropriate action for priority weeds on the land they occupy. The study area contains weeds listed under the Biosecurity Act 2015.	Section 4.2.2 and Section 6
Water Management Act 2000 (WM Act)	The WM Act's main objective is to manage NSW water in a sustainable and integrated manner that will benefit current generations without compromising future generations' ability to meet their needs. The WM Act establishes an approval regime for activities within waterfront land, defined as the land 40 m from the highest bank of a river, lake, or estuary. The study area is not located on waterfront land. Furthermore, a, Controlled Activity Approval under the WM Act is not required for the activities under Part 5 of the EP&A Act.	N/A
State and local planning instruments		
State Environmental Planning Policy (Resilience and Hazards) 2021	This SEPP applies to land in the coastal zone. The study area is not located within an area to which this SEPP applies	N/A
State Environmental Planning Policy (Biodiversity and Conservation) 2021	This new SEPP came into effect on 1 March 2022 and consolidates the following SEPPS of relevance to the study area: • Chapter 2 - The Vegetation in Non-Rural Areas 2017 • Chapter 4 - Koala Habitat Protection 2021 • Chapter 6 - Water Catchments. The Biodiversity and Conservation SEPP aims to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, and to preserve the amenity of non-rural areas of the State through the preservation of trees and other vegetation. The City of Penrith Local Government Area (LGA) is listed as one of the LGAs to which this SEPP applies. However, the proposed works do not require consent as they are permitted without consent under SEPP TI, therefore Chapter 2 does not apply. The City of Penrith LGA is not listed as land to which Chapter 4 – Koala Habitat Protection 2021 applies. The study area is located within the Hawkesbury-Nepean Catchment in accordance with this SEPP. This SEPP applies to development which requires development consent, as the proposed works do not require consent as they are permitted without consent under SEPP TI Chapter 6 does not apply.	N/A
Penrith Local Environmental Plan 2010 (Penrith LEP)	The study area is located on land zoned as R3 – Medium Density Residential. The objective of this land zoning is: • To provide for the housing needs of the community within a medium density residential environment. • To provide a variety of housing types within a medium density residential environment. • To enable other land uses that provide facilities or services to meet the day to day needs of residents.	Entire Report

Legislation	Relevance to the project	Report section
	• To provide for a concentration of housing with access to services and facilities. • To enhance the essential character and identity of established residential areas. • To ensure that a high level of residential amenity is achieved and maintained. • To ensure that development reflects the desired future character and dwelling densities of the area. The study area is not located on land mapped for urban release or that is identified as “Natural resources sensitive land” under the LEP.	

3. Methodology

3.1. Literature review and database search

A review of readily available databases pertaining to the ecology and environmental features of the entire extent of the study area and surrounding area (within a 5 km radius), was conducted to identify records of threatened species, populations and communities and their potential habitat.

Databases and vegetation mapping that were reviewed included:

- BioNet (NSW Atlas of Wildlife) database search (5 km) for threatened species, populations and ecological communities listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) (NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW) 2024a)
- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters Search Tool (PMST) for threatened and migratory species, populations and ecological communities listed under the Commonwealth EPBC Act (Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) 2024a)
- NSW Threatened Species Profile Database (NSW DCCEEW 2024b).
- Previous vegetation mapping under the State Vegetation Type Map (SVTM) (NSW DCCEEW 2024c)
- Plant Community Type (PCT) information under BioNet Vegetation Classification (NSW DCCEEW 2024d)
- National Flying-fox monitoring viewer for current known important Flying-fox camps (DCCEEW 2024b)
- Australian Government Species Profile and Threats (SPRAT) Database (DCCEEW 2024c)
- Relevant Geographic Information System (GIS) datasets including soils, geology and drainage (NSW DCCEEW 2024e).
- Review of relevant planning instruments, documentation, and information relating to biodiversity values (NSW DCCEEW 2024f) and potential threatened species habitat.
- Aerial photography (including Google Earth and Historical Imagery) of the study area and surrounds were also used to investigate the extent of vegetation cover and landscape features.
- Environmental Services Biodiversity Preliminary Review Report, prepared by Water Technology (2024a)
- Preliminary Arborist Assessment report, prepared by Water Technology (2024b)

Species searches from both the NSW BioNet Wildlife Atlas and EPBC Protected Matters search were combined to produce a list of threatened species, populations and communities that may occur within the study area. This list was also supplemented or amended based on local ecological knowledge of the area, including known species occurrences. A likelihood of occurrence table for threatened flora, fauna and ecological communities is given in Appendix A.

3.2. Limitations

Field survey was not completed by ELA ecologists and assessment has been based on results presented in the preliminary reports. Limited mapping of validated vegetation was provided in the preliminary report by Water Technology (2024), and only the northern half of the study area was surveyed by the

arborist to prepare the preliminary arboricultural report (Laurence & Co 2024). Validated vegetation mapping in this FFA has been presented based on the text and mapping provided in the preliminary reports, taking a conservative approach.

4. Results

4.1. Data audit and literature review

4.1.1. Soils, topography and hydrology

The study area is entirely located on Luddenham soil landscapes. Luddenham soil landscapes are characterised by undulating to rolling low hills on Wianamatta Group shale (NSW DCCEEW 2024e). Vegetation associated with Luddenham soil landscapes includes extensively cleared tall, open forests (NSW DCCEEW 2024e). The study area is located on gently sloping terrain from the south-east to north-west of the study area (Water Technology 2024).

There are no waterbodies mapped within the study area (Figure 1). Closest waterbody is an unnamed 1st order Strahler stream approximately 60 m away.

4.1.2. Vegetation mapping

Previous vegetation mapping under the State Vegetation Type Map (SVTM) (NSW DCCEEW 2024a) was reviewed for vegetation occurring within the study area and surrounding land (Figure 4). The SVTM has mapped the following Plant Community Types (PCTs) within the study area:

- PCT 3320 – Cumberland Shale Plains Woodland

PCT 3320 corresponds to both BC Act listed and EPBC Act listed threatened ecological communities (TEC). PCT 3320 may correspond to the following BC Act listed TECs:

- *Cumberland Plain Woodland in the Sydney Basin Bioregion* – listed as a critically endangered ecological community (CEEC)
- *Shale Gravel Transition Forest in the Sydney Basin Bioregion* – listed as an endangered ecological community (EEC)

It also corresponds with the EPBC Act listed TEC *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*, which is listed as a CEEC.

More details are provided in Section 4.2.1.

4.1.3. Threatened species

The search for threatened species using the PMST and BioNet (within a 5 km buffer around the study area) and the review of literature resulted in a list of 26 threatened flora species and 60 threatened or migratory fauna species, which are shown in Appendix A.

It should be noted that the result of the PMST, which has been included in Appendix A, is only a list of species based on habitat modelling. Therefore, not all species listed in Appendix A are shown on the maps in this report. BioNet database records for the study area of threatened flora and fauna are shown in Figure 5.

There are no threatened flora or fauna species BioNet records located within the study area. One record of *Pteropus poliocephalus* (Grey-headed Flying-fox) occurred adjacent to the study area. This species is highly mobile and will regularly forage on native and planted vegetation in urban environments as it

moves across the landscape (DCCEEW 2024c). The closest Grey-headed Flying-fox camp to the study area is located approximately 5 km to the north-west in Emu Plains.

Additionally, due to the presence of intact native vegetation to the east of the study area, there is a potential that highly mobile threatened fauna species such as birds and bats may utilise the study area on occasion for foraging.

Figure 4: State Vegetation Type Mapping (NSW DCCEEW 2024c)

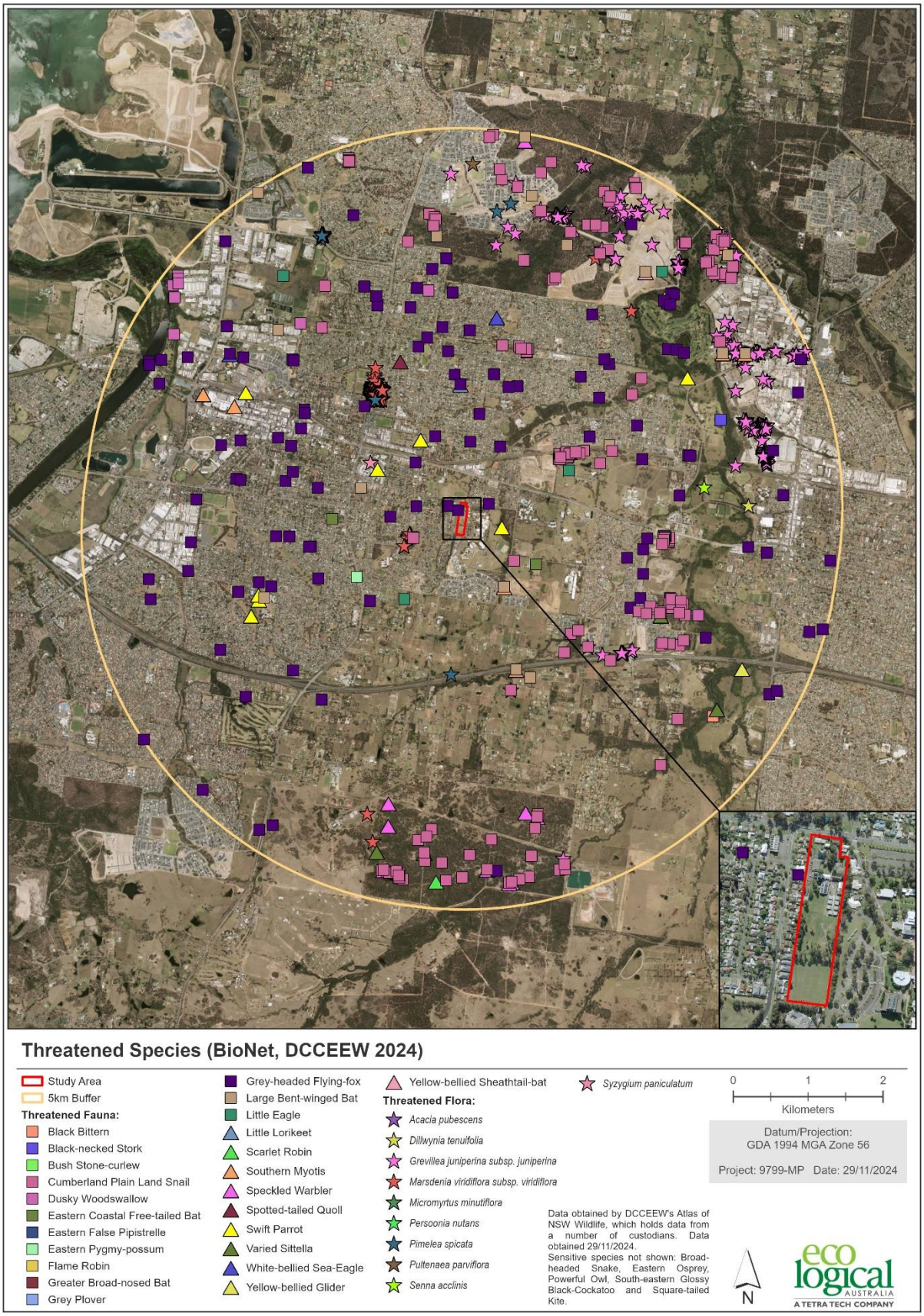

Figure 5: BioNet threatened flora and fauna species records within a 5 km radius of the study area (NSW DCCEEW 2024a)

4.2. Survey results

Survey results have been obtained from the two preliminary reports. No field surveys were conducted by ELA ecologists. A conservative approach has been taken when defining the vegetation communities present due to absence of information provided in the preliminary reports.

4.2.1. Vegetation communities

The preliminary report recorded the vegetation within the study area as being consistent with the vegetation communities previously mapped in the SVTM (NSW DCCEEW 2024c).

One PCT was mapped as occurring within the study area, PCT 3320 – Cumberland Shale Plains Woodland. This vegetation occurred as canopy species with limited presence of mid-storey or ground cover species for the majority of the study area, which was regularly maintained through mowing. Canopy species associated with this identified in the preliminary reports included *Eucalyptus moluccana* (Grey Box), *E. fibrosa* subsp. *fibrosa* (Red Ironbark) and *Corymbia maculata* (Spotted Gum). Where mid-storey and ground cover species were present, these featured native species associated with PCT 3320, including *Bursaria spinosa* (Blackthorn), *Dodonaea viscosa* (Sticky Hopbush), *Indigofera australis* (Australian Indigo), *Hardenbergia violacea*, *Themeda triandra* (Kangaroo Grass) and *Dichondra repens* (Kidney Weed) (Water Technology 2024a 2024b).

Areas of vegetation within the study area not mapped as this PCT are assumed to be planted exotic vegetation. Exotic species recorded within the study area included *Jacaranda mimosifolia* (Jacaranda), *Olea europaea* subsp. *cuspidata* (African Olive), *Buxus microphylla* var. *japonica* (Japanese Box) and *Wisteria sinensis* (Chinese Wisteria). Common exotic lawn species were also recorded, including *Pennisetum clandestinum* (Kikuyu), *Hypochaeris radicata* (Cat's Ear), *Ehrharta calycina* (Veldt Grass), *Sonchus oleraceus* (Common Sow Thistle) and *Soliva sessilis* (Bindi).

4.2.1.1. Threatened ecological communities

PCT 3320 is associated with BC Act and EPBC Act listed TECs. The Biodiversity Preliminary Review Report (Water Technology 2024) did not assign the vegetation present within the study area to a TEC. A conservative approach has been taken for this report and assigned vegetation to TECs based on the preliminary reports and information obtained from the literature review.

Vegetation within the study area has been assigned to the BC Act TEC *Cumberland Plain Woodland in the Sydney Basin Bioregion*, which is listed as a critically endangered ecological community (Figure 7). This is based on the soil mapping, the landscape topography and assemblage of species described in the preliminary reports. All of PCT 3320 identified within the study area meets the criteria for the BC Act listed TEC.

PCT 3320 is also associated with EPBC Act listed TEC *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*. EPBC Act listed TEC have certain conditional requirements that need to be met in order for vegetation to be considered part of the community (Figure 8). The vegetation within the study area meets the patch size criteria for this TEC. As the preliminary reports did not detail the canopy cover or native species ground cover percentages, a conservative approach has been taken and assumed that vegetation within the study area has met these criteria. Therefore, vegetation within the study area meets the criteria to be listed as this TEC (Figure 7).

Figure 6: Validated vegetation based on background literature review and the preliminary reports

Figure 7: TECs identified in the study area.

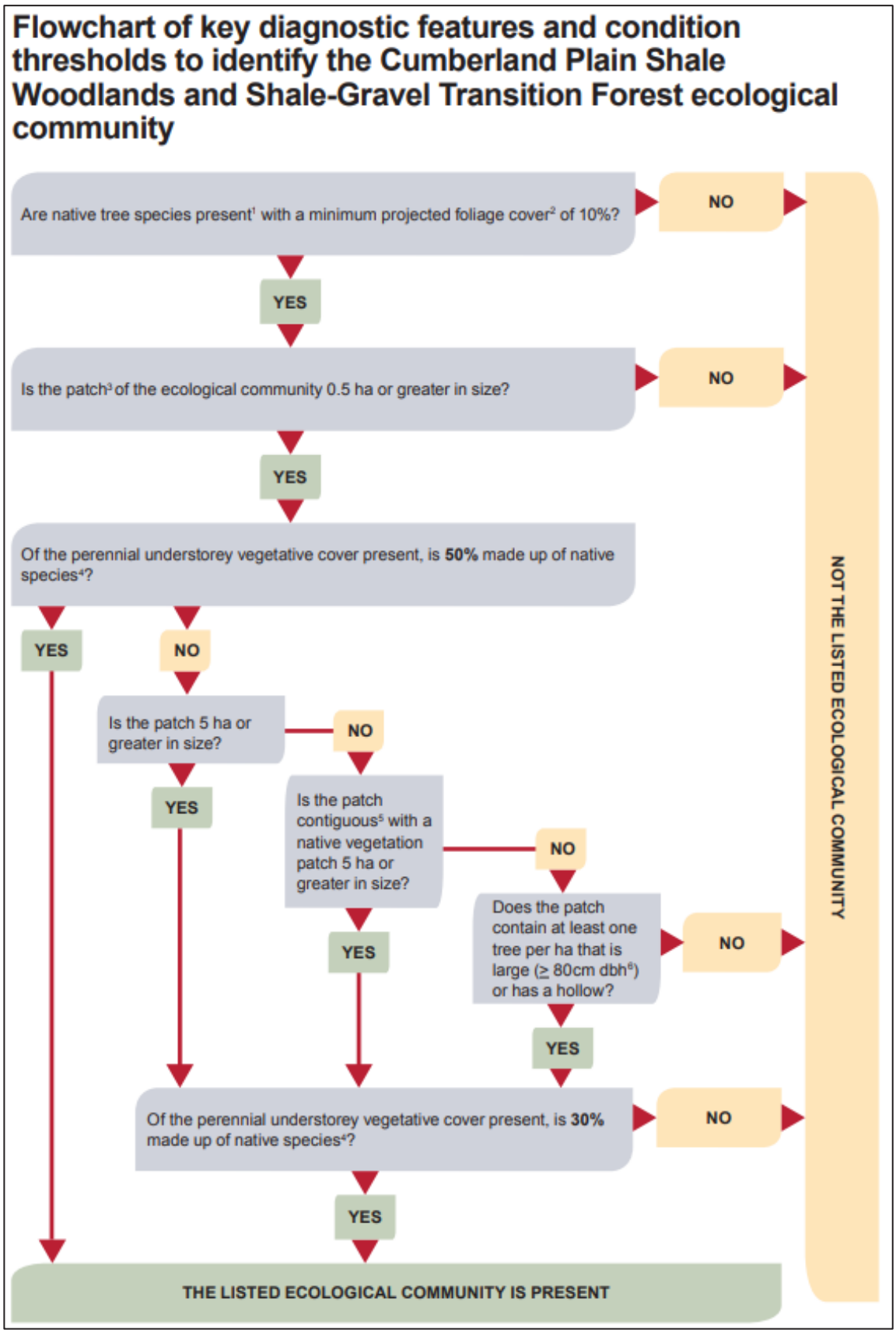

Figure 8: Condition thresholds to meet EPBC Act listed *Cumberland Plain Shale Woodland and Shale-Gravel Transitional Forest* TEC (DEWHA 2010).

4.2.2. Flora species

The preliminary reports provide a list of native and exotic species recorded within the study area. No threatened flora species were recorded within the study area in the preliminary reports.

Of the exotic species identified in the preliminary reports, *Olea europaea* subsp. *cuspidata* is listed as a Priority weed for the Greater Sydney Region under the NSW *Biosecurity Act 2015*. Mitigation measures to prevent spread of the plant from the study area is required under this Act.

4.2.3. Fauna species and their habitat

The Biodiversity Preliminary Review Report (Water Technology 2024) provided a list of fauna species observed during the field survey. No threatened fauna species were identified during the field survey.

Potential habitat was identified for *Meridolum corneovirens* (Cumberland Plain Land Snail) as occurring within the study area in the Biodiversity Preliminary Review Report (Water Technology 2024). Survey of this habitat was undertaken. However, the species was not recorded at the time of the survey. Planted native vegetation proposed for removal includes four *Callistemon viminalis* (Weeping bottlebrush), one *Eucalyptus microcorys* (Tallowwood) and two *Casuarina cumminghamiana* (Swamp She-oak).

The ground cover around this tree appears to be well-maintained through regular mowing (Water Technology 2024). Additionally, as there are no records within the study area, low number of records in vegetation adjacent to the study area, and the lack of connectivity to vegetation within the study area due to urban development, it is considered unlikely that Cumberland Plain Land Snail is present within the study area and will be affected by the proposed activity.

Native canopy species may also provide foraging habitat for highly mobile species such as *Pteropus poliocephalus* (Grey-headed Flying-fox). Due to the limited amount of potential foraging vegetation present, these trees may only be used on occasion by highly mobile threatened species as they move across the landscape. No other potential threatened fauna habitat was identified within the study area.

5. Impact assessment

5.1. Introduction

The potential impact of the proposal to threatened species and communities listed under the BC Act and EPBC Act was assessed by undertaking an assessment of likelihood of occurrence for threatened ecological communities and threatened and migratory species identified from the database search (Appendix A).

No Tests of Significance under the BC Act and Assessments of Significance under the EPBC Act were required for threatened species or TECs due to the findings of the Likelihood of Occurrence Assessment, after considering both the desktop review and the field survey results.

While PCT 3320 consistent with the critically endangered ecological communities *Cumberland Plain Woodland in the Sydney Basin Bioregion* listed under the State BC Act and *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* listed under the Commonwealth EPBC Act have been mapped within the study area, the proposed activity would not impact on these communities.

Highly mobile threatened species which are wide-ranging and dispersive may still utilise the study area on occasion for foraging. The proposed activity would not affect any habitat that is important to the survival of these species and therefore no BC Act Test of Significance or EPBC Act Significant Impact Criteria were applied for threatened flora or fauna species.

5.2. Direct impacts

Direct impacts during the construction phase and long-term impacts post construction have been considered for the impact assessment. The proposed substation works, upgrading from the existing pole substation to an on-site kiosk substation, will have a small impact on planted native and exotic vegetation (manicured hedges).

A summary of the potential impacts has been provided in Table 2.

Table 2: Summary of potential impacts to vegetation communities in study area

Vegetation community	Total area in study area (ha)	Direct impact (ha)
PCT 3320 Cumberland Shale Plains Woodland	0.45	0.00
Planted native/exotic vegetation	0.28	0.02
Exotic groundcover vegetation	2.50	0.11
TOTAL	**3.23**	**0.13**

Direct impacts are those impacts that directly affect habitat and individuals. Direct impacts considered for this assessment are vegetation removal. The proposed activity is likely to result in the following direct impacts:

- direct - removal of native vegetation

5.2.1. Removal of native vegetation

Based on the final landscape design (dated 20 January 2025) the proposed activity will result in the removal of approximately 0.02 ha of planted native vegetation, which includes four *Callistemon viminalis* (Weeping bottlebrush), one *Eucalyptus microcrys* and two *Casuarina cunninghamiana* (Swamp She-oak). This consists of approximately 0.02 ha of native vegetation to be removed,. The proposed activity will not impact (directly or indirectly) PCT 3320, which conforms to the BC Act listed TEC *Cumberland Plain Woodland in the Sydney Basin Bioregion* and the EPBC Act listed TEC *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*. PCT 3320 (one *Corymbia maculata*) immediately adjacent to the proposed structure is to be retained, along with the other patches of PCT 3320 within the study area.

5.3. Biodiversity Conservation Act 2016

Impacts to threatened species and threatened ecological communities listed under the BC Act are required to be assessed in accordance with Section 7.3 of the BC Act, known as 'Test of Significance' (also known as a 5-part test).

For assessments under Part 5 of the EP&A Act the biodiversity offsets scheme threshold is not required to be applied, as specified in section 7.2 (2). Declared areas of 'outstanding biodiversity value' under section 7.2 (1c) must still be considered.

For a Part 5 assessment, if the conclusion of the tests of significance is that there is potential for a significant impact on a threatened species or ecological community, then the proponent has the option of preparing a Species Impact Statement (SIS), or a Biodiversity Development Assessment Report (BDAR).

The test of significance is used to determine if the activity is likely to have a significant impact on any threatened species, populations or ecological communities. If a significant impact is indicated by the test of significance, and the proponent decides to prepare a BDAR, then the proposal would trigger the Biodiversity Offsets Scheme (BOS) and a Biodiversity Assessment Method 2020 (BAM) assessment is required.

No Tests of Significance under the BC Act were required for threatened species or TECs due to the findings of the Likelihood of Occurrence Assessment, after considering both the desktop review and the field survey results.

5.3.1. Key Threatening Processes

Key Threatening Processes (KTPs) listed under the BC Act or EPBC Act are relevant to the proposed works, including clearing of native vegetation under the BC Act and Land clearance under the EPBC Act.

5.4. EPBC Act – Assessment of Significance

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where 'Matters of National Environmental Significance' (MNES) may be affected. Under the Act any action which "has, will have, or is likely to have a significant impact on a Matter of National

Environmental Significance" is defined as a "controlled action", and requires approval from the Commonwealth DCCEEW which is responsible for administering the EPBC Act.

No Assessments of Significance under the EPBC Act were required for threatened species or TECs due to the findings of the Likelihood of Occurrence Assessment, after considering both the desktop review and the field survey results.

6. Mitigation measures

To prevent direct impacts from the proposal on adjacent vegetation communities and habitat for threatened species, the following general mitigation measures are recommended, and additional specific controls are provided in Table 3:

- Delineated No Go Zones are established for remnant vegetation meeting conditions for BC Act listed TEC *Cumberland Plain Woodland in the Sydney Basin Bioregion* to prevent inadvertent impacts to these areas during construction phase.
- Tree protection fencing is established around any proposed trees to be retained within the vicinity of the proposed buildings to be constructed and / or removed.

Table 3: Recommendations for mitigation measures

Mitigation number / name	When is mitigation measure to be complied with	Mitigation measure	Reason for mitigation measure
1. Native vegetation	Before and during construction phase.	• Pre-works briefings are to be undertaken by staff advising contractors or workers of sensitive areas and the relevant safeguards for each. • The extent of works must be clearly pegged or marked out by a surveyor prior to vegetation removal. • No-Go zones established and clearly delineated for remnant vegetation meeting the criteria for *Cumberland Plain Woodland in the Sydney Basin Bioregion* TEC. • Tree protection fencing is established around any proposed trees to be retained within the vicinity of the proposed buildings to be constructed and / or removed.	• Prevent accidental impacts to native vegetation proposed for retention / outside of development footprint.
2. Potential threatened fauna habitat	Before and during construction phase.	• Pre-works briefings are to be undertaken by staff advising contractors or workers of sensitive areas and the relevant safeguards for each. • The extent of works must be clearly pegged or marked out by a surveyor prior to vegetation removal. • No-Go zones established and clearly delineated for potential Cumberland Plain Land Snail habitat.	• Prevent accidental impacts, such as trampling, to threatened species.
3. Sediments and erosion control	Before and during construction phase.	• Avoid conducting works after or before any forecasted significant rainfall. • Soil and erosion control measures such as sediment fencing may be required prior to on-ground works. These are to be inspected regularly (weekly), and more frequently during rain periods to ensure structures are in proper working order.	• Prevent potential indirect impacts to retained vegetation or potential threatened species habitat within the study area caused by run-off.
4. Spread of weeds and disease	During construction phase, particularly during the movement of machinery to and from the study area.	• Priority weeds *Olea europaea* subsp. *cuspidata* listed in Section 4.2.2 should be managed using best management practices (including appropriate controls to prevent impacts to threatened species) to prevent transfer to other part or off of the study area. • The use of chemical should be limited due to the indirect impacts to threatened fauna and native vegetation.	• Requirement under the NSW *Biosecurity Act 2015*. • Prevent further spread of weeds.

7. Conclusion

Eco Logical Australia was commissioned by DoE c/o RP Infrastructure to prepare a Flora and Fauna Assessment (FFA) report for the proposed upgrades to Kingswood Public School. This assessment utilised preliminary reports prepared for DoE to highlight potential constraints within the study area.

One Plant Type Communities (PCTs) was recorded in the preliminary report, PCT 3320 – Cumberland Shale Plains Woodland. Taking a conservative approach using information obtained from a background literature and the preliminary reports, areas mapped as this PCT within the subject land meet the criteria for the BC Act listed TEC *Cumberland Plain Woodland in the Sydney Basin Bioregion* and the EPBC Act listed TEC *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*.

The impact assessment determined that the proposed activity would involve the removal of 0.02 ha of planted native vegetation (four *Callistemon viminalis,* one *Eucalyptus microcorys* and two *Casuarina cunninghamiana*) within the study area. The works will result in 0.02 ha of impact to native vegetation. There will also be direct impacts to 0.11 ha of Exotic Grass.

The potential impact of the proposal to threatened species and communities listed under the BC Act and EPBC Act was assessed by undertaking an assessment of likelihood of occurrence for threatened ecological communities and threatened and migratory species identified from the database search.

No Tests of Significance under the BC Act and Assessments of Significance under the EPBC Act were required for threatened species or TECs due to the findings of the Likelihood of Occurrence Assessment. Therefore, the proposed activity is unlikely to result in a significant impact to any threatened entities.

The proposed activity would not impact on any TECs mapped within the study area. PCT 3320 (one *Corymbia maculata*) located immediately adjacent to the proposed structure is to be retained along with the other patches of PCT 3320 within the study area. Therefore, a Species Impact Statement (SIS) or Biodiversity Assessment Development Report (BDAR) under the BC Act, or a referral under the EPBC Act, is not required.

Mitigation measures and recommendations have been provided to prevent indirect impacts to threatened species and ecological communities adjacent to the study area

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Appendix A Likelihood of occurrence

The table below provides the collated results from the 5 km database searches (buffered around the study site) of the NSW Wildlife Atlas and the EPBC Protected Matters Search Tool. An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database searches. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat and features of the proposal site as presented within the results of the preliminary reports, and professional judgement. The terms for likelihood of occurrence are defined below:

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

The likelihood of occurrence was only one factor among other factors, which was used to determine whether to apply the Assessment of Significance' (5-part test) and/or EPBC Significant Impact Criteria assessments to threatened species, populations, communities or migratory species.

Table 4: Likelihood of occurrence for ecological communities

BC Act name	BC Act status	EPBC Act name	EPBC Act status	Distribution and habitat	Likelihood of occurrence	Impact assessment required
Agnes Banks woodland in the Sydney Basin Bioregion	E	*Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion*	E	Dominated by *Eucalyptus parramattensis* subsp. *parramattensis, Angophora bakeri* and *E. sclerophylla*. A small tree stratum of *Melaleuca decora* is sometimes present, generally in areas with poorer drainage. It has a well-developed shrub stratum consisting of sclerophyllous species such as *Banksia spinulosa* var. *spinulosa, Melaleuca nodosa, Hakea sericea and H. dactyloides* (multi-stemmed form). The ground stratum consists of a diverse range of forbs *including Themeda australis, Entolasia stricta, Cyathochaeta diandra, Dianella revoluta* subsp. *revoluta, Stylidium graminifolium, Platysace ericoides, Laxmannia gracilis* and *Aristida warburgii*. Occurs within the local government areas of Bankstown, Blacktown, Campbelltown, Hawkesbury, Liverpool and Penrith. Mainly found in the Castlereagh area of the Cumberland Plain, with small patches occurring at Kemps Creek and Longneck Lagoon; also present around Holsworthy.	No	No, these communities were not recorded occurring within the study area.
Castlereagh Scribbly Gum Woodland in the Sydney Basin Bioregion	V					
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	*Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community*	E	This ecological community is associated with grey-black clay-loams and sandy loams, where the groundwater is saline or sub-saline, on waterlogged or periodically inundated flats, drainage lines, lake margins and estuarine fringes associated with coastal floodplains. Floodplains are level landform patterns on which there may be active erosion and aggradation by channelled and overbank stream flow with an average recurrence interval of 100 years or less. Swamp Oak Floodplain Forest generally occurs below 20 m (rarely above 10 m) elevation in the NSW North Coast, Sydney Basin and South East Corner	No	No, these communities were not recorded occurring within the study area.

BC Act name	BC Act status	EPBC Act name	EPBC Act status	Distribution and habitat	Likelihood of occurrence	Impact assessment required
				bioregions. The structure of the community may vary from open forests to low woodlands, scrubs or reedlands with scattered trees. Typically, these forests, woodlands, scrubs and reedlands form mosaics with other floodplain forest communities and treeless wetlands, and often they fringe treeless floodplain lagoons or wetlands with semi-permanent standing water.		
Cooks River/Castlereagh Ironbark Forest in the Sydney Basin Bioregion	E	*Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion*	CE	Ranges from open forest to low woodland, with a canopy dominated by *Eucalyptus fibrosa* (Broad-leaved Ironbark) and *Melaleuca decora* (Paperbark). The canopy may also include other eucalypts such as *E. longifolia* (Woollybut). The dense shrubby understorey consists of *Melaleuca nodosa* (Prickly-leaved Paperbark) and *Lissanthe strigosa* (Peach Heath), with a range of 'pea' flower shrubs, such as *Dillwynia tenuifolia, Pultenaea villosa* (Hairy Bush-pea) and *Daviesia ulicifolia* (Gorse Bitter Pea). The sparse ground layer contains a range of grasses and herbs. Occurs in western Sydney, with the most extensive stands occurring in the Castlereagh and Holsworthy areas. Smaller remnants occur in the Kemps Creek area and in the eastern section of the Cumberland Plain.	No	No, these communities were not recorded occurring within the study area.
Cumberland Plain Woodland in the Sydney Basin Bioregion	CE	*Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest*	CE	The Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest typically occurs on flat to undulating or hilly terrain, at elevations up to approximately 350 metres above sea level. Some	Yes	No, while both the BC Act listed TEC *Cumberland Plain Woodland in the Sydney*

BC Act name	BC Act status	EPBC Act name	EPBC Act status	Distribution and habitat	Likelihood of occurrence	Impact assessment required
Shale Gravel Transition Forest in the Sydney Basin Bioregion	E			occurrences may extend onto locally steep sites at slightly higher elevations. Predominantly associated with clay soils, that are derived from Wianamatta Shale geology.		*Basin Bioregion* and EPBC Act listed TEC *Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest* was recorded within the study area the proposed activity will not have any direct or indirect impacts on the TECs.
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	*River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales and eastern Victoria*	CE	Found on the river flats of the coastal floodplains. Known from parts of the Local Government Areas of Port Stephens, Maitland, Singleton, Cessnock, Lake Macquarie, Wyong, Gosford, Hawkesbury, Baulkham Hills, Blacktown, Parramatta, Penrith, Blue Mountains, Fairfield, Holroyd, Liverpool, Bankstown, Wollondilly, Camden, Campbelltown, Sutherland, Wollongong, Shellharbour, Kiama, Shoalhaven, Palerang, Eurobodalla and Bega Valley. Associated with silts, clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains.	No	No, these communities were not recorded occurring within the study area.
Shale Sandstone Transition Forest in the Sydney Basin Bioregion	CE	*Shale Sandstone Transition Forest of the Sydney Basin Bioregion*	CE	Occurs on areas transitional between the clay soils derived from Wianamatta Shale and the sandy soils derived from Hawkesbury Sandstone on the margins of the Cumberland Plain. Occurs or has occurred in the Bankstown, Baulkham Hills, Blue Mountains, Campbelltown, Hawkesbury, Liverpool, Parramatta, Penrith, and Wollondilly Local Government Areas (LGAs). The floristic composition of the community includes species otherwise characteristic of, or	No	No, these communities were not recorded occurring within the study area.

BC Act name	BC Act status	EPBC Act name	EPBC Act status	Distribution and habitat	Likelihood of occurrence	Impact assessment required
				occurring in, either sandstone or shale habitats. The structure of the community is forest or woodland.		
Moist Shale Woodland in the Sydney Basin Bioregion	E	*Western Sydney Dry Rainforest and Moist Woodland on Shale*	CE	Typically, a low closed forest, slightly more open in the moist woodland form, with emergent trees up to 25 m high and a lower tree layer. In sheltered gullies and on lower slopes the canopy layer is typically dominated by *Melaleuca styphelioides* (prickly-leaved paperbark). Other diagnostic tree species include *Acacia implexa* (hickory wattle), *Alectryon subcinereus* (native quince), *Brachychiton populneus* (kurrajong), *Corymbia maculata* (spotted gum), *Melicope micrococca* (white euodia) and *Streblus pendulinus* (whalebone tree). Generally, on upper slopes to undulating terrain, or at more disturbed sites, the ecological community exhibits its moist woodland form with the canopy dominated by *Eucalyptus moluccana, Eucalyptus tereticornis, Eucalyptus crebra* and/or *Corymbia maculata*. Characteristic shrub species include *Breynia oblongifolia* (false coffee bush), *Clerodendrum tomentosum* (hairy clerodendrum) and *Notelaea longifolia f. longifolia* (large mock-olive). Vines and other climber species are typically common. The ground layer is variable and generally sparse with a diverse mix of forbs, ferns and shade-tolerant grasses. Cumberland Plain Sub-region of the Sydney Basin Bioregion.	No	No, these communities were not recorded occurring within the study area.
Western Sydney Dry Rainforest in the Sydney Basin Bioregion	E					

BC ACT STATUS: CE = CRITICALLY ENDANGERED; E = ENDANGERED; EPBC ACT STATUS: CE = CRITICALLY ENDANGERED, E = ENDANGERED

Table 5: Likelihood of occurrence assessment for threatened fauna and flora species

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
Amphibians							
Heleioporus australiacus	Giant Burrowing Frog	V	V	Heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Spends more than 95% of its time in non-breeding habitat in areas up to 300 m from breeding sites. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Individual frogs occupy a series of burrow sites, some of which are used repeatedly. The home ranges of both sexes appear to be non-overlapping suggesting exclusivity of non-breeding habitat. Home ranges are approximately 0.04 ha in size. When breeding, frogs will call from open spaces, under vegetation or rocks or from within burrows in the creek bank. Males show strong territoriality at breeding sites. This species breeds mainly in autumn but has been recorded calling throughout the year. Breeding habitat of this species is generally soaks or pools within first or second order streams.	0	No	No, no potential breeding habitat recorded within study area. Study area does not meet conditions for non-breeding habitat. No local records.
Litoria aurea	Green and Golden Bell Frog	E1	V	recorded from ~ 50 scattered sites within its former range in NSW, from the north coast near Brunswick Heads, south along the coast to Victoria. Records exist west to Bathurst, Tumut and the ACT region. Marshes, dams and stream-sides, particularly those containing *Typha spp.* (bullrushes) or *Eleocharis spp.* (spikerushes). Some populations occur in highly disturbed areas.	0	No	No. No marshes, dams or streams recorded in the study area. No local records.
Aves							

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
Actitis hypoleucos	Common Sandpiper	-	M	Summer migrant. In NSW, widespread along coastline and occurs in many areas inland. Coastal wetlands and some inland wetlands, especially muddy margins, or rocky shores. Also, estuaries and deltas, lakes, pools, billabongs, reservoirs, dams and claypans, mangroves.	0	No	No, no preferred habitat recorded within the study area. No local records.
Anthochaera phrygia	Regent Honeyeater	CE	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions. Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of *Casuarina cunninghamiana* (River Oak).	0	Unlikely	No, limited foraging habitat recorded within the study area. No local records.
Aphelocephala leucopsis	Southern Whiteface	V	V	Inhabits drier open forests, woodlands and shrublands with an understorey of grasses or shrubs, where it often forages on the ground in small flocks. Breeds between July to October, with inland breeding time influenced by rainfall. Builds dome nest in hollow limbs or foliage as well as man-made infrastructure such as stumps, fence posts or in sheds.	0	Unlikely	No, limited potential habitat recorded within the study area. No local records.
Apus pacificus	Fork-tailed Swift	-	M	Non-breeding visitor to Australia, arriving in October and departing in April. Occur over riparian woodland, swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand-dunes.	0	Unlikely	No, the species may potentially forage aerially above the development footprint. However, the species spends the majority of its life in the air. No local records.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and groundcover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.	12	Unlikely	No, limited potential habitat recorded within the study area. The proposed activity is avoided the majority of this habitat, with a single *Corymbia maculata* proposed to be removed.
Botaurus poiciloptilus	Australasian Bittern	E1	E	Found over most of NSW except for the far north-west. Permanent freshwater wetlands with tall, dense vegetation, particularly *Typha spp.* (bullrushes) and *Eleocharis spp.* (spikerushes).	0	No	No, potential habitat was not recorded within the study area.
Burhinus grallarius	Bush Stone-curlew	E1	-	Found sporadically in coastal areas of NSW. Inhabits lowland grassy woodland and open forest with sparse ground layer and fallen timber. Forages in a range of habitats, including grasslands, woodlands, saltmarsh, paddocks, domestic gardens and playing fields. A nocturnal species.	4	Unlikely	No, limited potential habitat within the study area. The proposed activity is avoiding the majority of this habitat, with a single *Corymbia maculata* proposed to be removed
Calidris acuminata	Sharp-tailed Sandpiper	-	V, M	Summer migrant. Widespread in most regions of NSW, especially in coastal areas, but sparse in the south-central Western Plain and east Lower Western Regions. Shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	0	No	No, potential habitat not recorded within the study area. No local records.
Calidris ferruginea	Curlew Sandpiper	CE	CE, M	Occurs along the entire coast of NSW, and sometimes in freshwater wetlands in the Murray-Darling Basin. Littoral and estuarine habitats, including intertidal mudflats, non-tidal swamps, lakes and lagoons on the coast and sometimes inland.	0	No	No, potential habitat not recorded within the study area. No local records.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
Calidris melanotos	Pectoral Sandpiper	-	M	Summer migrant to Australia. Widespread but scattered in NSW. East of the Great Divide, recorded from Casino and Ballina, south to Ulladulla. West of the Great Divide, widespread in the Riverina and Lower Western regions. Shallow fresh to saline wetlands, including coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	0	No	No, potential habitat not recorded within the study area. No local records.
Callocephalon fimbriatum	Gang-gang Cockatoo	E1	E	In NSW, distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. Isolated records known from as far north as Coffs Harbour and as far west as Mudgee. Mature, tall mountain forests and woodlands with dense, shrubby understorey in summer; in winter, may occur at lower altitudes in open eucalypt forests and woodlands, occasionally in more urban areas. Critical habitat are HBTs occurring within stands of trees, dominated by Eucalypt species.	0	Unlikely	No, limited potential foraging habitat recorded within the study area. No breeding habitat recorded within the study area. No local records.
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	In NSW, widespread along coast and inland to the southern tablelands and central western plains, with a small population in the Riverina. Open forest and woodlands of the coast and the Great Dividing Range where stands of she-oak occur, with the species normally relying on one or two species within a region. The species relies on HBTs as breeding habitat, with hollows most often occurring more than 8 m above ground, in branches > 30 cm in diameter and no more than 45° from vertical.	1	Unlikely	No, limited potential foraging habitat recorded within the study area. No breeding habitat recorded within the study area.
Chthonicola sagittata	Speckled Warbler	V	-	From south-eastern Qld, the eastern half of NSW and into Victoria, as far west as the Grampians, mostly on hills and tablelands of the Great Dividing Range and rarely on	1	Unlikely	No, limited potential habitat recorded within the study area.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				coast. Occurs in Eucalyptus-dominated communities with a grassy understorey and sparse shrub layer, often on rocky ridges or in gullies. Pairs are sedentary and occupy a home / breeding territory.			
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	V	From eastern through central NSW, west to Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell. Eucalypt woodlands and dry open forest. Hollows in standing dead or live trees, and tree stumps are essential for nesting. Critical habitat includes areas with relatively undisturbed grassy woodland with a native understorey containing large living and dead trees for roosting and nesting, and fallen timber which provides essential foraging habitat.	0	No	No, preferred undisturbed habitat not recorded within the study area. No local records.
Cuculus optatus	Oriental Cuckoo	-	M	Summer migrant to Australia. Mainly seen in northern Australia, occasionally they are sighted as far south as Sydney. They are more widespread in the Top End and coastal Queensland with the odd vagrant records south to the Pilbara. Oriental Cuckoos are found in more humid habitats such as monsoon forest, wet eucalypt forest, river margins and near mangroves.	0	No	No, preferred habitat not recorded within the study area. No local records.
Daphoenositta chrysoptera	Varied Sittella	V	-	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland. Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.	5	Unlikely	No, limited potential habitat within the study area. The proposed activity is avoiding the majority of this habitat, with a single *Corymbia maculata* proposed to be removed

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
Ephippiorhynchus asiaticus	Black-necked Stork	E1	-	In Australia, Black-necked Storks are widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW (although vagrants may occur further south or inland, well away from breeding areas). In NSW, the species becomes increasingly uncommon south of the Clarence Valley, and rarely occurs south of Sydney. Habitat includes floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries. Storks usually forage in water 5-30cm deep for vertebrate and invertebrate prey. Black-necked Storks build large nests high in tall trees close to water. Trees usually provide clear observation of the surroundings and are at low elevation (reflecting the floodplain habitat).	1	No	No, preferred habitat not recorded within the study area. Species rarely observed in Sydney.
Erythrotriorchis radiatus	Red Goshawk	E1	E	In NSW, range extends to approximately 30°S. Open woodland and forest, often along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, *Melaleuca* swamp forest and coastal riparian *Eucalyptus* forest.	0	No	No, suitable habitat no recorded within the study area. Study area outside of species typical distribution. No local records.
Falco hypoleucos	Grey Falcon	V	V	Arid and semi-arid zones. In NSW, found chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Shrubland, grassland and wooded watercourses, occasionally in open woodlands near the coast, and near wetlands.	0	No	No, suitable habitat no recorded within the study area. Study area outside of species typical distribution. No local records.
Gallinago hardwickii	Latham's Snipe	V	V, M	Migrant to east coast of Australia, extending inland west of the Great Dividing Range in NSW. Freshwater, saline or brackish wetlands up to 2000 m above sea-level;	0	No	No, preferred habitat not recorded within the study area. No local records.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				usually freshwater swamps, flooded grasslands or heathlands.			
Glossopsitta pusilla	Little Lorikeet	V	-	The Little Lorikeet is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and 'locally nomadic' movements are suspected of breeding pairs. Forages primarily in the canopy of open *Eucalyptus* forest and woodland, yet also finds food in *Angophora*, *Melaleuca* and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas, if possible, most typically selecting hollows in the limb or trunk of smooth-barked *Eucalypts*. These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like *Allocasuarina*.	1	Unlikely	No, marginal foraging habitat recorded within the study area. No breeding habitat recorded within the study area. The proposed activity is avoiding majority of foraging habitat, with a single *Corymbia maculata* proposed to be removed.
Grantiella picta	Painted Honeyeater	V	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas. Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. Specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias.	0	No	No, potential habitat not recorded within the study area. No local records.
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	Freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds and coastal waters.	2	Unlikely	No, limited potential habitat recorded within the study area.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas. Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'.			More suitable habitat in the form of riparian vegetation associated with Werrington Creek located to the east of the study area.
Hieraaetus morphnoides	Little Eagle	V	-	It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland, or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	5	Unlikely	No, suitable breeding habitat not recorded within the study area. May occasionally fly over the study area on foraging forays however, unlikely to utilize for extended periods of time.
Hirundapus caudacutus	White-throated Needletail	V	V, M	Non-breeding visitor to Australia. All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide. Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	0	Unlikely	No, the species may potentially forage aerially above the development footprint. However, the species spends the majority of its life in the air. No local records.
Ixobrychus flavicollis	Black Bittern	V	-	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves (DPIE 2020b)	1	No	No, potential habitat not recorded within the study area.
Lathamus discolor	Swift Parrot	E1	CE	Migrates from Tasmania to mainland in Autumn-Winter. In NSW, the species mostly occurs on the coast and south west slopes. Box-ironbark forests and woodlands. Favoured feed trees include winter flowering species such	12	Unlikely	No, marginal foraging habitat recorded within the study area. The proposed activity is avoiding majority of this habitat, with a

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				as *Eucalyptus robusta*, *E. tereticornis*, *Corymbia maculata*, *C. gummifera*, *E. sideroxylon* and *E. albens*.			single *Corymbia maculata* proposed to be removed.
Lophoictinia isura	Square-tailed Kite	V	-	The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW, and Victoria. In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west- flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast, arriving in September, and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. Breeding is from July to February, with nest sites generally located along or near watercourses, in a fork or on large horizontal limbs.	3	Unlikely	No, preferred breeding habitat not recorded within the study area. May occasionally fly over the study area on foraging forays however, unlikely to utilize for extended periods of time.
Melanodryas cucullata cucullata	South-eastern Hooded Robin	E1	E	Found throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies *picata.* Dry eucalypt woodland, acacia scrub and mallee with an open understorey. Rocks and fallen timber form essential foraging habitat.	0	Unlikely	No, preferred habitat not recorded within the study area. No local records.
Motacilla flava	Yellow Wagtail	-	M	Regular summer migrant to mostly coastal Australia. In NSW recorded Sydney to Newcastle, the Hawkesbury and inland in the Bogan LGA. Swamp margins, sewage ponds, saltmarshes form preferred habitat, with the species also recorded from adjacent playing fields, airfields, ploughed land, lawns.	0	Unlikely	No, preferred swamp / wat habitat not recorded within the study area. No local records.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
Neophema chrysostoma	Blue-winged Parrot	V	V	Inhabits a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones. Favours grasslands, grassy woodlands and wetland habitats. Often found near wetlands both near the coast and in semi-arid zones. Blue-winged Parrots can also be seen in altered environments such as airfields, golf courses and paddocks.	0	Unlikely	No, marginal habitat recorded within the study area. Study area outside of the species typical distribution. No local records.
Ninox strenua	Powerful Owl	V	-	The Powerful Owl is endemic to eastern and south-eastern Australia, mainly on the coastal side of the Great Dividing Range from Mackay to south-western Victoria. In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains suggesting occupancy prior to land clearing. The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. It roosts by day in dense vegetation comprising species such as *Syncarpia glomulifera* (Turpentine), *Allocasuarina littoralis* (Black She-oak), *Acacia melanoxylon* (Blackwood), *Angophora floribunda* (Rough-barked Apple), *Exocarpus cupressiformis* (Cherry Ballart) and a number of eucalypt species. The main prey items are medium-sized arboreal marsupials, with most prey species requiring hollows and a shrub layer, which are important habitat components for the owl. Pairs of Powerful Owls demonstrate high fidelity to a large territory, the size of which varies with habitat quality and thus prey densities. Where hollow trees and prey have been depleted, the owls need up to 4000 ha. Powerful	9	Unlikely	No, preferred roosting / breeding habitat not recorded within the study area. May occasionally fly over the study area on foraging forays however, unlikely to utilize for extended periods of time.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts (diameter at breast height of 80-240 cm) that are at least 150 years old.			
Pandion cristatus	Eastern Osprey	V	M	Common around the northern NSW coast, and uncommon to rare from coast further south. Some records from inland areas. Habitat includes rocky shorelines, islands, reefs, mouths of large rivers, lagoons and lakes. Breeds from July to September with nests made high up in dead trees or in dead crowns of lives trees.	1	Unlikely	No, preferred roosting / breeding habitat not recorded within the study area. May occasionally fly over the study area on foraging forays however, unlikely to utilize for extended periods of time.
Petroica boodang	Scarlet Robin	V	-	The Scarlet Robin is found from south east Queensland to south east South Australia and also in Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. This species' nest is an open cup made of plant fibres and cobwebs and is built in the fork of tree usually more than 2 metres above the ground; nests are often found in a dead branch in a live tree, or in a dead tree or shrub. Birds usually occur singly or in pairs,	1	Unlikely	No, preferred habitat containing structure features such as logs and fallen timber not recorded within the study area.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				occasionally in small family parties; pairs stay together year-round.			
Petroica phoenicea	Flame Robin	V	-	The Flame Robin is endemic to south eastern Australia. In NSW, it breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers habitat with clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains). Occur singly, in pairs, or in flocks of up to 40 birds or more; in the non-breeding season they will join up with other insectivorous birds in mixed feeding flocks. Nests are often near the ground and are built in sheltered sites, such as shallow cavities in trees, stumps or banks.	1	Unlikely	No, preferred breeding habitat not recorded within the study area. Marginal foraging habitat present within the study area.
Pluvialis squartarola	Grey Plover	-	M	The Grey Plover breeds around the Arctic regions and migrates to the southern hemisphere, being a regular summer migrant to Australia. The Grey Plover is almost entirely coastal, being found mainly on marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats for feeding, sandy beaches for roosting, and also on rocky coasts.	3	No	No, preferred habitat not identified within the study area.
Pycnoptilus floccosus	Pilotbird	V	V	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. It is sedentary and common.	0	No	No, preferred habitat containing dense undergrowth not recorded within the study area. No local records.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
Rostratula australis	Australian Painted Snipe	E1	E	In NSW, many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. Prefers fringes of swamps, dams, and nearby marshy areas where there is a cover of grasses, lignum, low scrub, or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks, or reeds.	0	No	No, preferred habitat not recorded within the study area. No local records.
Stagonopleura guttata	Diamond Firetail	V	V	Grassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas and lightly wooded farmland. Critical habitat is areas that have not had historical clearing, and are neither fragmented or degraded.	0	Unlikely	No, marginal preferred habitat recorded within the study area. Study area appears to regularly undergoes disturbance through mowing. No local records.
Tringa nebularia	Common Greenshank	E1	E, M	Summer migrant to Australia. Recorded in most coastal regions of NSW; also, widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions. Terrestrial wetlands (swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans, saltflats, sewage farms and saltworks dams, inundated rice crops and bores) and sheltered coastal habitats (mudflats, saltmarsh, mangroves, embayment's, harbours, river estuaries, deltas, lagoons, tidal pools, rock-flats and rock platforms).	0	No	No, potential habitat not recorded within the study area. No local records.
Insect							

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
Meridolum corneovirens	Cumberland Plain	E1	-	Lives in small areas on the Cumberland Plain west of Sydney, from Richmond and Windsor south to Picton and from Liverpool west to the Hawkesbury and Nepean Rivers at the base of the Blue Mountains. Known from over 100 different locations, but not all are currently occupied, and they are usually isolated from each other as a result of land use patterns. Primarily inhabits Cumberland Plain Woodland (a critically endangered ecological community). This community is a grassy, open woodland with occasional dense patches of shrubs. It is also known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities. Lives under litter of bark, leaves and logs, or shelters in loose soil around grass clumps. Occasionally shelters under rubbish. Can dig several centimetres into soil to escape drought.	222	Potential	No, recorded potential habitat not to be impacted by the proposed activity. Mitigation measures to be established prior to commencement of works to avoid impacts to recorded potential habitat.
Mammals (excluding bats)							
Cercartetus nanus	Eastern Pygmy-possum	V	-	The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, *Pseudocheirus peregrinus* (Ringtail	1	No	No, marginal foraging habitat recorded within the study area. No shelter habitat recorded within the study area.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				Possum) dreys or thickets of vegetation. Appear to be mainly solitary.			
Dasyurus maculatus maculatus (SE mainland population)	Spotted-tailed Quoll	V	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld. Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Solitary animals that occur in low densities. Rely on fallen logs, boulder piles, burrows and hollows for shelter.	1	No	No, preferred habitat containing features used for shelter not recorded within the study area. Limited connectivity between the study area and other areas of vegetation.
Petauroides volans	Greater Glider	E1	E	Eastern Australia, from the Windsor Tableland in north Queensland through to central Victoria (Wombat State Forest). Eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. Arboreal, nocturnal species.	0	No	No, preferred old growth forest habitat not recorded within the study area. No local records.
Petaurus australis australis	Yellow-bellied Glider (south-eastern)	V	V	Along the eastern coast to the western slopes of the Great Dividing Range, from southern Qld to Victoria. Tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Live in small family groups in which a den tree is often shared. Arboreal, nocturnal species.	1	No	No, preferred mature forest habitat not recorded within the study area. No shelter habitat recorded within the study area.
Petaurus norfolcensis	Squirrel Glider	V	-	Mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Live in small family groups of a single adult male and one or two adult females and offspring. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of *Acacia* gum, eucalypt sap, nectar, honeydew and manna, with	1	No	No, marginal foraging habitat recorded within the study area. No shelter habitat recorded within the study area.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				invertebrates and pollen providing protein. Arboreal, nocturnal species.			
Petrogale penicillata	Brush-tailed Rock-wallaby	E1	V	In NSW they occur from the Qld border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges.	0	No	No, preferred habitat not recorded within the study area. No local records.
Phascolarctos cinereus	Koala	E1	E	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct populations in the Bega District, and at several sites on the southern tablelands. Inhabits eucalypt woodlands and forests.	0	No	No, marginal foraging habitat recorded within the study area. Limited connectivity between the study area and other areas of vegetation. No local records.
Pseudomys novaehollandiae	New Holland Mouse	-	V	Fragmented distribution across eastern NSW. Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. It is a social animal, living predominantly in burrows shared with other individuals.	0	No	No, preferred heath understorey habitat not recorded within the study area. No local records.
Mammals (bats)							
Chalinolobus dwyeri	Large-eared Pied Bat	E1	E	Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes. Roosting habitat includes areas featuring cliffs, escarpments or rocky outcrops. Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	2	Unlikely	No, roosting habitat not recorded within the study area. May occasionally fly through the study area on foraging forays however, unlikely to utilize for extended periods of time.
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland	3	Unlikely	No, roosting habitat not recorded within the study area.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				to Victoria and Tasmania. Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy. Hibernates in winter.			May occasionally fly through the study area on foraging forays however, unlikely to utilize for extended periods of time.
Micronomus norfolkensis	Eastern Coastal Free-tail Bat	V	-	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous.	7	Unlikely	No, roosting habitat not recorded within the study area. May occasionally fly through the study area on foraging forays however, unlikely to utilize for extended periods of time.
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	Eastern Bent-winged Bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. At other times of the year, populations disperse within about 300 km range of maternity caves. Hunt in forested areas, catching moths and other flying insects above the tree tops.	18	Unlikely	No, roosting habitat not recorded within the study area. May occasionally fly through the study area on foraging forays however, unlikely to utilize for extended periods of time.
Myotis macropus	Southern Myotis	V	-	The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams	7	Unlikely	No, roosting habitat not recorded within the study area. Foraging habitat not recorded within the study area.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				and pools catching insects and small fish by raking their feet across the water surface.			
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria. Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	215	Potential	No, marginal foraging habitat recorded within the study area. The proposed activity is avoiding majority of this habitat, with a single *Corymbia maculata* proposed to be removed.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	1	Unlikely	No, roosting habitat not recorded within the study area. Foraging habitat not recorded within the study area.
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however, does not occur at altitudes above 500 m. Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species	2	Unlikely	No, roosting habitat not recorded within the study area. Foraging habitat not recorded within the study area.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species. Little is known of its reproductive cycle, however a single young is born in January; prior to birth, females congregate at maternity sites located in suitable trees, where they appear to exclude males during the birth and raising of the single young.			
Reptiles							
Aprasia parapulchella	Pink-tailed Worm-lizard	V	V	In NSW, only known from Central and Southern Tablelands and the South Western Slopes. Sloping, open woodland areas with predominantly native grassy ground layers, rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.	0	No	No, preferred grassland habitat containing rock habitat features not recorded within the study area. No local records.
Hoplocephalus bungaroides	Broad-headed Snake	E1	E	Largely confined to Triassic and Permian sandstones within the coast and ranges in an area within approximately 250 km of Sydney. Dry and wet sclerophyll forests, riverine forests, coastal heath swamps, rocky outcrops, heaths, grassy woodlands. Moves from sandstone rocks to shelter in crevices or hollows in large trees nearby to escarpments in summer.	1	No	No, study area not situated close to an escarpment. Marginal habitat recorded within the study area.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
FLORA							
Acacia bynoeana	Bynoe's Wattle	E1	V	Found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. Heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple.	0	Unlikely	No, the study area is mapped as occurring on shale soils (NSW DCCEEW 2024e). The species was not recorded within the study area. No local records.
Acacia pubescens	Downy Wattle	V	V	Restricted to Sydney region, most commonly observed around Bankstown-Fairfield-Rookwood and Pitt Town areas. Occurs in open woodland and forest including Coos River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland. Occurs on alluviums, shales and at the intergrade between shales and sandstones.	1	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. the proposed activity is avoiding potential habitat within the study area.
Allocasuarina glareicola	-	E1	E	Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier population found at Voyager Point, Liverpool. Castlereagh woodland on lateritic soil. Found in open woodland with *Eucalyptus parramattensis*, *Eucalyptus fibrosa*, *Angophora bakeri*, *Eucalyptus sclerophylla* and *Melaleuca decora*.	0	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area. No local records.
Cynanchum elegans	White-flowered Wax Plant	E1	E	Restricted to eastern NSW, from Brunswick Heads on the north coast to Gerroa in the Illawarra region, and as far west as Merriwa in the upper Hunter River valley. Dry rainforest; littoral rainforest; *Leptospermum laevigatum-Banksia integrifolia* subsp. *integrifolia* (Coastal Tea-tree–Coastal Banksia) coastal scrub; *Eucalyptus tereticornis*	0	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area. No local records.

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				(Forest Red Gum) or *Corymbia maculata* (Spotted Gum) open forest and woodland; and *Melaleuca armillaris* (Bracelet Honeymyrtle) scrub.			
Dillwynia tenuifolia	-	V	-	The core distribution is the Cumberland Plain from Windsor and Penrith east to Dean Park near Colebee. Other populations in western Sydney are recorded from Voyager Point and Kemps Creek in the Liverpool LGA, Luddenham in the Penrith LGA and South Maroota in the Baulkham Hills Shire. Disjunct localities outside the Cumberland Plain include the Bulga Mountains at Yengo in the north, and Kurrajong Heights and Woodford in the Lower Blue Mountains.	19	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area.
Eucalyptus aggregata	Black Gum	V	V	In NSW, found in the Central and Southern Tablelands, in the South Eastern Highlands Bioregion and on the western fringe of the Sydney Basin Bioregion. Grows on alluvial soils, on cold, poorly-drained flats and hollows adjacent to creeks and small rivers. Usually occurs in open woodland with a grassy ground layer.	0	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area. No local records.
Eucalyptus benthamii	Camden White Gum	CE	CE	Alluvial flats of the Nepean River and its tributaries. Mainly Kedumba Valley of the Blue Mountains National Park and Bents Basin State Recreation Area. Also, along the Nepean River around Camden and Cobbitty, at Werriberri (Monkey) Creek in The Oaks, and on the Nattai River in Nattai National Park. Occurs in open forest. Requires a combination of deep alluvial sands and a flooding regime.	0	No	No, preferred habitat not recorded within the study area. No local records.
Genoplesium baueri	Bauer's Midge Orchid	E1	E	Has been recorded from locations between Nowra and Pittwater and may occur as far north as Port Stephens. Dry sclerophyll forest and moss gardens over sandstone.	0	No	No, preferred sandstone habitat not recorded within the study area. No local records.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
Grevillea juniperina subsp. *juniperina*	Juniper-leaved Grevillea	V	-	Endemic to Western Sydney. Habitat includes Cumberland Plain Woodland, Castlereagh Ironbark Woodland, Castlereagh Scribbly Gum Woodland and Shale/Gravel Transition Forest, on reddish clay to sandy soils derived from Wianamatta Shale and Tertiary alluvium. Associated canopy species vary with communities but include *Eucalyptus tereticornis*, *E. moluccana*, *E. crebra*, *E. fibrosa*, *E. eugenioides*, *E. sclerophylla*, *Angophora bakeri* and *Melaleuca decora*. Flowering may occur sporadically throughout the year, but particularly between July and October.	347	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area.
Haloragis exalata subsp. *exalata*	Wingless Raspwort	V	V	Disjunct distribution in the Central Coast, South Coast and North Western Slopes botanical subdivisions of NSW. Protected and shaded damp situations in riparian habitats.	0	No	No, riparian habitat not recorded within the study area.
Marsdenia viridiflora subsp. *viridiflora*	-	E2	-	Razorback Range, also recorded at Prospect, Bankstown, Smithfield, Cabramatta Creek and St Marys. Habitat includes vine thickets and open shale woodland.	682	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area.
Melaleuca deanei	Deane's Melaleuca	V	V	Ku-ring-gai/Berowra area, Holsworthy/Wedderburn area, Springwood (in the Blue Mountains), Wollemi National Park, Yalwal (west of Nowra) and Central Coast (Hawkesbury River) areas. Heath on sandstone.	4	No	No, the study area is mapped as occurring on shale soils (NSW DCCEEW 2024e). Heathland habitat not recorded within the study area.
Micromyrtus blakelyi	-	V	V	Restricted to areas near the Hawkesbury River, north of Sydney. Distribution extends from north of Maroota in	0	No	No, preferred habitat not recorded within the study area. No local records.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				the north, to Cowan in the south. Heathlands in shallow sandy soil, on sandstone rock platforms.			
Micromyrtus minutiflora	-	E1	V	Restricted to the general area between Richmond and Penrith, western Sydney. Habitat includes Castlereagh Scribbly Gum Woodland, Ironbark Forest, Shale/Gravel Transition Forest, open forest on tertiary alluvium and consolidated river sediments.	1	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area.
Persicaria elatior	Tall Knotweed	V	V	In south-eastern NSW recorded from Mt Dromedary, Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). Beside streams and lakes, swamp forest or disturbed areas.	0	No	No, preferred riparian habitat not recorded within study area. No local records.
Persoonia nutans	Nodding Geebung	E1	E	Restricted to the Cumberland Plain in western Sydney, between Richmond in the north and Macquarie Fields in the south. Northern populations: sclerophyll forest and woodland (Agnes Banks Woodland, Castlereagh Scribbly Gum Woodland and Cooks River / Castlereagh Ironbark Forest) on aeolian and alluvial sediments. Southern populations: tertiary alluvium, shale sandstone transition communities and Cooks River / Castlereagh Ironbark Forest.	1	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area.
Pimelea curviflora var. *curviflora*	-	V	V	Confined to the coastal area of the Sydney and Illawarra regions between northern Sydney and Maroota in the north-west and Croom Reserve near Albion Park in the south. Occurs in woodland, mostly on shaley/lateritic	0	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Habitat	Records within 5 km of the study area (BioNet)	Likelihood of Occurrence	Impact Assessment Required
				soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes.			potential habitat within the study area. No local records.
Pimelea spicata	Spiked-Rice-flower	E1	E	Two disjunct areas; the Cumberland Plain (Marayong and Prospect Reservoir south to Narellan and Douglas Park) and the Illawarra (Landsdowne to Shellharbour to northern Kiama). Well-structured clay soils. *Eucalyptus moluccana* (Grey Box) communities and in areas of ironbark on the Cumberland Plain. Coast Banksia open woodland or coastal grassland in the Illawarra.	66	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area.
Pomaderris brunnea	Brown Pomaderris	E1	V	In NSW, found around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. It also occurs near Walcha on the New England tablelands. Moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	0	No	No, preferred moist / riparian habitat not recorded within the study area. No local records.
Pterostylis saxicola	Sydney Plains Greenhood	E1	E	Restricted to western Sydney between Freemans Reach in the north and Picton in the south. Small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines, adjacent to sclerophyll forest or woodland on shale/sandstone transition soils or shale soils.	0	No	No, preferred sandstone rock shelf habitat not recorded within the study area. No local records.
Pultenaea parviflora	-	E1	V	Endemic to the Cumberland Plain. Mainly from Windsor to Penrith and east to Dean Park, with outlier populations at Kemps Creek and Wilberforce. Dry sclerophyll forest, especially Castlereagh Ironbark Forest, Shale Gravel Transition Forest and transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland.	9	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area. No local records.

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Rhizanthella slateri	Eastern Underground Orchid	V	E	In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Sclerophyll forest in shallow to deep loams.	0	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area. No local records.
Rhodamnia rubescens	Scrub Turpentine	CE	CE	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Populations of *R. rubescens* typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m a.s.l. in areas with rainfall of 1,000-1,600 mm. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	0	No	No, rainforest habitat not recorded within the study area. No local records.
Senna acclinis	Rainforest Cassia	E1	-	Coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Qld. Occurs in subtropical and dry rainforest.	1	No	No, rainforest habitat not recorded within the study area. No local records.
Syzygium paniculatum	Magenta Lilly Pilly	E1	V	Only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. Subtropical and littoral rainforest on gravels, sands, silts and clays.	1	No	No, rainforest habitat not recorded within the study area. No local records.
Thesium australe	Austral Toadflax	V	V	In eastern NSW it is found in very small populations scattered along the coast, and from the Northern to Southern Tablelands. Grassland on coastal headlands or grassland and grassy woodland away from the coast.	0	Unlikely	No, the study area is regularly disturbed. The species was not recorded within the study area. The proposed activity is avoiding potential habitat within the study area. No local records.

BC ACT STATUS: CE = CRITICALLY ENDANGERED; E1 = ENDANGERED; E2 = ENDANGERED POPULATION; EPBC ACT STATUS: CE = CRITICALLY ENDANGERED, E = ENDANGERED, V = VULNERABLE, M = MIGRATORY