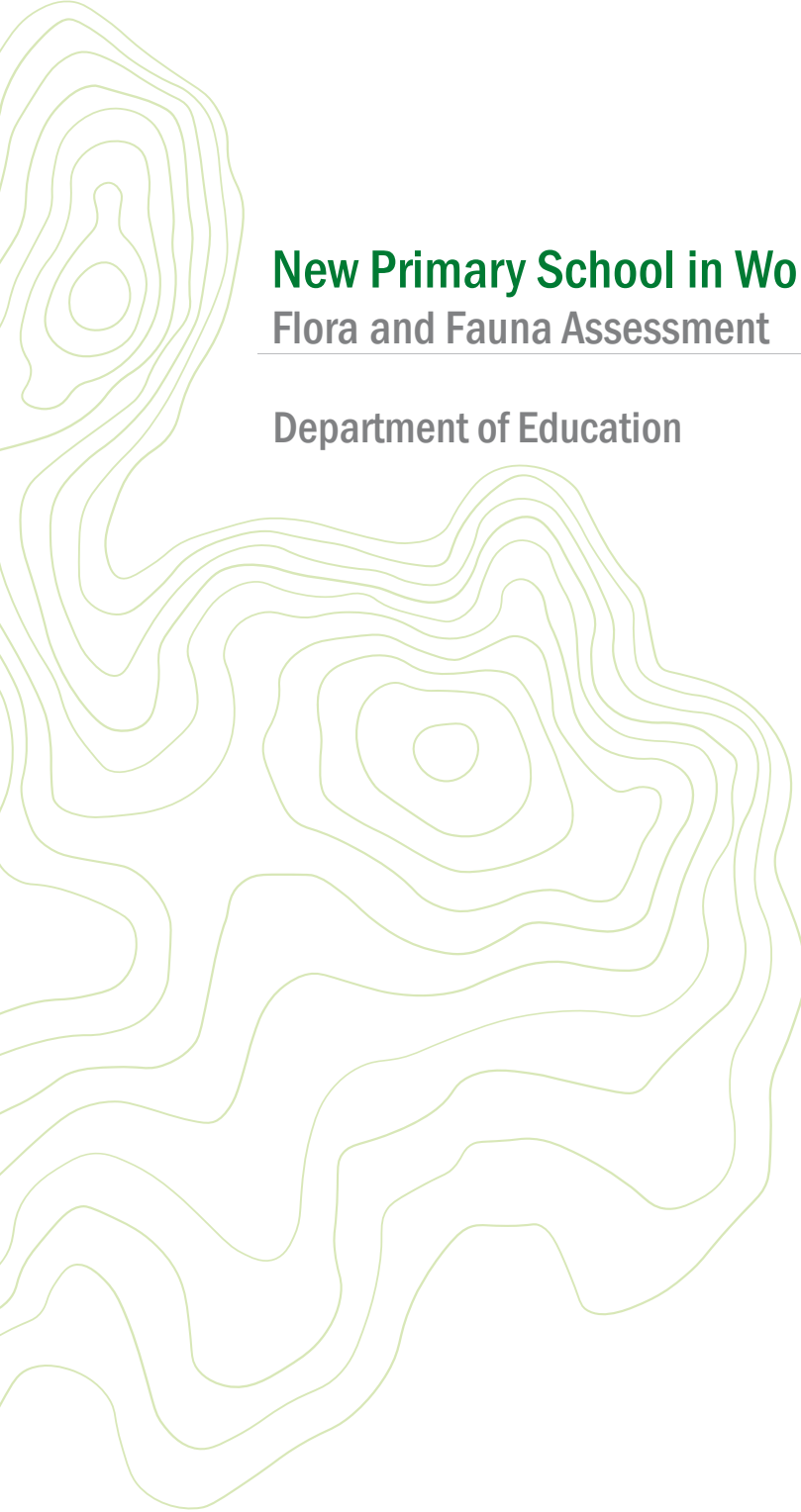




New Primary School in Worrigeer

Flora and Fauna Assessment

Department of Education

DOCUMENT TRACKING

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Template 2.8.1

Executive Summary

Eco Logical Australia Pty Ltd (ELA) was engaged by the NSW Department of Education (DoE) to prepare a Flora and Fauna Assessment (FFA) for the proposed new primary school at 9 Worrigeer Road, Worrigeer NSW 2540 (the 'study area').

This FFA has been prepared to accompany a Review of Environmental Factors (REF) for the Department of Education (the department) for the construction and operation of a New Primary School in Worrigeer (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* (TI SEPP).

This report assesses the potential impacts of the proposed works on flora and fauna species listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and Commonwealth *Environment Protection and Biodiversity Conservation 1999* (EPBC Act).

Field surveys (conducted during 2024 and 2026) validated the native vegetation with the study area as Plant Community Type (PCT) 3269 Shoalhaven Lowland Spotted Gum-Paperbark Forest in degraded condition. PCT 3269 does not conform to the *Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion* threatened ecological community (TEC) listed under the BC Act, as it is outside of the geographic distribution for the TEC. Additionally, PCT 3269 (degraded condition) did not meet the listing criteria for the EPBC Act listed TEC *Illawarra and south coast lowland forest and woodland ecological community* which PCT 3269 due to the native ground cover less than 30%. The remaining vegetation within the study area contained planted native/exotic vegetation and exotic grass which do not represent part of a native PCT. The proposed activity will directly impact upon 0.19 ha of PCT 3269 degraded condition. This includes 0.02 ha of PCT 3269 which represents two trees (#1 and 64) which may be retained, subject to root mapping. A worse-case scenario was applied and the impacts from the removal of these two trees was included in this assessment as an impact. Additionally, 0.19 ha of PCT 3269 degraded will also be disturbed during landscape works. The canopy will be retained, however, the existing groundlayer including soil profile will be disturbed. This partial disturbance has been included in this assessment.

No threatened flora or fauna species have previously been recorded from BioNet records within the study area. The study area contained five hollow bearing trees of which four will be removed for the proposed activity within the study area and one retained in landscaped areas. These have the potential to provide roosting habitat for threatened microbats and *Calyptrorhynchus lathamii lathamii* (south-eastern glossy black cockatoo). The vegetation mapped within the study area contains winter flowering tree species *Corymbia maculata* (spotted gum). This is an important foraging resource for *Pteropus poliocephalus* (grey-headed flying-fox) and *Callocephalon fimbriatum* (gang-gang cockatoo) during winter.

Tests of Significance under the BC Act and Assessments of Significance under the EPBC Act were applied to grey-headed flying-fox, gang-gang cockatoo and south-eastern glossy black cockatoo and microbats which may be directly impacted or indirectly impacted on by the proposal. Cumulative impacts have been included which assesses the impacts from the approved Preschool and Public School impacts. The assessments concluded that the proposal is considered unlikely to have a significant impact on this threatened entity, 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 adjacent to the study area (Section 7).

Contents

Executive Summary	ii
Abbreviations	vi
1. Introduction	1
1.1. Project description	1
1.2. Activity description	2
1.3. Activity site.....	4
1.4. Biodiversity Offset Scheme (BOS)	5
1.5. Terminology.....	5
2. Legislation Context	9
3. Methodology	12
3.1. Literature review.....	12
3.2. Field survey	13
3.2.1. Initial site inspection	13
3.2.2. Additional site inspection for the preschool within the broader site	13
3.3. Limitations	13
4. Results of literature review	14
4.1. Soils and Hydrology.....	14
4.2. Review of desktop imagery	14
4.2.1. Historic aerial imagery	14
4.2.2. Current aerial imagery	19
4.3. Previous vegetation mapping	19
4.3.1. Biodiversity Values Map	19
4.3.2. Plant Community Types mapped within the study area	20
4.3.3. Plant Community Types in the broader landscape	20
4.4. Threatened ecological communities	22
4.5. Flora species	22
4.5.1. Threatened flora species	22
4.6. Fauna species.....	24
4.6.1. Threatened fauna species	24
5. Field Results	26
5.1. Vegetation communities.....	26
5.1.1. PCT 3269 Shoalhaven Lowland Spotted Gum-Paperbark Forest – degraded condition	28
5.1.2. Planted native/exotic vegetation	28
5.1.3. Exotic grass	29
5.2. Threatened ecological communities	30
5.2.1. BC Act listing criteria	30
5.2.2. EPBC Act listing criteria	30
5.3. Flora species and habitat	32
5.4. Fauna species and habitat	32
6. Impact Assessment	34
6.1. Introduction.....	34
6.2. Direct Impacts.....	34
6.2.1. Removal of native vegetation.....	37
6.2.2. Removal of potential habitat for threatened fauna species.....	37

6.2.3. Ground layer disturbance	37
6.3. Cumulative Impacts	38
6.3.1. Cumulative fauna habitat impacts	39
6.4. Biodiversity Conservation Act 2016 (BC Act)	40
6.4.1. Key Threatening Processes	40
6.5. Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	41
6.6. Shoalhaven Local Environment Plan 2014 (Shoalhaven LEP)	41
6.7. Shoalhaven Development Control Plan 2014 (Shoalhaven DCP)	42
7. Mitigation Measures	43
8. Adequacy review	45
9. Significance of Environmental Impacts	46
10. Conclusion	47

List of Figures

Figure 1: Indicative Site Plan (Bennett and Trimble 2026)	3
Figure 2: Aerial photograph(supplied by DoE) of the cadastre boundary of 9 Worrigee Road, Worrigee.	4
Figure 3: study area and development footprint and landscaping works	6
Figure 4: Study area within the broader locality	7
Figure 5: Study area zoning	8
Figure 6: Biodiversity Values map (NSW DCCEEW 2026f) (last viewed 19 March 2026)	11
Figure 7: 1970 aerial imagery (Spatial Services 2026)	15
Figure 8: 1980 aerial imagery (Spatial Services 2026)	16
Figure 9: 1993 aerial imagery (Spatial Services 2026)	17
Figure 10: 2001 aerial imagery (Spatial Services 2026)	18
Figure 11: Previous vegetation mapping (DCCEEW 2024c)	21
Figure 12: Threatened flora species records within 5 km radius of the study area (NSW DCCEEW 2025a)	23
Figure 13: Threatened fauna species records within 5 km radius of the study area (NSW DCCEEW 2025a)	25
Figure 14: Validated vegetation and habitat features (ELA 2026)	27
Figure 15: PCT 3269 (degraded condition) within the study area	28
Figure 16: Planted native/exotic vegetation occurring within an orchid on the property adjacent to the study area.	29
Figure 17: Exotic grass within the study area	29
Figure 18: A hollow bearing tree (tree 1), with several hollows in the study area that could potentially provide habitat for threatened microbats and birds. This tree is subject to root mapping and be retained if possible, in the study area	33
Figure 19: Trees impacted by the proposed activity (ELA AIA 2026)	36

List of Tables

Table 1: Summary of Relevant Section of the Guidelines and EP&A Regulation	1
--	---

Table 2: Legislation relevant to the study area	9
Table 3: Validated vegetation recorded within the study area	26
Table 4: Condition thresholds for patches of <i>Illawarra and south coast lowland forest</i> in the EPBC Act	31
Table 5: Habitat features recorded in the study area	33
Table 6: Summary of potential impacts to vegetation in study area and fauna habitat	35
Table 7: Cumulative impacts	38
Table 8: Test of Significance under the BC Act to determine if the cumulative impacts is significant ...	38
Table 9: Shoalhaven Local Environmental Plan 2014 relevant biodiversity and zoning clauses	41
Table 10: Mitigation measures	43
Table 11: REF deliverable requirements	45
Table 12: Threatened ecological communities' likelihood of occurrence.....	51
Table 13: Threatened and migratory species likelihood of occurrence.	54
Table 14: BC Act Test of Significance for GHFF	82
Table 15: BC Act Test of Significance for vulnerable microbat species	87
Table 16: Test of significance for South-eastern Glossy Black Cockatoo	90
Table 17: Test of significance for South-eastern Glossy Black Cockatoo	94
Table 18: EPBC Act Assessment for <i>Pteropus poliocephalus</i> (Grey-headed Flying-fox)	99
Table 19: EPBC Act impact assessment for <i>Calyptorhynchus lathami lathami</i> (south-eastern glossy black-cockatoo).....	102
Table 20: EPBC Act impact assessment for <i>Callocephalon fimbriatum</i> (gang-gang cockatoo).....	104
Table 21: Flora species recorded in the vegetation plot.....	107

List of Appendices

Appendix A Likelihood of Occurrence

Appendix B Test of Significance (BC Act)

B1: *Pteropus poliocephalus* (grey-headed flying-fox)

B2: Microchiropteran Bats

B3: *Calyptorhynchus lathami lathami* (south-eastern glossy black cockatoo)

B4: *Callocephalon fimbriatum* (gang-gang cockatoo)

Appendix C Assessment of Significance

C1: *Pteropus poliocephalus* (grey-headed flying-fox)

C2: *Calyptorhynchus lathami lathami* (south-eastern glossy black-cockatoo)

C3: *Callocephalon fimbriatum* (gang-gang cockatoo)

Appendix D Vegetation Integrity Plot

Abbreviations

Abbreviation	Description
ALA	Atlas of Living Australia
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BAM	Biodiversity Assessment Method
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
BV Map	Biodiversity Values Map
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DCP	Development Control Plan
DoE	Department of Education
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FM Act	NSW <i>Fisheries Management Act 1994</i>
ha	Hectares
LEP	Local Environment Plan
LGA	Local Government Area
MNES	Matters of National Environmental Significance
NSW	New South Wales
NSW DCCEEW	New South Wales Department of Climate Change, Energy, the Environment, and Water
PCT	Plant Community Type
PMST	Protected Matters Search Tool
SAII	Serious and Irreversible Impacts
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SSD	State Significant Development
TEC	Threatened ecological community
VIS	Vegetation Information System
WM Act	NSW <i>Water Management Act 2000</i>

1. Introduction

1.1. Project description

This Flora and Fauna Assessment (FFA) report has been prepared to accompany a Review of Environmental Factors (REF) for the Department of Education (the department) for the construction and operation of a New Primary School in Worrigee (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* (TI SEPP).

This document has been prepared in accordance with the *Guidelines for Division 5.1 assessments* (DPHI, December 2025) (the Guidelines). This report examines and takes into account the relevant environmental factors in the Guidelines and Section 170 and Section 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) as outlined in Table 1.

Table 1: Summary of Relevant Section of the Guidelines and EP&A Regulation

Environmental factor	Division Factors for school developments	Response	Report Section
(c) Any environmental impact on the ecosystems of the locality?	(c1) impact on the existing and future ecosystem (flora, fauna, habitats, biodiversity, ecological integrity, biological diversity, connectivity/fragmentation, air, water including hydrology, soil). (c2) long- and short-term impact of: (i) loss or harm to trees or other vegetation (ii) removed canopy cover (iii) landscape setting in respect of the site and streetscape (iv) impacts of the above on urban heat island effect and urban and internal comfort levels on and off-site (c3) impact from introducing new trees and vegetation species (c4) cumulative impacts on the ecosystem	(C1) The likelihood of occurrence identified threatened species which may be impacted by the activity. Test of Significance under the BC Act and Assessments of Significance under the EPBC Act were conducted for impact to threatened entities. (c2) An impact assessment of the direct and indirect impacts is provided in Section 6. (c3) The AIA (ELA 2026a) assesses trees impacts (c4) cumulative impacts considered in the impact assessment.	Refer to Appendix A, Appendix B, Appendix C (c2) Section 6 (c4) Section 6.3
(f) Any impact on the habitat of protected animals, within the meaning of the Biodiversity Conservation Act 2016?	(f1) impacts on listed protected fauna at and in the vicinity of the site, and their habitat.	(f1) An impact assessment of the direct and indirect impacts is provided in Section 6.	(c2) Section 6
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?	(g1) potential endangering of any species or vegetation (g2) protected and threatened flora, terrestrial, fauna species, populations, ecological communities and their habitats	(g1) The likelihood of occurrence identified threatened species which may be recorded within the study area (g2) Mitigation measure to protect species provided.	(g1) Refer to Appendix A (g2) Section 7
(h) long-term effects on the environment	(h1) Long-term effects on: i. flood and bushfire behaviour, flooding and the flood plain, bushfire prone land ii. natural environment, flora and fauna species and their habitats	i) floods and bushfire (ELA 2026b) assessed in separate reports	(ii) Section 6

Environmental factor	Division Factors for school developments	Response	Report Section
		ii) This FFA assesses the impacts on flora and fauna species.	

1.2. Activity description

The activity is for the construction and operation of a New Primary School in Worrigee under Chapter 2 and Chapter 3 of TI SEPP comprising:

- permanent classroom building including a support learning unit
- hall
- canteen
- covered outdoor learning area
- library
- administration
- sports field
- waste storage facility
- landscaping
- car parking
- public domain works
- infrastructure upgrades
- a capacity of 582 students

The proposed activity does not include the new public preschool or roundabout. The new public preschool is subject to a separate planning pathway and environmental assessment and has been recently approved (June 2026). The roundabout is to be delivered by Council. Figure 1 shows an indicative site plan and distinguishes the indicative extent of the proposed activity in relation to the new public preschool and roundabout. Removal of vegetation for the proposed roundabout by council will be assessed under a separate ecological assessment, impacts have been excluded from this FFA.

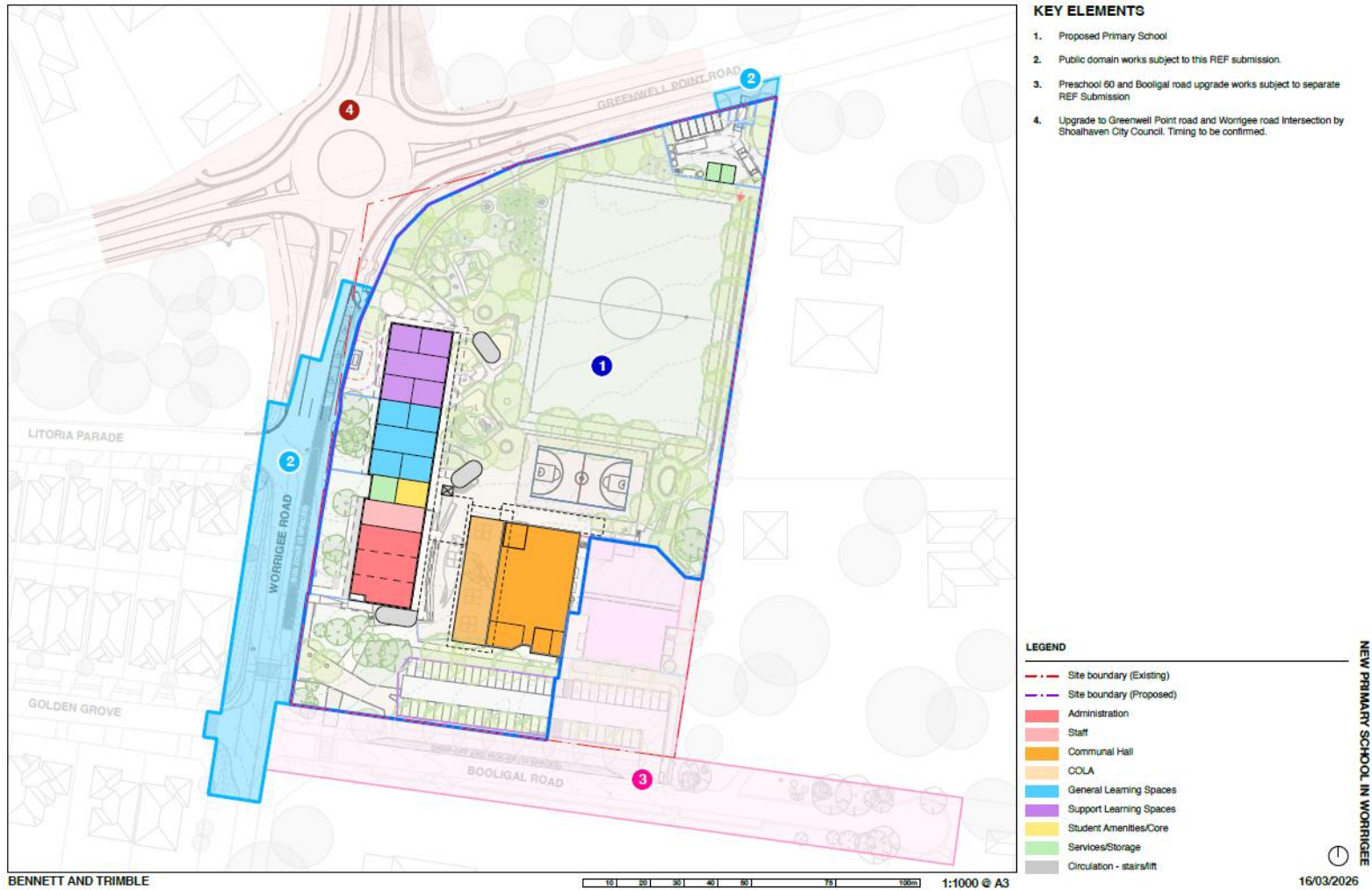


Figure 1: Indicative Site Plan (Bennett and Trimble 2026)

1.3. Activity site

The site is known as 9 Worrigeer Road, Worrigeer. The site has a frontage of 125.23 m to Greenwell Point Road, 149.87m to Worrigeer Road and 114.89 m to Booligal Road (including the preschool frontage). The site is legally described as Lot 1 in Deposited Plan 576975 and is 2 hectares (by title). Off-site works are also proposed in the adjacent road reserves. **Figure 2** provides an aerial photograph of the site.



Figure 2: Aerial photograph(supplied by DoE) of the cadastre boundary of 9 Worrigeer Road, Worrigeer.

1.4. Biodiversity Offset Scheme (BOS)

The BOS thresholds such as clearing limits or impacts to land mapped on the biodiversity values map, do not apply to Part 5 activities. For a REF, the BOS may apply if the determining authority determined the activity would result in a significant impact. If the proposed works are likely to result in a significant impact, the activity may opt into the BOS and prepare a Biodiversity Development Assessment Report (BDAR). Alternatively, if the activity significantly impacts a threatened species a Species Impact Statement (SIS) may be prepared and must seek concurrence from the Environmental Agency Head.

A Part 5 activity is likely to significantly affect threatened species if:

- it is carried out in an area of outstanding biodiversity value
- it is likely to significantly affect threatened species or ecological communities, or their habitats, according to the test in section 7.3 of the Act.

This report determined that there is no areas of declared outstanding biodiversity value within the study area. Additionally, tests of significance determined that the activity is unlikely to result in a significant impact to threatened species or ecological communities (Appendix B). Therefore, the activity can be assessed as part of an FFA.

1.5. Terminology

The following terminology has been used in this report:

- The activity - a proposed New Primary School in Worrigee
- Development footprint – the portion of the lot proposed for development for the activity (New Primary School in Worrigee). This includes direct impacts for the removal of vegetation and construction works for the proposed activity.
- Landscaping works - landscaping works include areas where the canopy which will be retained and the groundlayer disturbed for earthworks or paving, planting and playground works. These are considered impacts to the ground layer.
- Study area – this includes the direct impacts of the proposed activity including the development footprint and the extent of the vegetation for removal and landscaping works. The study area does not include the portion of the lot proposed for the New Preschool in Worrigee and roadworks along Booligal Road which will be assessed under a separate REF. This assessment does not include impacts to the removal of trees for the proposed council roundabout in the north-west of the study area. The council works will be assessed under a separate document.
- The site – includes the extent of works for both the proposed New Public School in Worrigee and the Worrigee New Preschool. This includes the entire 9 Worrigee Road, Worrigee, lot (Lot 1 DP 576975) and works along Booligal Road.



Figure 3: study area and development footprint and landscaping works



Figure 4: Study area within the broader locality



Figure 5: Study area zoning

2. Legislation Context

Legislation relevant to the study area is outlined in Table 2

Table 2: Legislation relevant to the study area

Name	Relevance to the project	Report Section
Commonwealth		
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (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 a development 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. Three MNES have the potential to occur within the study area: • <i>Pteropus poliocephalus</i> (grey-headed flying-fox) • <i>Calyptorhynchus lathami lathami</i> (glossy black cockatoo) • <i>Callocephalon fimbriatum</i> (gang-gang cockatoo). The assessments concluded that the proposed activity is unlikely to result in a significant impact to any of the above entities. As such, a referral to the Commonwealth is unlikely to be required as a part of the proposed activity.	Appendix C
State		
<i>Environmental Planning and Assessment Act 1979</i> (EP&A Act)	The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of development proposals. The 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). Part 5.1 requires public authorities to assess environmental impacts (using a Review of Environmental Factors or REF) for developments like schools and health facilities that are permitted without consent.	Entire report
<i>Biodiversity Conservation Act 2016</i> (BC Act)	The BC Act outlines the assessment requirements to determine whether future development is likely to significantly affect threatened species or ecological communities, or their habitats under section 7.3 of the BC Act, known as 'test of significance'. The proposed development proceeds as a Review of Environmental Factors (REF) under Part 5 of the EP&A Act. For assessments under Part 5 Division 5.1 of the EP&A Act, the Biodiversity Offsets Scheme (BOS) 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. 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 an SIS, or a BDAR. The proposed activity 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 preparation of an FFA report may be required for the REF. The study area is not located within declared areas of outstanding biodiversity value.	Entire report and Tests of significance in Appendix B.
<i>Local Land Services Amendment Act 2016</i> (LLS Act)	The clearing of native vegetation is to be assessed under Part 5 of the EP&A Act and therefore, the LLS Act would not apply.	N/A
<i>Fisheries Management Act 1994</i> (FM Act)	The study area does not contain Key Fish Habitat, and will not involve harm to marine vegetation, dredging, reclamation, or obstruction of fish passage. A permit or consultation under the FM Act is not required.	N/A
<i>Water Management Act 2000</i> (WM Act)	No watercourses have been mapped as occurring within the study area, and therefore the study area does not include waterfront land (land within 40 m of a waterbody) (Figure 5). Therefore, a Controlled Activity Approval under s91 of the WM Act is not required.	N/A

Name	Relevance to the project	Report Section
Planning instruments		
<i>State Environmental Planning Policy (Resilience and Hazards) 2021</i>	This SEPP applies to land in the coastal zone. According to Chapter 2 of the SEPP this aims of the Resilience and Hazard SEPP is: (a) managing development in the coastal zone and protecting the environmental assets of the coast, and (b) establishing a framework for land use planning to guide decision making in the coastal zone, and (c) mapping the 4 coastal management areas that comprise the NSW coastal zone for the purpose of the definitions in the <i>Coastal Management Act 2016</i>. The study area is <u>not</u> located within an area to which this SEPP applies.	N/A
<i>State Environmental Planning Policy 2021 (Biodiversity and Conservation)</i> (Biodiversity and Conservation SEPP)	The Minister for Planning and Public Spaces announced that on 1 March 2022 the commencement of the new Biodiversity and Conservation SEPP. The Biodiversity and Conservation SEPP consolidates 11 SEPPs into one new theme-based focus SEPP. The following chapters are relevant for this project: • Chapter 2 Vegetation in Non-Rural Areas. • Chapter 4 Koala Habitat Protection. • Chapter 6 Water Catchments. Chapter 2 applies to development that does not require consent. If the proposed development does require consent under the EP&A Act, the Vegetation chapter does not apply. Therefore, DoE does not need to consider Chapter 2 of the Biodiversity and Conservation SEPP as the activity will be assessed under the Part 5 approval pathway. The proposed activity is located within a Local Government Area (LGA) to which the Biodiversity and Conservation SEPP applies in relation to Chapter 4 Koala Habitat Protection. However, the activity is assessed under Part 5 of the EP&A Act, therefore, the SEPP Chapter 4 does not apply. Chapter 6 applies to land that falls within four listed catchments. As the study area was outside the four catchment areas, this chapter does not apply.	N/A
<i>Shoalhaven Local Environment Plan 2014</i> (Shoalhaven LEP)	<u>Land Zoning</u> The study area is zoned R5 – Large Lot Residential under the Shoalhaven LEP (Figure 5). The objectives of R5 zoning are: • To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality. • To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future. • To ensure that development in the area does not unreasonably increase the demand for public services or public facilities. • To minimise conflict between land uses within this zone and land uses within adjoining zones. The proposed activity are permitted with consent under the LEP for R5 zoning. The study area is not mapped under the Terrestrial Biodiversity mapping of the LEP (Figure 6).	Figure 5 and Section 6.5
<i>Shoalhaven Development Control Plan 2014</i> (Shoalhaven DCP)	Shoalhaven DCP contains provisions relating to biodiversity impact assessment. Chapter G5 provides desired objectives for all forms of development. These objectives are: • Protect threatened species, populations and TECs against direct and indirect impacts generated by development. • Ensure that developments which have the potential to impact upon threatened species, populations or TECs are assessed in accordance with legislative requirements. The proposed activity will be assessed as a Part 5 REF and therefore, consideration of the DCP has been made, but is not a consent condition. The proposed activity may aim to fulfill these outcomes by avoiding remnant native vegetation where possible.	Section 6.5

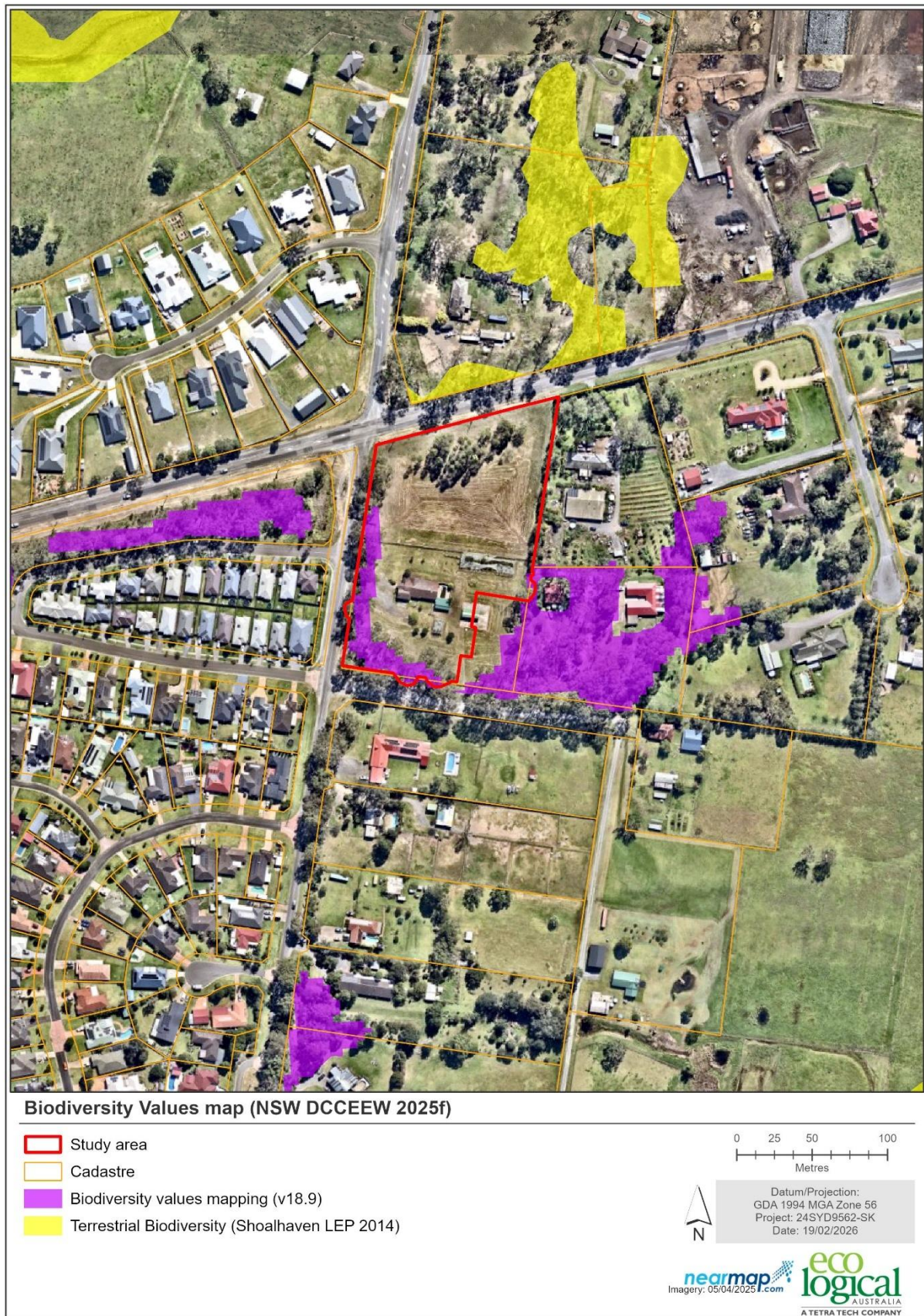


Figure 6: Biodiversity Values map (NSW DCCEEW 2026f) (last viewed 19 March 2026)

3. Methodology

3.1. Literature review

A review of readily available databases pertaining to the ecology and environmental features of the study area and surrounding area (within a 5 km radius of the study area), 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 BC Act (NSW DCCEEW 2026a)
- *Environment Protection and Biodiversity Conservation 1999* (EPBC) Act Protected Matters Search Tool (Protected Matters Search Tool – DCCEEW) for threatened and migratory species, populations and ecological communities listed under the Commonwealth EPBC Act (DCCEEW 2026a)
- NSW Threatened Species Profile Database (NSW DCCEEW 2026b).
- Atlas of Living Australia online database (ALA 2026).
- Previous vegetation mapping under the State Vegetation Type Map (SVTM) (NSW DCCEEW 2026c).
- PCT information under BioNet Vegetation Classification (NSW DCCEEW 2026d).
- National Flying-fox monitoring viewer for current known important Flying-fox camps (DCCEEW 2026c).
- Online soil profiles and mapping (eSpade) (NSW DCCEEW 2025e)
- Biodiversity Values mapping (BV map) (NSW DCCEEW 2026f)
- Relevant Geographic Information System (GIS) datasets including soils, geology and drainage.
- 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.
- New Primary School in Worrigee Arboricultural Impact Assessment (ELA 2026a)
- Review of relevant planning instruments, documentation, and information relating to biodiversity values and potential threatened species habitat.

3.2. Field survey

3.2.1. Initial site inspection

A field survey was conducted on 14 April 2025 by ELA ecologists Ali Jeffery and Kylie Lopes within 9 Worrigee Road, Worrigee. The site inspection was conducted to:

- Validate existing vegetation mapping (NSW DCCEEW 2026c) and determine the condition of vegetation communities present and presence of any threatened ecological communities.
- Identify habitat features for potential threatened flora and fauna species, including hollow-bearing trees, woody debris, and creek lines or habitat in man-made structures (i.e. crevices in roof cavities for microbats).

The field survey validated the boundaries of the vegetation using Arc GIS Field maps application. When habitat features were present, these were marked using a handheld GPS unit. Handheld GPS units were used to collect survey tracks during the field survey. It is noted that these units can have errors in accuracy of up to 20 m (subject to availability of satellites on the day).

3.2.2. Additional site inspection for the preschool within the broader site

An additional field survey was conducted on 12 February 2026 by ELA ecologist Hamish Pritchard. This inspection was surveyed to validate the vegetation along Booligal Road as part of the additional impacts which was not surveyed or assessed under the 2024 constraints assessment.

The field survey involved conducting a vegetation integrity plot to characterise the vegetation in the areas of PCT 3269 Shoalhaven Lowland Spotted Gum-Paperbark Forest in the site. This data was used to inform the final determination of whether it conformed to the EPBC Act TEC *Illawarra and south coast lowland forest and woodland ecological community* which is associated with PCT 3269.

Habitat assessments including identification of potential fauna habitat such as drainage lines and hollow-bearing trees were also conducted during the 2026 survey.

3.3. Limitations

The field assessment was not intended to provide an inventory of all species across the study area. Instead, it provides an overall assessment of the ecological values of the study area with emphasis on threatened species, endangered communities, and key fauna habitat features. It did not include any targeted flora and/or fauna surveys.

All area calculations have been based off the provided plans from the DoE to inform the study area boundaries.

4. Results of literature review

4.1. Soils and Hydrology

The study area is situated on the Shoalhaven soil landscape. The Shoalhaven soil landscape covers level to gently undulating floodplains on the Coastal Plain, and flat to gently undulating terrace surfaces of the Shoalhaven River. Prairie Soils occur on levees, Red Earths, Yellow Podzolic and Red Podzolic Soils on terraces, and Alluvial and Gleyed Podzolic Soils on floodplains (NSW DCCEEW 2026e).

The study area does not contain any mapped waterbodies. The nearest mapped waterbody is located more than 200 m directly west of the study area (Figure 3).

4.2. Review of desktop imagery

4.2.1. Historic aerial imagery

The review of historical imagery accessed via the NSW Historical Imagery viewer (Spatial Services 2025) indicates that the study area has undergone some clearing of vegetation over time. The earliest available historic aerial imagery shows that in 1970 the study area contained large areas of remnant vegetation (Figure 7). At this time, the surrounding landscape contained two roads, running north-south and east-west respectively, as well as some patches of potential remnant vegetation to the north and west of the study area. Past these patches, much of the remaining landscape was cleared of canopy vegetation, most likely for farming purposes. Some residential buildings and related infrastructure were present to the north-east and south-east of the study area.

Between 1970 and 2001, the study area remained largely undisturbed (Figure 10-Figure 10). There was some residential development and associated agricultural infrastructure established to the north and north-west outside of the study area during this period; however, these activities had minimal influence on canopy cover within the study area. There was greater change to the study area's surrounding landscape with the addition of a number of residential developments and associated roads.



Figure 7: 1970 aerial imagery (Spatial Services 2026)

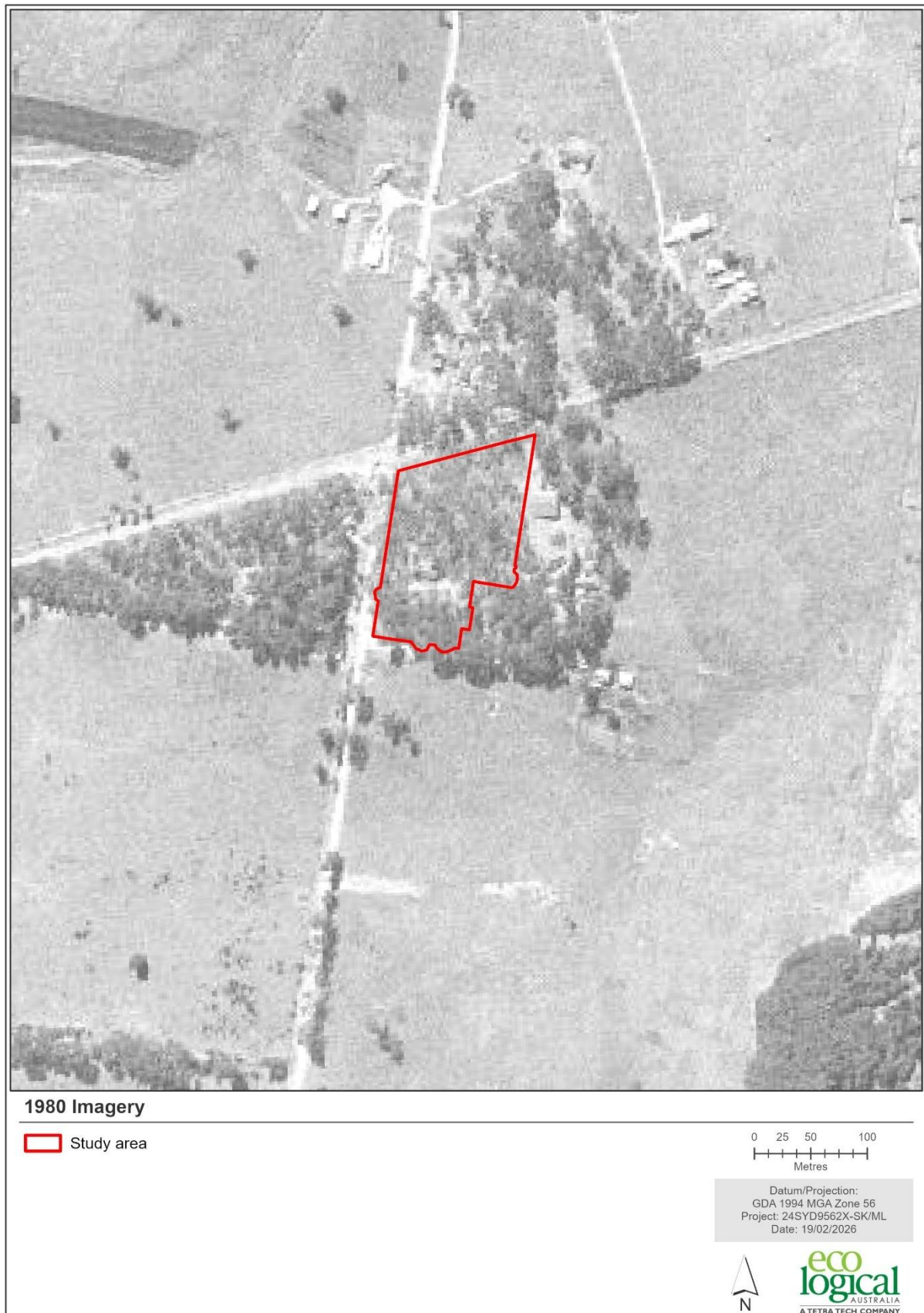


Figure 8: 1980 aerial imagery (Spatial Services 2026)



Figure 9: 1993 aerial imagery (Spatial Services 2026)



Figure 10: 2001 aerial imagery (Spatial Services 2026)

4.2.2. Current aerial imagery

A review of current aerial imagery, shown in Figure 3, indicates that the study area has undergone significant modification since 2001. The majority of vegetation present in imagery from 2001 has been cleared surrounding the study area. The intact canopy coverage within the study area occurs in the south-east corner and parallel to Booligal Road. The surrounding landscape has experienced continued modification with numerous new residential developments and associated roads.

4.3. Previous vegetation mapping

4.3.1. Biodiversity Values Map

The study area includes land mapped within the Biodiversity Values (BV) Map, located in the northern portion of the study area (Figure 6) (NSW DCCEEW 2026f) (last viewed 19 March 2026). Activities assessed under Part 5 are assessed differently and impacts to the BV map do not apply.

The study area does not contain land mapped on the Shoalhaven Local Environmental Plans 2014 riparian or terrestrial biodiversity layers (Figure 6).

4.3.2. Plant Community Types mapped within the study area

The desktop assessment reviewed the State Vegetation Type Mapping (SVTM) (NSW DCCEEW 2026c) to identify vegetation communities previously mapped across the study area.

One PCT had been previously mapped within the study area (Figure 11). This PCT was identified as PCT 3269 – Shoalhaven Lowland Spotted Gum-Paperbark Forest.

4.3.2.1. PCT 3269 – Shoalhaven Lowland Spotted Gum-Paperbark Forest

The BioNet Vegetation Information System (VIS) describes PCT 3269 as a very tall dry shrubby layered sclerophyll open forest with a mesophyll shrub layer with a grassy and herbaceous ground layer in clay rich soils in high rainfall districts of Sydney north shore (DCCEEW 2026d). The canopy almost always includes *Corymbia maculata* (spotted gum), often with *Eucalyptus longifolia* (woollybutt) and *E. paniculata* (grey ironbark) and commonly *E. globoidea* (white stringybark). The mid stratum contains an upper-layer with a sparse coverage of *Allocasuarina littoralis* (black she-oak) and *Melaleuca decora* (white feather honeymyrtle), and a sparse lower-layer frequently featuring *Daviesia ulicifolia* (gorse bitter pea) with *Pultenaea villosa* (bronze bush-pea), *Acacia falcata* (hickory wattle) and *Lissanthe strigosa* (peach heath) (NSW DCCEEW 2026d).

4.3.3. Plant Community Types in the broader landscape

A review of previous vegetation mapping outside of the study area was conducted to identify alternative PCTs that could also be present within the study area. In addition to PCT 3269 listed above, PCT 4049 – South Coast Floodplain Grassy Swamp Forest was identified occurring within 230 m of the study area (Figure 11).

4.3.3.1. PCT 4049 – South Coast Floodplain Grassy Swamp Forest

The BioNet VIS describes PCT 4049 as a tall open forest of low-lying slightly saline sites on coastal floodplain margins and headland soaks of the southern Sydney Basin and northern South East Corner bioregions (NSW DCCEEW 2026d). A mid-dense to dense tree canopy is dominated by *Casuarina glauca* (swamp oak), occasionally with *E. longifolia*, with a lower stratum of scattered trees with occasional *Melaleuca ericifolia* (swamp paperbark) or *M. linariifolia* (flax-leaved paperbark). The smaller shrub layer very frequently includes *Pittosporum undulatum* (native daphne), with *Leucopogon juniperinus* (prickly beard-heath) common and *Kunzea ambigua* (tick bush) also occasionally present (NSW DCCEEW 2026d).



Figure 11: Previous vegetation mapping (DCCEW 2024c)

4.4. Threatened ecological communities

The desktop review identified PCT 3269 previously mapped within the study area (Figure 11).

PCT 3269 can be associated with the *Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion* threatened ecological communities (TEC), listed as endangered under the BC Act (NSW DCCEEW 2026d). It can also be associated with *Illawarra and south coast lowland forest and woodland ecological community*, which is listed as a critically endangered ecological community (CEEC) under the EPBC Act (NSW DCCEEW 2026d). Field surveys were conducted to determine if PCT 3269 was present and satisfied the criteria for listing under the BC Act or EPBC Act.

4.5. Flora species

The Atlas of Living Australia (ALA) identified 1,432 flora species recorded within a 5 km radius of the study area (ALA 2026). This includes exotic species, native flora species and threatened species. No threatened flora species have previously been recorded on ALA within the study area.

4.5.1. Threatened flora species

A search for threatened flora species using the Protected Matters Search Tool (PMST) and NSW Atlas of Wildlife returned a list of 30 threatened flora species that are either known, likely or potentially occurring within a 5 km radius of the study area (Figure 12)

There have been no threatened flora species previously recorded in BioNet within the study area. It should be noted that the result of the PMST is a list of species based on habitat modelling rather than field observations. As such, only eight (8) species are captured in Figure 12.

No targeted flora surveys were conducted during the field surveys as the habitat is degraded and fragmented from patches of intact native vegetation. There are very limited threatened flora records recorded within a 5 km radius of the study area. These records are predominantly from more intact patches of native vegetation to the far west of the study area. Furthermore, due to historical clearing of vegetation and ongoing slashing of the midstorey and groundlayer it is highly unlikely that threatened flora species would persist in the soil seed bank within the study area.

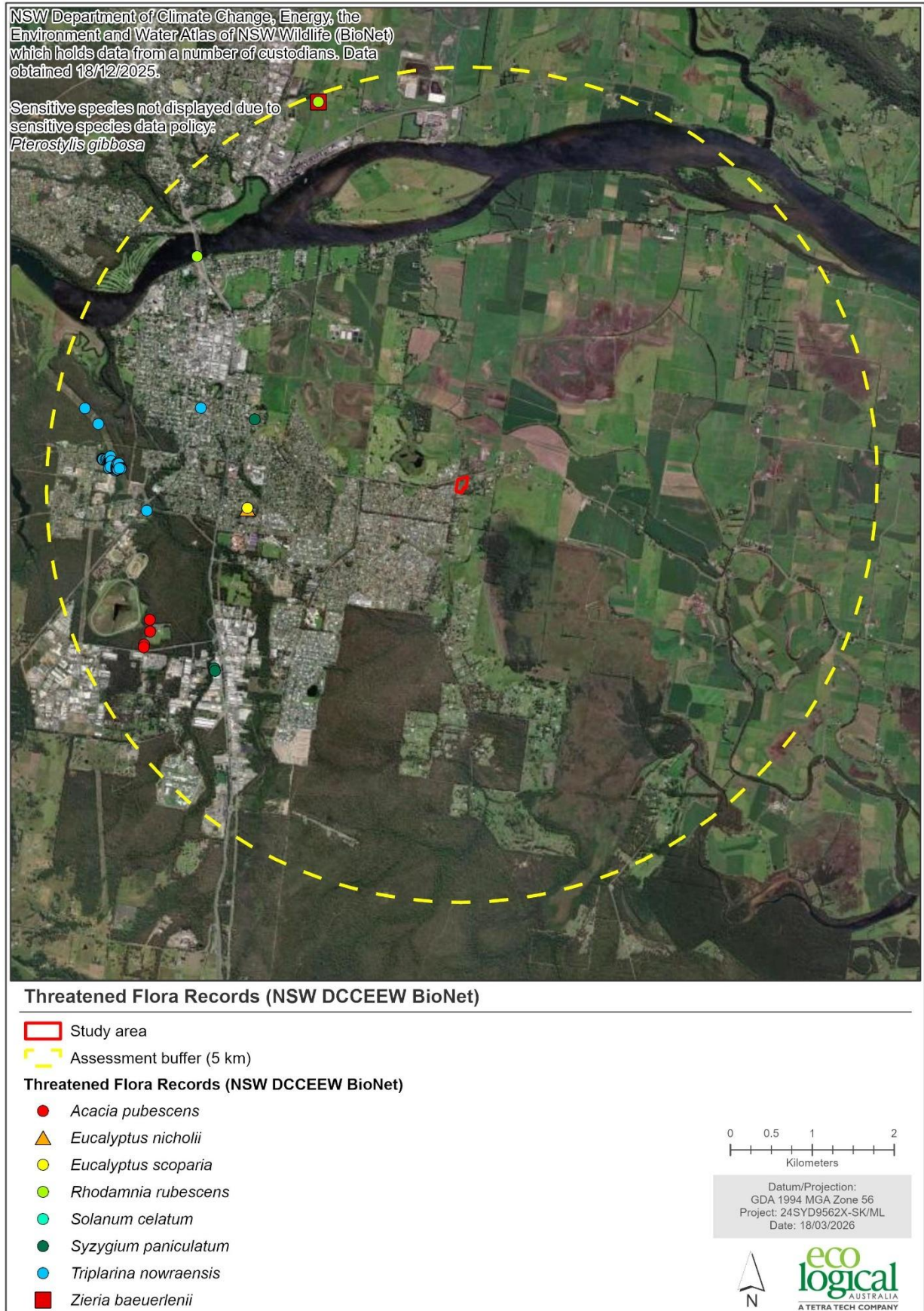


Figure 12: Threatened flora species records within 5 km radius of the study area (NSW DCCEEW 2025a)

4.6. Fauna species

The ALA identified 875 fauna species previously recorded within a 5 km radius of the study area (ALA 2026). This includes exotic species, native fauna species and threatened species. No threatened fauna species have previously been recorded on ALA within the study area.

4.6.1. Threatened fauna species

A search for threatened fauna species using the PMST, NSW Atlas of Wildlife (BioNet) and the review of literature returned a list of 61 threatened and migratory fauna species either known, likely or predicted to occur within 5 km of the study area (Figure 13).

There have been no threatened fauna species previously recorded in BioNet within the study area. It should be noted that the result of the PMST is a list of species based on habitat modelling rather than field observations. As such, only 50 species are captured in Figure 13.

Due to the potential of native vegetation occurring with the study area, and remnant vegetation existing to the south-east of the study area, there is potential that mobile threatened fauna species may utilise the vegetation within the study area on occasion.

Threatened species with a high number of records within 5 km of the study area included:

- *Pteropus poliocephalus* (grey-headed flying-fox) – 2,378 records
- *Calyptorhynchus lathami lathami* (south-eastern glossy black-cockatoo) – 68 records
- *Litoria aurea* (green and golden bell frog) – 543 records.

Grey-headed flying-fox prefer to forage on the blossoms and fruit of myrtaceous species such as *Eucalyptus*, *Corymbia* and *Angophora*, as well as that of *Ficus* spp. (NSW DCCEEW 2025b). The closest Nationally Important camp for grey-headed flying-fox occurs approximately 4.8 km to the north-west of the study area (DCCEEW 2025c).

South-eastern glossy black-cockatoo are found in open forest and woodland habitats in coastal areas, where strands of *Allocasuarina* occur. It feeds almost exclusively on the seeds of *Allocasuarina* and *Casuarina* species. These species are dependent on large hollow-bearing Eucalypts with entrance >15 cm for breeding habitat (NSW DCCEEW 2025b).

Green and golden bell frog inhabit marshes, dam and stream-sides. They particularly associate with habitats containing *Typha* or *Eleocharis* species. Feed predominantly on invertebrates but may also prey on other frogs. Breeds in summer when conditions are warm and wet (NSW DCCEEW 2025b).

A field survey was conducted to verify the presence or absence of habitat for the predicted threatened species.

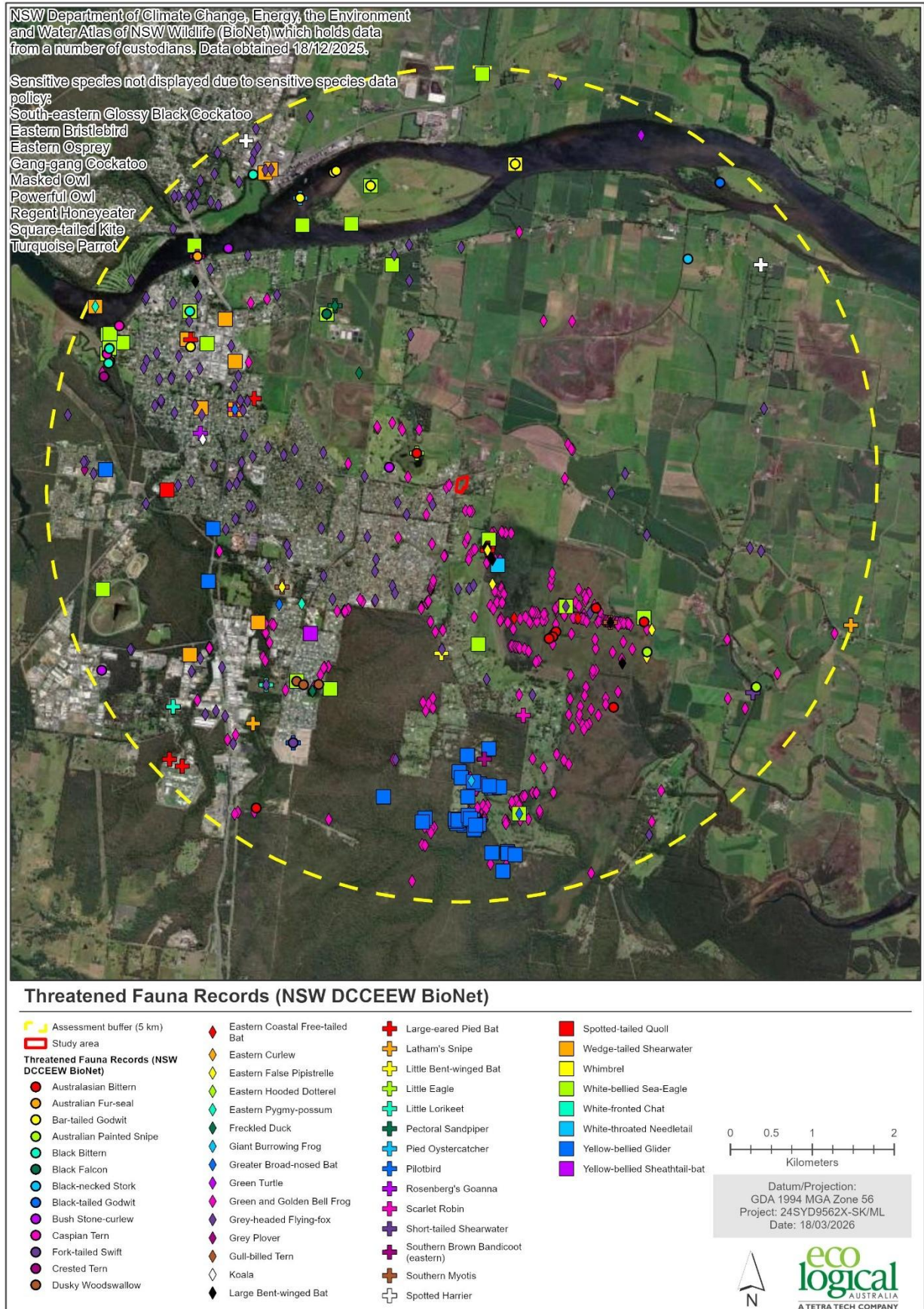


Figure 13: Threatened fauna species records within 5 km radius of the study area (NSW DCCEEW 2025a)

5. Field Results

5.1. Vegetation communities

The field survey confirmed the presence of remnant native vegetation in the form of PCT 3269 – Shoalhaven Lowland Spotted Gum-Paperbark Forest was mapped within the study area as degraded (Figure 14). This PCT 3269 condition was represented by a native canopy and slashed ground layer. The midstorey was absent.

A second vegetation zone (PCT 3269 low condition) was mapped outside of the study area. This vegetation zone was mapped along the northern border of Booligal Road within the site, around the preschool area. PCT 3269 low condition vegetation contains an some native midstorey and native groundcover species and high density of weeds. No impacts will occur to PCT 3269 low condition, so this vegetation zone is not discussed further in this report.

The remaining zones identified within the study area included mixed planted native/exotic vegetation, exotic grass and cleared building/hardstand areas. The planted native vegetation in the study area did not conform to a PCT. A description of each of the vegetation zones is provided in the following section.

Validated vegetation from the field surveys is listed in Table 3 and displayed in Figure 14.

Table 3: Validated vegetation recorded within the study area

PCT ID	PCT name	Condition	Study area (ha)
3269	Shoalhaven Lowland Spotted Gum-Paperbark Forest	Degraded	0.43
-	Planted native/exotic vegetation	Planted	0.10
-	Exotic grass	Exotic	1.20
-	Cleared (built)	Cleared	0.07
Total			1.80

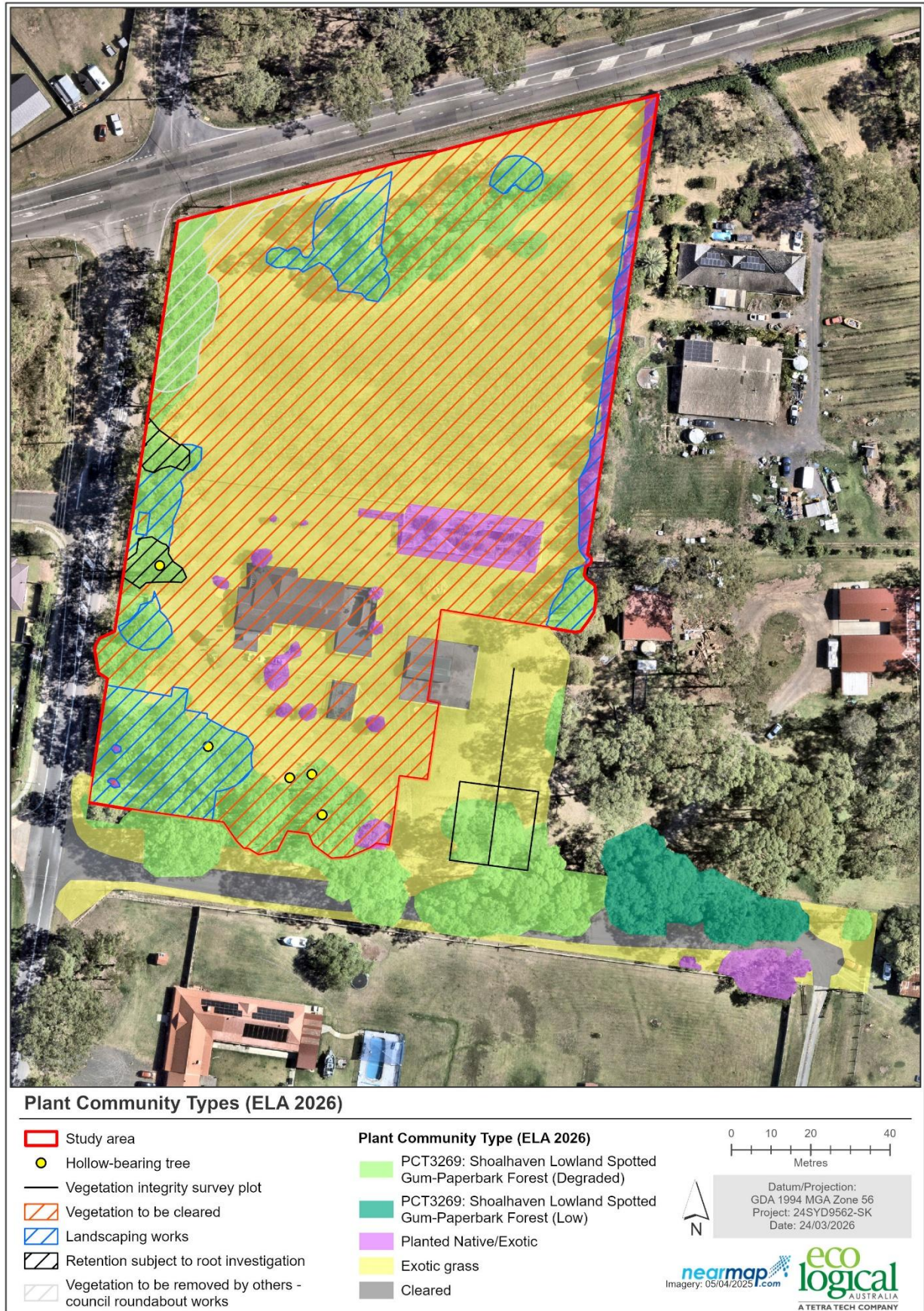


Figure 14: Validated vegetation and habitat features (ELA 2026)

5.1.1. PCT 3269 Shoalhaven Lowland Spotted Gum-Paperbark Forest – degraded condition

PCT 3269 in degraded condition was identified throughout the study area (Figure 15). There was approximately 0.43 ha of PCT 3269 mapped in degraded condition in the study area. These areas contained a remnant canopy of *Corymbia maculata* (Figure 15) with no midstorey or regenerating canopy species.

Ground layer was regularly slashed. It featured a mix of native and exotic species; however exotic coverage was higher than native. Exotic species with the highest coverage included *Eragrostis curvula* (African love grass), *Sporobolus africanus* (Parramatta grass), *Axonopus fissifolius* (narrow-leafed carpet grass), *Paspalum dilatatum* (paspalum), *Cenchrus clandestinus* (kikuyu) and *Setaria parviflora*. Native ground cover species include *Cynodon dactylon* (couch), *Poa sieberiana*, *Eragrostis brownii* (Brown's lovegrass) and *Rytidosperma tenuis*.



Figure 15: PCT 3269 (degraded condition) within the study area.

5.1.2. Planted native/exotic vegetation

The study area also contains patches of planted native/exotic vegetation which has been planted for aesthetic or horticultural purposes (Figure 16). This accounted for approximately 0.10 ha of the study area. These were determined to be planted due to either the positioning in the landscape, the composition of species, or species being non-indigenous to the bioregion the study area occurs in. Shrub species included were identified occurring in this veg zone. Mid-storey species included *Syagrus romanzoffiana* (cocos palm), *Malus domestica* (apple), *Passiflora morifolia*, *Citrus x limon* (lemon), *Ficus* sp. (fig) and *Pinus* sp. (pine). Ground cover in these patches comprised of predominantly exotic species including *C. clandestinus*, *P. dilatatum* and *A. fissifolius*.



Figure 16: Planted native/exotic vegetation occurring within an orchid on the property adjacent to the study area.

5.1.3. Exotic grass

The study area contained large areas of exotic grasses, attributing to 1.2 ha of the study area (Figure 17). These areas were regularly maintained through mowing and did not contain any upper or mid-storey species. Exotic grass species observed included *C. clandestinus*, *E. curvula*, *P. dilatatum* and *A. fissifolius*.



Figure 17: Exotic grass within the study area

5.2. Threatened ecological communities

According to the BioNet Vegetation Classification PCT 3269 has threatened ecological community associations:

- *Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion*, which is listed as endangered ecological community under the BC Act.
- *Illawarra and south coast lowland forest and woodland ecological community*, which is listed as critically endangered ecological community under the EPBC Act.

An assessment to determine if the patches of PCT 3269 (in low or degraded condition) mapped within the study area satisfied the listing criteria under the BC Act or EPBC Act is provided below.

5.2.1. BC Act listing criteria

Paragraph 1 of the final determination for *Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion* states the following (NSW Scientific Committee 2011):

- The Illawarra Lowlands Grassy Woodland is the name given to the plant community from the local government areas of Wollongong City, Shellharbour City, and Kiama Municipality.

The study area is located within Shoalhaven local government area which occurs south of the above listed areas. According to paragraph 1 of the final determination, the patch of PCT 3269 mapped within the study area does not conform to the TEC *Illawarra Lowlands Grassy Woodlands in the Sydney Basin Bioregion* as it does not occur in the listed local government area. Therefore, the PCT 3269 does not represent part of a TEC listing under the BC Act.

5.2.2. EPBC Act listing criteria

Additionally, PCT 3269 is also associated with the EPBC Act TEC *Illawarra and south coast lowland forest and woodland ecological community*, which is listed as critically endangered ecological community. The EPBC Act recognises larger patches of native vegetation and has more stringent criteria for listings.

The field plot results (Appendix D) was compared with the EPBC Act conservation advice for the TEC, provided below (Table 4). The vegetation patch, based on the ELA validated vegetation and existing mapping STVM, was mapped less than 2 ha in size. The plot data determined that the native midstorey cover was 4% and understorey cover represented approximately 6 %.

Therefore, in accordance with the EPBC Act threshold in Table 4 the PCT 3269 (both low and degraded) within the study area did not meet the listing criteria for this TEC due to having less than 30 % native perennial ground cover species within the patch.

Table 4: Condition thresholds for patches of *Illawarra and south coast lowland forest* in the EPBC Act

Category and rationale	Patch size thresholds	Biotic thresholds		
A. High condition class <i>A larger patch with good quality native understorey and/or many very large trees</i>	The patch is at least 2 ha.	50% of its total understorey vegetation cover* is comprised of native species (exotic annuals are excluded from this assessment)		
		and		
		At least 6 native plant species per 0.5 ha in the ground layer	OR	the patch has at least ten trees that are either very large (at least 60cm diameter at breast height dbh) or have hollows.
B. High condition class <i>A patch with very good quality native understorey with a species rich ground layer</i>	The patch is at least 0.5 ha.	At least 70% of the understorey vegetation cover* is comprised of native species (exotic annuals are excluded from this assessment)		
		and		
		with at least 10 native plant species per 0.5 ha in the ground layer		
C. Moderate condition class <i>A patch with good quality native understorey</i>	The patch is at least 0.5 ha.	At least 50% of its total understorey vegetation cover* is comprised of native species (exotic annuals are excluded from this assessment)		
		and		
		with at least 6 native plant species per 0.5 ha in the ground layer		
D. Moderate condition class <i>A patch that makes other important ecological contributions</i>	The patch is at least 0.5 ha.	At least 30% of total perennial understorey vegetative cover* is comprised of native species		
		and		
		the patch is contiguous** with another patch of native vegetation *** (at least 1 ha in area)	OR	the patch has at least one large locally indigenous tree (at least 50 cm diameter at breast height (dbh)), or at least one tree with hollows
*Understorey vegetation cover includes vascular plant species of both the ground layer and the shrub layer (where present). The ground layer includes herbs (graminoids and forbs) and low (≤ 0.5 m) shrubs, but does not include cryptogams, leaf litter or exposed soil. **Contiguous with another patch of native vegetation means the patch is continuous with or in close proximity (within 100 m) to another area of native vegetation. ***'Native vegetation' refers to areas where $\geq 50\%$ of the perennial vegetation cover is comprised of native plant species.				

5.3. Flora species and habitat

No threatened flora species were opportunistically identified within the study area during the field survey effort. Due to the high levels of disturbance and regular maintenance occurring within the study area, it is considered highly unlikely that threatened species would occur within any of the present vegetation.

5.4. Fauna species and habitat

No threatened fauna species were opportunistically identified within study area during field survey. Habitat features present within the study area are presented in Table 5.

Five hollow bearing trees were identified within the study area (Figure 14), an example is shown in Figure 18. These hollows ranged in size from <5 cm to 20 cm and have the potential to provide habitat for a wide variety of native species, including non-threatened species such as reptiles, amphibians, birds and arboreal mammals and threatened birds and microbat species. At the time of the 2026 surveys non-threatened bird species *Cacatua sanguinea* (little corella) were observed utilising some of the hollows.

Tree roosting microbats such as *Falsistrellus tasmaniensis* (eastern false pipistrelle), *Micronomus norfolkensis* (coastal free-tailed bat) and *Saccolaimus flaviventris* (yellow-bellied sheath-tail bat), may utilise the trees with hollows <5 cm or 5-10 cm recorded within the study area. These threatened microbat species which have previously all been recorded within a 5 km radius of the study area.

One hollow which had an entrance range of 15-20 cm and may provide breeding habitat for large species such as the glossy black cockatoo. There are 68 BioNet records for this species within 5 km radius of the study area. Therefore, although the vegetation within the study area is in low condition (due to absence of native shrub and ground cover species) and is disconnected from large intact patches, there is potential that this species may utilise the hollows during breeding season if other available resources are in limited supply. The field surveys did not record the presence of suitable foraging habitat for this species in the form of *Allocasuarina* or *Casuarina* species. However, due to the significant number of BioNet records for this species and presence of a hollow within the suitable size class for the glossy black cockatoo there is potential this species may utilise the hollow.

Threatened birds, such as gang-gang cockatoo as well as mammal, grey-headed flying-fox, may also use some of the vegetation (PCT 3269, and planted native/exotic) in the study area for occasional foraging. The vegetation contains nectar flowering and winter flowering tree species *C. maculata*, which are an important foraging resources for both species during winter (DAWE 2022).

The study area may provide foraging habitat for threatened microbat species above and amongst the native vegetation canopy. As the vegetation within the study area is only a small patch, this foraging resource would form only part of the threatened species foraging habitat.

The field results identified a small drainage depression along Booligal Road in the broader site (associated with the preschool site). This area was identified to provide potential non-breeding habitat for green and golden bell frog. The drainage depression contained *Cyperus* species, which is not ideal habitat for this species, however, it may provide occasional sheltering habitat. The field survey did not record potential habitat for this species within the study area. No breeding habitat was recorded within the study area or broader site. Therefore, no additional consideration of the green and golden bell frog was considered for this assessment.

Tests of significances have been prepared for species which are likely to be impacted by the proposed activity. These are provided in Section 6 below.

Table 5: Habitat features recorded in the study area

Habitat feature	Associated species	Presence
Large expanse of native vegetation	Birds, microchiropteran bats (microbats), megachiropteran bats (fruit bats), arboreal mammals, reptiles	Absent within the study area or surrounding area.
Nectar producing species	Arboreal mammals/birds and fruit bats	Present: <i>Corymbia maculata</i> .
Hollow-bearing trees	Microbats, birds, mammals, amphibians, reptile	Present – five in total
Coarse woody debris (fallen logs)	Terrestrial mammals, reptiles, invertebrates	Absent
Leaf litter	Reptiles, amphibians, invertebrates	Regular maintenance has resulted in there being marginal leaf litter habitat.
Water body	Amphibians, reptiles, microbats	Absent
Rocky outcrops	Reptiles	Absent
Mistletoe	Arboreal mammals/birds and fruit bats	One small patch
Winter flowering species	Winter migratory birds, arboreal mammals and megachiropteran bats (fruit bats)	Present: <i>Corymbia maculata</i> .
Termite mound	Goannas, echidnas	Absent

**Figure 18: A hollow bearing tree (tree 1), with several hollows in the study area that could potentially provide habitat for threatened microbats and birds. This tree is subject to root mapping and be retained if possible, in the study area**

6. Impact Assessment

6.1. 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).

Assessments were conducted for those species listed under the BC Act considered likely or known to use habitat within the study area, after considering both the desktop review and results from the field survey, including:

- *Calyptorhynchus lathami lathami* (south-eastern glossy black cockatoo)
- *Callocephalon fimbriatum* (gang-gang cockatoo)
- *Pteropus poliocephalus* (grey-headed flying fox)
- Microchiropteran bats:
 - *Micronomus norfolkensis* (eastern coastal free-tailed bat)
 - *Falsistrellus tasmaniensis* (eastern false pipistrelle)
 - *Saccolaimus flaviventris* (yellow-bellied sheath-tail bat)
 - *Scoteanax rueppellii* (greater broad-nosed bat)

Other highly mobile threatened species which are wide-ranging and dispersive may still utilise the study area on occasion for foraging. The 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.

A Significance Assessment under the EPBC Act was required threatened species under the EPBC Act, for grey-headed flying fox, south-eastern glossy black cockatoo and gang-gang cockatoo. These concluded that the proposed activity was unlikely to result in a significant impact on these species. No PCTs listed as a TEC were present within the study area, therefore an Assessment of Significance under the EPBC Act and a Test of Significance under the BC Act was not required for the vegetation present within the study area.

6.2. Direct Impacts

Direct impacts during the construction phase and long-term impacts post construction have been considered for the impact assessment. The proposed activity will result in the direct removal of 0.17 ha of all structural layers of PCT 3269 within the development footprint. Two additional trees (tree #1 and 64) (0.02 ha of PCT 3269) require root mapping to determine if the trees can be retained within the study area. This is subject to additional investigation as per the AIA (ELA 2026a). However, for the purpose of calculating the direct impacts a worse-case scenario has been applied and assumed both trees may be removed. Therefore, as a worse-case scenario a total of 0.19 ha of PCT 3269 may be directly removed for the purpose activity.

The proposed activity also involves landscaping works will retain the canopy but limit the regeneration of PCT 3269 and future canopy recruitment which therefore limits future foraging and breeding

resources of threatened species. 0.19 ha of PCT 3269 will be retained as canopy but subject to landscaping works. This is considered a partial impact to this PCT and included in this assessment.

The 0.05 ha of PCT 3269 subject to Council works are not included in this report as the works will be assessed under a different assessment.

PCT 3269 does not represent part of a TEC but does provide foraging and breeding habitat for threatened fauna species.

A summary of the potential direct impacts has been provided in Table 6 and shown in Figure 19.

Table 6: Summary of potential impacts to vegetation in study area and fauna habitat

Vegetation Community	Total in study area (ha)	Direct impact (ha)	Landscaping (canopy retained)	Council roundabout works**
PCT 3269: Shoalhaven Lowland Spotted Gum-Paperbark Forest – degraded	0.43	0.19*	0.19	0.05
Planted native / exotic	0.10	0.08	0.02	0
Exotic grass	1.20	1.17	0.02	0.01
Cleared (built)	0.07	0.07	0	0
TOTAL	1.80	1.51	0.23	0.06

*includes 0.02 ha which is subject to root investigation and trees 1 and 64 maybe retained if possible

**The Council roundabout works are not part of this proposed activity and will be subject to a different Council assessment



Figure 19:Trees impacted by the proposed activity (ELA AIA 2026)

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

- removal of native vegetation which conforms to a PCT
- removal of planted native and exotic vegetation which does not conform to a PCT
- loss of nesting habitat (four hollow-bearing trees)
- loss of habitat for threatened species
 - potential foraging habitat for threatened fauna (grey-headed flying fox and cockatoos)
 - potential loss of nesting habitat through removal of HOLLOW-BEARING TREES for microbats and birds.

6.2.1. Removal of native vegetation

The proposed activity will affect up to 0.19 ha of PCT 3269 (in low and degraded condition) within the study area. The vegetation does not represent part a TEC listed under the BC Act or EPBC Act. Therefore, Test of Significance under the BC Act or Assessments of Significance under the EPBC Act were not required for the removal of native vegetation.

6.2.2. Removal of potential habitat for threatened fauna species

Approximately 0.19 ha of marginal foraging habitat (PCT 3269) for *Pteropus poliocephalus* (grey-headed flying-fox and gang-gang cockatoo) and four hollow-bearing trees for microbat and bird species would be removed. One tree (tree 1) with multiple hollows including a hollow entrance 15 – 20 cm maybe retained, subject to root mapping investigation. However, for the purpose of this assessment, it has been assumed this tree will be removed. One hollow-bearing tree will be retained in the landscaping area and will not be impacted by landscaping works.

There was no other habitat for threatened species identified (i.e. caves or culverts) within the study area which would be impacted by the proposed activity.

It is noted that some other threatened fauna species may utilise the study area intermittently as marginal foraging habitat. However, due to the highly mobile nature of these species and availability of foraging habitat in the adjacent landscape, no Tests of Significance were considered necessary for these species.

6.2.3. Ground layer disturbance

Approximately 0.19 ha of PCT 3269 (degraded) is subject to landscaping impacts, including soil disturbance from the establishment of pathways, playgrounds and establishment of gardens. This will impact on the seeds stored in the soil profile and the recruitment of canopy species. Although the native canopy will remain intact, the landscaping works may prevent future regeneration of canopy species for threatened species. Therefore, foraging habitat will be retained, however, future foraging resources for threatened species may be reduced.

At the time of the field assessment, the ground layer was regularly slashed and consisted largely of exotic grasses, such as *Eragrostis curvula* (African love grass) and *Sporobolus africanus* (Parramatta grass).

6.3. Cumulative Impacts

An assessment of the cumulative impacts was prepared to consider the impacts of the combined New Primary School and Preschool. A total of 46 trees will be removed for the primary school (0.19 ha) and 61 trees will be removed for the preschool (0.31 ha). Therefore, the total cumulative impact is the removal of 107 trees or 0.5 ha of native vegetation (Table 7).

Table 7: Cumulative impacts

Activity	Direct impact area (ha)	Number of trees removed
Primary school	0.19	46
Preschool	0.31	61
Total	0.5	107

There are no published guidelines or thresholds for cumulative impacts for REFs, therefore, the Test of Significance guidelines (OEH 2018) were considered when assessing whether this impact is significant.

A Test of Significance was conducted for PCT 3269 which is not a TEC to determine if the cumulative impacts would be a significant impact on ecological communities. It was determined that the combined preschool and primary school would not result in a significant impact.

Table 8: Test of Significance under the BC Act to determine if the cumulative impacts is significant

BC Act	Question	Response
7.3.1(a)	In the case of a threatened species: whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	N/A
7.3.1(b) (i)	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	The cumulative impacts will result in the removal of 0.5 ha of PCT 3269 which is not an endangered or critically endangered ecological community. The STVM has mapped a 1.5 ha patch of the same ecological community (PCT 3269) connected to the study area in the east, and a second patch of 0.8 ha in the west. Therefore, the vegetation will not be placed at risk of extinction.
7.3.1(b) (ii)	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	The cumulative impacts will result in modification of PCT 3269 which is not an endangered or critically endangered ecological community. As described above, 0.5 ha of PCT 3269 will be directly removed for the cumulative impacts and 0.19 ha of PCT 3269 will be disturbed due to landscaping works (however, the canopy will be retained). This activity will not place the vegetation community at risk of extinction as the adjacent patch of 1.5 ha will be retained and an additional 0.8 ha adjacent to the west of the study area will also be retained.
7.3.1(c) (i)	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be	0.5 ha of PCT 3269 which is not a TEC will be directly impacted by the combined preschool and public school activity. This includes removal of the existing native canopy, shrub (if any)

BC Act	Question	Response
	removed or modified as a result of the proposed development or activity	and ground cover. An additional 0.19 ha will be modified due to landscaping changes, however, the canopy will be retained.
7.3.1(c) (ii)	In relation to the habitat of a threatened species or ecological community: Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity	The cumulative impact is not likely to significantly reduce the connectivity of the landscape a singular patch of vegetation will be removed. A patch of vegetation (1.5 ha) immediately adjacent to the study area and connected to the vegetation within it will be retained and maintains connectivity across the broader landscape. The activity will not fragment the vegetation in the landscape.
7.3.1(c) (iii)	In relation to the habitat of a threatened species or ecological community: The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	The vegetation is in a degraded condition with limited native vegetation in the mid or ground layers. The vegetation does not represent part of a TEC and there are no records of threatened species utilising the vegetation.
7.3.1(d)	Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The activity would not impact any declared Areas of Outstanding Biodiversity Value.
7.3.1(e)	Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The activity is associated with the KTPs: • <i>Clearing of native vegetation</i> • <i>loss of hollow-bearing trees.</i>
Conclusion	Is there likely to be a significant impact?	No, for the reasons provided above.

The field surveys identified PCT 3269 in a low or degraded nature which is subject to ongoing mowing which has removed native ground cover and shrubs. The AIA (ELA 2026a) notes that several of the trees proposed for removal are in fair health. Replacement plantings at a ratio of 1:1 is required for the proposed activity as per the AIA (ELA 2026a). These plantings should include representative species of PCT 3269.

6.3.1. Cumulative fauna habitat impacts

An assessment of the cumulative impacts through the loss of foraging habitat, connectivity and hollow-bearing trees was also undertaken. The cumulative impacts to threatened microbat species and grey-headed flying-fox, which are likely to forage within the study area (see Appendix A), include the removal of 0.19 ha of PCT 3269 for the New Primary School and 0.31 ha for the recently approved New Public Preschool (ELA 2026b), resulting in a total removal of 0.5 ha of PCT 3269.

The New Public Preschool activity also includes the removal of six trees with suitable hollows for microbats to potentially roost in (ELA 2026b). Alongside the four suitable hollows being removed for the New Primary School activity, this will result in a cumulative impact of ten hollows being removed which provide potential microbat roosting habitat.

The cumulative impacts to hollow-dependent birds which are likely to roost and/or forage within the study area (see Appendix A) include the removal of 0.19 ha of PCT 3269 for the New Primary School and

0.31 ha for the recently approved New Public Preschool (ELA 2026b), resulting in a total removal of 0.5 ha of PCT 3269. ELA (2026b) did not identify any hollows suitable for these species within the footprint for the New Public Preschool. As a part of the New Primary School activity, one suitable hollow will be removed which offers potential roosting habitat for these species.

The cumulative impacts of the New Primary School and New Public Preschool have been considered in the Tests of Significance and Assessments of Significance for these BC Act and EPBC Act listed threatened fauna, respectively (Appendix B and Appendix C).

6.4. 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 '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. The study area is not located on or near a declared area of outstanding biodiversity value.

For a Part 5 assessment, if the conclusion of the assessments 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, or a Biodiversity Development Assessment Report. The test of significance is used to determine if the development is likely to have a significant impact on any threatened species, population or ecological community. If a significant impact is indicated by the test of significance, then the proposal would trigger the Biodiversity Offsets Scheme (BOS), and a Biodiversity Assessment Method 2020 (BAM) assessment is required. A Test of significance was conducted for the following species listed under the BC Act (Appendix B):

- *Pteropus poliocephalus* (grey-headed flying fox)
- Microchiropteran bats:
 - *Micronomus norfolkensis* (eastern coastal free-tailed bat)
 - *Falsistrellus tasmaniensis* (eastern false pipistrelle)
 - *Saccolaimus flaviventris* (yellow-bellied sheath-tail bat)
 - *Scoteanax rueppellii* (greater broad-nosed Bat)
- *Calyptorhynchus lathami lathami* (Glossy Black Cockatoo)
- *Callocephalon fimbriatum* (Gang-gang cockatoo).

The outcome of the tests concluded that the works are unlikely to result in a significant impact upon threatened species. Therefore, a SIS or BDAR is not required for the proposed activity.

6.4.1. 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 (including PCT 3269) under the BC Act / Land clearance under the EPBC Act
- loss of tree hollows under the BC Act.

6.5. Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

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

Three nationally threatened fauna species, grey-headed flying-fox, south-eastern glossy black cockatoo and gang-gang cockatoo, may utilise the native canopy vegetation within the study area as foraging or breeding habitat. An Assessment of Significance under the EPBC Act was prepared for these three MNES (Appendix C). The outcome of the tests concluded that the works are unlikely to result in a significant impact upon threatened species, therefore a SIS and a referral is not required.

6.6. Shoalhaven Local Environment Plan 2014 (Shoalhaven LEP)

The Shoalhaven Local Environmental Plan 2014 (LEP) relates to development applications assessed under Part 4 of the EP&A Act. The proposed activity will be assessed under Part 5 REF; therefore, the activity does not require assessment under the LEP. However, as part of a thorough review of the environmental provisions for the activity, the LEP was reviewed, although the activity is not bound to the LEP.

The Shoalhaven LEP, Parts 2 and 7.5 was reviewed for this FFA, which contains considerations for biodiversity and zoning (Table 9). In relation to Part 2, the study area is zoned R5 Large Lot Residential under the Shoalhaven LEP. Under the LEP, school infrastructure is permissible in R5 zoning. The study area does not contain land mapped on the Shoalhaven LEP Terrestrial Biodiversity layer. The proposed activity is consistent with Part 2 and 7.5 of the Shoalhaven LEP.

Table 9: Shoalhaven Local Environmental Plan 2014 relevant biodiversity and zoning clauses

Part number	Relevant content of clause
Part 2	1 Objectives of zone • To provide residential housing in a rural setting while preserving, and minimising impacts on, environmentally sensitive locations and scenic quality. • To ensure that large residential lots do not hinder the proper and orderly development of urban areas in the future. • To ensure that development in the area does not unreasonably increase the demand for public services or public facilities. • To minimise conflict between land uses within this zone and land uses within adjoining zones. 2 Permitted without consent Home occupations 3 Permitted with consent Bed and breakfast accommodation; Building identification signs; Business identification signs; Community facilities; Dual occupancies (attached); Dwelling houses; Emergency services facilities;

Part number	Relevant content of clause
	Environmental facilities; Environmental protection works; Exhibition homes; Extensive agriculture; Group homes (transitional); Home-based child care; Home businesses; Home industries; Horticulture; Neighbourhood shops; Recreation areas; Roads; Sewerage systems; Water supply systems
4 Prohibited	Any development not specified in item 2 or 3
Part 7.5	Terrestrial biodiversity
	(1) The objective of this clause is to maintain terrestrial biodiversity, by: (a) protecting native fauna and flora, (b) protecting the ecological processes necessary for their continued existence, and (c) encouraging the conservation and recovery of native fauna and flora and their habitats.

6.7. Shoalhaven Development Control Plan 2014 (Shoalhaven DCP)

This FFA has reviewed the provisions of the Shoalhaven Development Control Plan (DCP) 2014 and identified that Chapter G5 contains provisions relating to biodiversity. As per the LEP, the REF does not require assessment by local council for the proposed activity, therefore, the DCP was reviewed for good merit only.

Chapter G5 details Biodiversity Impact Assessment. Objectives of the chapter were:

- Protect threatened species, populations and TECs against direct and indirect impacts generated by development.
- Ensure that developments which have the potential to impact upon threatened species, populations or TECs are assessed in accordance with legislative requirements.

This FFA has considered the provisions of the DCP and determined that the activity is unlikely to result in a significant impact to threatened species or TECs. Impacts to these biodiversity values have been avoided where possible. No other consideration of the DCP is required for this activity.

7. Mitigation Measures

To mitigate impacts to waterways, PCTs and threatened species and their habitat within the development stages (prior/during/after construction), the following general mitigation measures are provided in Table 10. Tree protection fencing is established around any proposed trees to be retained within the vicinity of the proposed buildings as per the Arboricultural Impact Assessment (ELA 2026a).

Table 10: Mitigation measures

ID	MM name	Mitigation measure	Timing
Ecology			
E1	Tree protection	Trees not approved to be pruned or removed are to be protected and maintained in accordance with AS 4970-2009 Protection of Trees on Development Sites. Tree protection must be approved by a Consulting Arborist AQF Level 5. Protections are to remain in place until the completion of all construction work in the vicinity of the protected trees. Refer to AIA (ELA 2026).	During construction
E2	Tree Removal or Pruning	Tree pruning or removal is to be carried out by an Arborist with a minimum AQF Level 3 qualification in Arboriculture. Any tree pruning must be in accordance AS 4373-2007 Pruning of amenity of Trees. Immediately prior to tree removal, an ecologist or similarly qualified personnel must inspect for the presence of fauna, and capture and relocate as required. Where nesting or habitat hollows are present on trees being removed, this section of the tree must be removed and re-used on site or in the local area.	During construction
E3	Pre-Clearance Survey	Pre-clearance surveys of potential habitat (e.g. trees for nesting birds/arboreal mammals) must be undertaken by a suitably qualified Ecologist.	48 hours prior to commencement of habitat clearing
E4	Unexpected native fauna	If any unexpected native fauna is found on the site during any construction work, work in the vicinity must stop until an ecologist or similarly qualified person captures and relocates the fauna.	During construction
E5	Weed and Pathogen Management	All footwear, personal protective equipment and other equipment must be thoroughly cleaned prior to commencement of works and when entering the site. Wash down procedures must be implemented for all construction vehicles prior to entering or exiting the site to limit weed or pathogen spread.	During construction
E6	Replacement planting	Removal of native vegetation for construction must be replaced by trees at a minimum ratio of 1:1. Reinstate the loss of native canopy species and fragmentation of vegetation through revegetation works within the study area. Species should include locally indigenous species which are consistent with PCT 3269 which provides suitable habitat for local fauna species	During construction
E8	Artificial habitat	Install artificial habitats (nest box of similar entrance diameter) for fauna in adjacent retained vegetation within the study area. A minimum of four nest boxes with entrances between 5 mm to 20 mm should be installed to mitigate impacts of the loss of the hollow-bearing trees (three microbat hanging boxes and two bird/glider boxes 10-15 cm).	Prior to construction
Soil and water			

ID	MM name	Mitigation measure	Timing
SW8	Erosion and sediment control	Prepare a Construction Environmental Management Plan (CEMP) to address measures to be adopted to minimise impacts on the environment as a result of the construction works, including type and location of sediment and erosion controls. A Sediment and Erosion Control Plan (within the CEMP) is to be prepared in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004) and implemented prior to works, with the aim of achieving an outcome of ‘no visible turbid plumes migrating through the waterway’. The Erosion and Sediment Control Plan required by Mitigation Measure C1 must be developed in accordance with the Landcom/Department of Housing <i>Managing Urban Stormwater, Soils and Construction Guidelines</i> (Blue Book). The controls must be in place, inspected and managed until the works are complete and all exposed erodible materials are stable relevant to each construction stage. Inspection records must be kept and provided to the Post Approval and Compliance Team on request. Inspect erosion controls regularly (daily during workdays) and after rainfall. Fix damaged controls immediately. Remove accumulated sediment or waste material from the sediment controls regularly and dispose of at a licensed waste facility. • Monitor sedimentation down slope of excavated areas. • Leave erosion and sediment controls in place until after the works are completed. • Schedule the works outside of predicted heavy rain periods. • Stop work during and following heavy rainfall to reduce risk of mobilising sediment.	Construction
SW9	Chemical controls	Dedicated refuelling areas are to be established outside of the retained vegetation and away from drainage lines or swales. These areas are to be bunded to ensure any spills do not enter the riparian areas or creek. • Ensure appropriate spill kits are present onsite. • Carry associated Safety Data Sheets (SDS) for all chemicals. • Ensure all equipment is in good working order.	Construction
SW10	Weed hygiene control	Wash all equipment, including, erosion and sediment control measures and trailers to prevent spread of exotic species. A visual check for vegetation and seeds on all vehicles, equipment and machinery to be used in the activities must be carried out before work commences.	Construction
SW11	Post-construction sediment and erosion control	Stabilise and rehabilitate all disturbed areas including topsoiling, revegetation, weed control and maintenance in order to adequately restore disturbed areas.	Post-construction

8. Adequacy review

The table below details the REF deliverable requirements and how/where they are addressed in the report.

Table 11: REF deliverable requirements

Requirement	Y	N	N/A	Comments
Biodiversity				
Does the REF include either: - a statement from a suitably qualified ecologist that the proposed activity will not be carried out in a declared area of outstanding biodiversity value and is not likely to significantly affect threatened species, populations or ecological communities, or their habitats or impact biodiversity values, meaning a Species Impact Statement and/or Biodiversity Development Assessment Report is not required having regard to s7.8 of the <i>Biodiversity Conservation Act 2016</i> (this might include a statement that accompanies a Biodiversity Development Assessment Report (BDAR) waiver issued ahead of a previously proposed SSD application); or - a SIS; and/or - a BDAR?	☒	☐	☐	Yes, as per Legislative context BC Act in Table 2 Tests of Significance provided in Appendix B and a summary provided in Section 6.4
A statement that the proposed activity is not likely to have a significant impact on matters of national environmental significance, or on the environment of Commonwealth land, and therefore referral to the Minister under the EPBC Act is not required?	☒	☐	☐	Assessment of Significance provided in Appendix C and a summary in Section 6.5
If the development is on biodiversity certified land, does the REF include information to identify the site (using associated mapping) and demonstrate the proposed development is consistent with the relevant biodiversity measure conferred by the biodiversity certification?	☐	☐	☒	N/A the land is not within on biodiversity certified land as discussed in Table 2.
Does the REF list any mitigation measures identified in the assessment and incorporate them into the design where applicable?	☒	☐	☐	Mitigation measures provided in Section 7

9. Significance of Environmental Impacts

Based on the desktop and field assessment of ecological values within the study area and the nature of the proposed activity, it was determined:

- The extent and nature of potential impacts are low and are not likely to have significant effects on the environment in relation to ecology.
- Potential impacts can be appropriately mitigated or managed to ensure that there is minimal affect.

10. Conclusion

Eco Logical Australia Pty Ltd (ELA) was engaged by the NSW Department of Education (DoE) to prepare a Flora and Fauna Assessment for the proposed New Primary School in Worrigee (the activity). The activity will be assessed under Part 5 of the EP&A Act. This FFA will support the preparation of a REF.

The new Worrigee Public School is located at 9 Worrigee Road, Worrigee NSW 2540. The southeastern corner of the Lot will be used for the proposed New Worrigee Preschool which will be assessed as a separate REF to the primary school.

The proposed works are to construct a new public school with a maximum capacity of 552 students. The proposed activity does not include the new public preschool or roundabout

One PCT, PCT 3269 Shoalhaven Lowland Spotted Gum-Paperbark Forest, was identified within the study area occurring in degraded condition. PCT 3269 (degraded) within the study area did not conform to BC Act listed TEC *Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion* due to the study area is located outside of the geographic distribution according to paragraph 1 of the final determination for the ecological community. Additionally, it did not meet listing criteria for the EPBC Act listed TEC *Illawarra and south coast lowland forest and woodland ecological community* due to containing less than 30 % native perennial understorey.

The field survey identified five hollow bearing trees (HOLLOW-BEARING TREES) within the study area, of which four will be removed (including one subject to root mapping). These have the potential to provide roosting habitat for a wide variety of native species. At the time the field survey was conducted, only little corella was observed utilising some of the hollows. Little corella is not listed under the BC Act or EPBC Act. An assessment of hollow-roosting microbats and south-eastern gloss black cockatoo which may also utilise the hollow was conducted. It was determined that the activity is unlikely to be a significant impact.

Grey-headed flying-fox and gang-gang cockatoo may also utilise native vegetation (PCT 3269) within the study area for seasonal foraging. The vegetation contains nectar flowering and winter flowering tree species *Corymbia maculata*, which are an important foraging resource for grey-headed flying-fox and gang-gang cockatoo during winter. The study area may also provide foraging habitat for threatened microbat species above and amongst the native vegetation canopy.

The impact of the activity 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 species identified from the database search and field habitat assessment. The assessments concluded that the activity is considered unlikely to have a significant impact on those threatened entities. Therefore, a SIS or BDAR under the BC Act, or a referral under the EPBC Act, is not required.

Subject to implementing the mitigation measures set out in Section 7 of this report, the conclusion of this assessment is that the proposed activity is not likely to significantly affect the environment in relation to ecology matters.

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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 area) of the NSW Wildlife Atlas and the EPBC Protected Matters Search Tool. An assessment of likelihood of occurrence was made for threatened communities and 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 study area as presented within the results of the preliminary reports, and professional judgement. Some migratory, marine and aquatic species identified from the Commonwealth database search have been excluded from the assessment due to lack of habitat. The terms for likelihood of occurrence are defined below:

- “yes” – the species was or has been observed on the study area
- “likely” – a medium to high probability that a species uses the study area
- “potential” – suitable habitat for a species occurs on the study area, 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 study area
- “no” – habitat on study area and in the vicinity is unsuitable for the species.

Table 12: Threatened ecological communities' likelihood of occurrence.

Name (BC Act/EPBC Act)	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Impact assessment required
<i>Swamp oak floodplain forest of the NSW North Coast, Sydney Basin and South East Corner bioregions / Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community</i>	E	E	This ecological community is found within the South Eastern Queensland (SEQ), NSW North Coast (NNC), Sydney Basin (SYB) and South East Corner (SEC) IBRA7 bioregions and is found in coastal catchments, mostly at elevations of less than 20 m ASL that are typically found within 30 km of the coast. Coastal Swamp Oak Forest is often found in association with other vegetation types such as coastal saltmarsh, mangroves, freshwater wetlands, littoral rainforests or swamp sclerophyll forests in a 'mosaic' of coastal floodplain communities. The structure of Coastal Swamp Oak Forest can vary from forest to woodland depending on its location in the landscape and disturbance history	No. These TECs were not identified within the study area.	No.
<i>Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions / Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland</i>	E	E	The ecological community described in this document includes the plants, animals and other organisms typically associated with palustrine wetlands, generally swamp forests, found in the temperate to subtropical regions of Australia's east-coast and, which typically has a layered canopy, dominated by melaleucas and/or <i>Eucalyptus robusta</i> (Swamp Mahogany) (Department of Environment and Sustainability 2007; Sheringham et al. 2008; Bell and Driscoll 2016; DELWP 2016; DPI 2016; Miles 2006; Qld Government 2019). The ecological community occurs between the Great Dividing Range and the coast from near Gladstone in Queensland, through New South Wales to the Gippsland Plain east of the Strzelecki Ranges in Victoria. The ecological community typically occurs in low-lying coastal alluvial areas with minimal relief, such as swamps, floodplain pockets, depressions, alluvial flats, back-barrier flats, fans, terraces and behind fore-dunes.	No. These TECs were not identified within the study area.	No.
<i>Illawarra Lowlands Grassy Woodland in the Sydney Basin Bioregion / Illawarra and south coast lowland forest and woodland ecological community</i>	E	CE	The typical form of the ecological community is a woodland with a tall shrub layer and/or a grassy ground cover. The ecological community occurs on the coastal plains and low foothills below the Great Escarpment between Wollongong and just south of Moruya. The ecological community is known from the Wollongong, Shellharbour, Kiama, Shoalhaven and Eurobodalla Local Government Areas (LGAs). The composition of the ecological community at a particular site is influenced by many factors including the size of the site, aspect, rainfall and drainage and by its disturbance history (including clearing, grazing and fire). <i>Eucalyptus tereticornis</i> (Forest Red Gum) is present and often dominant in the mature tree canopy. Other co-occurring tree species include <i>Angophora floribunda</i> (Rough Barked Apple); <i>Eucalyptus bosistoana</i> (Coast Grey Box); <i>Eucalyptus eugenioides</i> (Thin-leaved Stringybark), <i>Eucalyptus botryoides</i> (Bangalay), <i>Eucalyptus globoidea</i> (White Stringy Bark) and <i>Eucalyptus longifolia</i> (Woollybutt) and <i>Eucalyptus quadrangulata</i> (Coastal White Box). A sub-canopy is sometimes present including <i>Melaleuca decora</i> (White Feather Honey-myrtle); <i>Melaleuca styphelioides</i> (Prickly Leaved Tea Tree) or <i>Casuarina glauca</i> (Swamp Oak).	No. These TECs were not identified within the study area.	No.

Name (BC Act/EPBC Act)	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Impact assessment required
<i>Illawarra Subtropical Rainforest in the Sydney Basin Bioregion / Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion</i>	E	CE	Characteristic tree species include <i>Baloghia inophylla</i> (Brush Bloodwood), <i>Brachychiton acerifolius</i> (Flame Tree), <i>Dendrocnide excelsa</i> (Giant Stinging Tree), <i>Diploglottis australis</i> (Native Tamarind), <i>Ficus</i> spp., <i>Pennantia cunninghamii</i> (Brown Beech), and <i>Toona ciliata</i> (Red Cedar). Species of <i>Eucalyptus</i> , <i>Syncarpia</i> and <i>Acacia</i> may also be present as emergents or incorporated into the dense canopy. While rainforest canopies are generally closed, in highly disturbed stands the canopy may be irregular and open. The height of the canopy varies considerably, and structurally some stands are scrub. Recorded from the local government areas of Wollongong, Shellharbour, Shoalhaven and Kiama. Mainly occurs between Albion Park and Gerringong, but outlying occurrences extend south to the Shoalhaven River and west into the Kangaroo Valley. Usually found on Permian volcanic rocks, but can occur on a range of rock types.	No. These TECs were not identified within the study area.	No.
<i>River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions / River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria</i>	E	CE	The structure of the community may vary from tall open forests (>40m) to woodlands. The most widespread and abundant dominant trees include <i>Eucalyptus tereticornis</i> (Forest Red Gum), <i>Eucalyptus amplifolia</i> (Cabbage Gum), <i>Angophora floribunda</i> (rough-barked apple) and <i>Angophora subvelutina</i> (Broad-Leaved Apple). <i>Eucalyptus baueriana</i> (Blue Box), <i>Eucalyptus botryoides</i> (Bangalay) and <i>Eucalyptus elata</i> (River Peppermint) may be common south from Sydney. <i>Eucalyptus ovata</i> (Swamp Gum) occurs on the far south coast, <i>Eucalyptus saligna</i> (Sydney Blue Gum) and <i>Eucalyptus grandis</i> (Flooded Gum) may occur north of Sydney, while <i>Eucalyptus benthamii</i> is restricted to the Hawkesbury floodplain. A layer of small trees may be present, including <i>Melaleuca decora</i> , <i>Melaleuca styphelioides</i> (Prickly-Leaved Teatree), <i>Backhousia myrtifolia</i> (Grey Myrtle), <i>Melia azadarach</i> (White Cedar), <i>Casuarina cunninghamiana</i> (River Oak) and <i>Casuarina glauca</i> (Swamp Oak). Scattered shrubs include <i>Bursaria spinosa</i> , <i>Solanum prinophyllum</i> , <i>Rubus parvifolius</i> , <i>Breynia oblongifolia</i> , <i>Ozothamnus diosmifolius</i> , <i>Hymenanthera dentata</i> , <i>Acacia floribunda</i> and <i>Phyllanthus gunnii</i> . The groundcover is composed of abundant forbs, scramblers and grasses. 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. These TECs were not identified within the study area.	No.
<i>Mount Gibraltar Forest in the Sydney Basin Bioregion / Upland Basalt Eucalypt</i>	E	E	Variable community, existing as either open forest, woodland or scrub. The dominant tree species are <i>Eucalyptus radiata</i> (Narrow-leaved Peppermint), <i>E. piperita</i> (Sydney Peppermint) and <i>E. smithii</i> (Gully Gum) on the upper slopes, and <i>E. radiata</i> , <i>E. piperita</i> , <i>E. fastigata</i> (Brown Barrel) and <i>E. viminalis</i> (Manna Gum) on deeper soils on southern aspects. A shrub or small tree layer dominated by species such as <i>Acacia melanoxylon</i> , <i>Hedycarya angustifolia</i> ,	No. These TECs were not identified	No.

Name (BC Act/EPBC Act)	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Impact assessment required
<i>Forests of the Sydney Basin Bioregion</i>			<i>Notelaea venosa</i> and <i>Pittosporum undulatum</i> occurs in the more sheltered areas. Dominant groundlayer species include <i>Stypandra glauca</i>, <i>Dianella caerulea</i>, <i>Dichondra repens</i> and <i>Themeda australis</i> in drier, more exposed sites. In more sheltered sites, fern species such as <i>Blechnum cartilagineum</i>, <i>Doodia aspera</i> and <i>Pteridium esculentum</i>, and vines such as <i>Eustrephus latifolius</i> and <i>Tylophora barbata</i> are dominant. Confined to a small number of pockets in the central Southern Highlands region. The main occurrence is on Mount Gibraltar near Bowral and Mittagong. Minor occurrences of the community are known from Mount Misery, Mount Flora, Cockatoo Hill and Mount Jellore. Restricted to clay soils on microsyenite intrusions in the central parts of the Southern Highlands. Occurs on gentle to steep slopes with correspondingly deep and shallow soils respectively.	within the study area.	
<i>Robertson Basalt Tall Open-forest in the Sydney Basin and South Eastern Highlands Bioregions / Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion</i>	CE	E	Open forest or woodland reaching to 30 m tall with a sparse to moderately dense shrub layer and a dense herbaceous ground layer. Dominant tree species include <i>Eucalyptus fastigata</i> (Brown Barrel), <i>E. viminalis</i> (Manna Gum), <i>E. radiata</i> (Narrow-leafed Peppermint) and <i>E. cypellocarpa</i> (Mountain Grey Gum). <i>Acacia melanoxylon</i> (Blackwood) is a common small tree species in this community. Common shrubs include <i>Coprosma quadrifida</i> and <i>Senecio linearifolius</i>. Restricted chiefly to occurrences of Robertson Basalt on the Southern Highlands of NSW (between the Illawarra Escarpment to near Bundanoon) but also found on the Cambewarra Range to the south. Found on highly fertile soils derived from basalt, mostly on rolling hills on gentle to steep slopes. Occurs in areas with rainfall between 1000 mm to 1600 mm.	No. These were identified within the study area.	No. TECs not the

Table 13: Threatened and migratory species likelihood of occurrence.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
FLORA							
<i>Acacia bynoeana</i>	Byone's wattle	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.	E	V	0	No. Study area did not contain sandy soils. Species not observed during field surveys. No recent local records.	No
<i>Acacia pubescens</i>	Downy wattle	Occurs on alluviums, shales and at the intergrade between shales and sandstones. The soils are characteristically gravelly soils, often with ironstone. Occurs in open woodland and forest, in a variety of plant communities, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland.	V	V	5	No. The study area did not contain characteristic gravelly soils or associated plant communities. Species not observed during field surveys.	No.
<i>Caladenia tessellata</i>	Thick-lipped spider-orchid	The Thick Lip Spider Orchid is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. It was also recorded in the Huskisson area in the 1930s. The species occurs on the coast in Victoria from east of Melbourne to almost the NSW border. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.	E	V	0	Unlikely. The study area is regularly disturbed. Species not observed during field surveys. No recent local records.	No.
<i>Calochilus pulchellus</i>	Pretty beard orchid	Known only from three locations on the NSW south coast, at altitudes between 20-560 m above sea level. At Vincentia the species grows in low Scribbly Gum dominated woodland	E	E	0	No. Preferred heath habitat on sandy	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		with a low wet heath understorey. The soil is a sandy loam overlying sandstone. In Booderee National Park it grows in a tall heathy association. In Morton National Park on the Little Forest Plateau it occurs in low heath among scattered clumps of emergent eucalypts and Banksia in shallow coarse white sand over sandstone, in a near-escarpment area subject to strong orographic precipitation.				soils not recorded within study area. Species not observed during field surveys. No recent local records.	
<i>Cryptostylis hunteriana</i>	Leafless tongue-orchid	The leafless tongue-orchid grows singly or in small colonies in a range of habitats including wet heath and sedgeland, on grasstree plains and in woodland with scribbly gum, silvertop ash, red bloodwood and black sheoak. It often grows near the other tongue-orchids <i>C. subulata</i> and <i>C. erecta</i> . The species is found in coastal areas and nearby ranges south from the Gibraltar Range National Park in New South Wales to East Gippsland between Marlo and Genoa in Victoria.	V	V	0	No. Preferred associated habitat not present within the study area. Species not observed during field surveys. No recent local records.	No.
<i>Cynanchum elegans</i>	White-flowered wax plant	Found in Dry rainforest, littoral rainforest, <i>Leptospermum laevigatum</i> - <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> (Coastal Tea-tree-Coastal Banksia) coastal scrub, <i>Eucalyptus tereticornis</i> (Forest Red Gum) or <i>Corymbia maculata</i> (Spotted Gum) open forest and woodland; and <i>Melaleuca armillaris</i> (Bracelet Honeymyrtle) scrub. 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.	E	E	0	Unlikely. Vegetation within the study area consistent with preferred <i>Corymbia maculata</i> woodland habitat. However, outside of the species known current occurrence. Species not observed during field surveys. No recent local records.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Eucalyptus langleyi</i>	Albatross mallee, green mallee ash – population north of the Shoalhaven River in the Shoalhaven local government area.	Occurs on skeletal soils on rocky sloping Nowra Sandstone outcrops along Bomaderry Creek. The endangered population occurs at an altitude of 30-40 m above sea level whilst the general <i>E. langleyi</i> population occurs at an altitude of between 130 and 255 m. Occurs as a midstorey species in woodland dominated by Grey Gum (<i>Eucalyptus punctata</i>), but sometimes with Spotted Gum (<i>Corymbia maculata</i>) present. The woodland habitat has a shrubby midstorey comprising species such as Sweet Pittosporum, Tick Bush, Bracelett Honey-myrtle, Black Sheoak, Tea-tree and Sandpaper Fig, and has a mostly shrubby ground layer, but in some places there are significant patches of Blady Grass.	E	V	0	No. Study area south of the Shoalhaven River. Species not observed during field surveys. No recent local records.	No.
<i>Eucalyptus nicholii</i>	Narrow-leaved black peppermint	Dry grassy woodland, on shallow soils of slopes and ridges.	V	V	1	No. Slopes and ridges not present within the study area	No.
<i>Eucalyptus scoparia</i>	Wallangarra white gum	Open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes.	E	V	1	No. Study area not present on slopes or rocky outcrops at high altitudes.	No.
<i>Genoplesium baueri</i>	Bauer's midge orchid / yellow gnat orchid	Dry sclerophyll forest and moss gardens over sandstone. Has been recorded from locations between the Shoalhaven area and Pittwater and may occur as far north as Port Stephens. In the Shoalhaven most commonly found in Red Bloodwood, Hard-leaved Stringybark and Silvertop Ash dominated vegetation.	E	E	0	No. Preferred dry sclerophyll forest over sandstone not present within the study area. Species not observed during field surveys. No recent local records.	No.
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flower grevillea	Grows in sandy or light clay soils usually over thin shales, often with lateritic ironstone gravels and nodules, in a range	V	V	0	Unlikely.	No

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		of vegetation types from heath and shrubby woodland to open forest. In Sydney it has been recorded from Shale Sandstone Transition Forest and in the Hunter in Kurri Sand Swamp Woodland. However, other communities occupied include <i>Corymbia maculata</i> – <i>Angophora costata</i> open forest in the Dooralong area, in Sydney Sandstone Ridgetop Woodland at Wedderburn and in Cooks River / Castlereagh Ironbark Forest at Kemps Creek. Often occurs in open, slightly disturbed sites such as along tracks.				While vegetation within the study area consistent with <i>Corymbia maculata</i> woodland habitat on clay soils, this species was not observed during field survey. No recent local records.	
<i>Haloragis exalata</i> subsp. <i>exalata</i>	Square raspwort	Square Raspwort occurs in 4 widely scattered localities in eastern NSW. It is disjunctly distributed in the Central Coast, South Coast and Northwestern Slopes botanical subdivisions of NSW. Square Raspwort appears to require protected and shaded damp situations in riparian habitats.	V	V	0	No. Preferred riparian habitat not present within the study area. Species not observed during field surveys. No recent local records.	No.
<i>Melaleuca biconvexa</i>	Biconvex paperbark	This species may occur in dense stands forming a narrow strip adjacent to watercourses, in association with other <i>Melaleuca</i> species or as an understorey species in wet forest. Biconvex Paperbark is only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north.	V	V	0	No. Study area not adjacent to a watercourse. Species not observed during field surveys. No recent local records.	No.
<i>Persicaria elatior</i>	Tall knotweed	Tall Knotweed is an erect herb to 90 cm. It has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton	V	V	0	No. Preferred damp habitat alongside waterbodies not present within the	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		Lakes. It normally grows in damp places, especially beside streams and lakes.				study area. Species not observed during field surveys. No recent local records.	
<i>Pimelea spicata</i>	Spiked rice-flower	Once widespread on the Cumberland Plain, the Spiked Rice-flower occurs in 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). In both the Cumberland Plain and Illawarra environments this species is found on well-structured clay soils. On the Cumberland Plain sites it is associated with Grey Box communities (particularly Cumberland Plain Woodland variants and Moist Shale Woodland) and in areas of ironbark. In the coastal Illawarra it occurs commonly in Coast Banksia open woodland with a better developed shrub and grass understorey. Coastal headlands and hilltops are the favoured sites.	E	E	0	Unlikely. Study area contains preferred woodland on clay soils habitat. However, outside of the species current known occurrence. Species not observed during field surveys. No recent local records.	No.
<i>Pomaderris brunnea</i>	Brown pomaderris	Brown Pomaderris is found in a very limited area around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. It also occurs near Walcha on the New England tablelands and in far eastern Gippsland in Victoria. Brown Pomaderris grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	E	V	0	Unlikely. Preferred woodland on clay soils is present within the study area. However, outside of the species current known occurrence. Species not observed during field surveys. No recent local records.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Prasophyllum affine</i>	Jervis bay leek orchid	Low heathland and sedgeland communities on poorly drained clay soils. Known from three areas south-east of Nowra on South Coast: Kinghorne Point, Wowly Gully near the town of Callala Bay, and near the township of Vincentia.	E	E	0	No. Preferred heathland / sedgeland habitat not present within the study area. Species not observed during field surveys. No recent local records.	No.
<i>Prostanthera densa</i>	Villous mintbush	This species has been recorded from the Currarong area in Jervis Bay, Royal National Park (Marley), Cronulla, Helensburgh and Port Stephens (Nelson Bay). The Sydney and Royal National Park populations were thought possibly extinct, but the species is now known to occur at Bass and Flinders Point in Cronulla. <i>Prostanthera densa</i> generally grows in sclerophyll forest and shrubland on coastal headlands and near coastal ranges, chiefly on sandstone, and rocky slopes near the sea	V	V	0	No. Study area does not conform to preferred coastal headland / ranges on sandstone habitat. Species not observed during field surveys. No recent local records.	No.
<i>Pterostylis gibbosa</i>	Illawarra greenhood	Open forest or woodland, on flat or gently sloping land with poor drainage. Known from a small number of populations in the Hunter region (Milbrodale), the Illawarra region (Albion Park and Yallah) and the Shoalhaven region (near Nowra).	E	E	109	No. Preferred woodland habitat is present within the study area, which is situated on flat land. However, species not observed during field surveys. No recent local records.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Pterostylis vernalis</i>	Halbury rustyhood	<i>Pterostylis vernalis</i> is only known from the Nowra area on the NSW south coast. There are five known populations located to the west and south-west of Nowra. Four are within a few kilometres of each other, and one is located approximately 18 km to the south-west. The total population is approximately 450-500 known individuals. <i>P.vernalis</i> grows in open sites around moss gardens in shallow soil over sandstone sheets or moss gardens on heavy laterite associated soils, in heath and dry heathy forest/woodland. The distribution of the plants throughout its range is naturally patchy as the species is often restricted to sections of rock shelf where there is only a thin layer of soil over the rock shelf and where these sites are subject to particular hydrological conditions. Habitat generally contains moss gardens on various substrates.	CE	CE	23	No. Study area not one of five known populations, outside of known current occurrence. Does not contain preferred moss garden on sandstone habitat. Species not observed during field surveys. No recent local records.	No.
<i>Rhizanthella slateri</i>	Eastern underground orchid	An underground orchid with a whitish, fleshy underground stem to 15 cm long and 15 mm diameter. Occurs from south-east Queensland to south-east NSW. 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. Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest. Highly cryptic given that it grows almost completely below the soil surface, with flowers being the only part of the plant that can occur above ground. Therefore usually located only when the soil is disturbed.	V	E	0	Unlikely. Outside of species known current occurrence. Species not observed during field surveys. No recent local records.	No.
<i>Rhodamnia rubescens</i>	Scrub turpentine	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 <i>R. rubescens</i> 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	CE	CE	2	No. Preferred rainforest habitat not present within the study area. Species not	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.				observed during field surveys. No recent local records.	
<i>Rhodomyrtus psidioides</i>	Native guava	Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines. This species is characterised being extremely susceptible to infection by Myrtle Rust.	CE	CE	0	No. Preferred rainforest habitat not present within the study area. Species not observed during field surveys. No recent local records.	No.
<i>Solanum celatum</i>	-	<i>Solanum celatum</i> is restricted to an area from Wollongong to just south of Nowra, and west to Bungonia. Majority of records are prior to 1960 and the majority of populations are likely to have been lost to clearing. Grows in rainforest clearings, or in wet sclerophyll forests and is normally recorded in disturbed margins and clearings.	E	-	1	No. Preferred rainforest habitat not present within the study area. Species not observed during field surveys. No recent local records.	No.
<i>Syzygium paniculatum</i>	Magenta lilly pilli	Found in subtropical and littoral rainforest on gravels, sands, silts and clays. Occurs only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest.	E	V	3	No. Preferred rainforest habitat not present within the study area. Species not observed during field surveys.	No.

Scientific name	Common name		Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Thelymitra kangaloonica</i>	Kangaloon orchid	sun	Only known to occur on the southern tablelands of NSW in the Moss Vale / Kangaloon / Fitzroy Falls area at 550-700 m above sea level. It is known to occur at three swamps that are above the Kangaloon Aquifer. These swamps are a part of the endangered ecological community “Coastal Upland Swamp”. It is found in swamps in sedgeland “over grey silty grey” loam soils. It is thought to be a short-lived perennial, flowering in late October and early November.	CE	CE	0	No. Study area below sea level range the species prefers. Preferred swamp habitat not present within the study area. Species not observed during field surveys. No recent local records.	No.
<i>Thesium australe</i>	Austral toadflax		In eastern NSW, this species is found in very small populations scattered along the coast, and from the Northern to Southern Tablelands. It grows in grassland on coastal headlands or grassland and grassy woodland away from the coast.	V	V	0	Unlikely. Outside of the species known current occurrence. Species not observed during field surveys. No recent local records.	No.
<i>Triplarina nowraensis</i>	Nowra heath-myrtle		Occurs on moist heath on poorly drained, gently sloping sandstone shelves or along creek lines underlain by Nowra Sandstone. Three populations to the immediate west of Nowra, a fourth 18km south-west of Nowra in the Boolijong Creek Valley, and a fifth north of the Shoalhaven River on the plateau above Bundanon. Isolated population also known from Sussex Inlet.	E	E	73	No. Preferred moist heath or creek line habitat not present within the study area. Species not observed during field surveys. No recent local records.	No.
<i>Xerochrysum palustre</i>	Swamp everlasting		The Swamp Everlasting is a perennial herb, to 100 cm tall. Flowers appear from November to March. The species is Found in Kosciuszko National Park and the eastern	-	V	0	No.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		escarpment south of Badja. It grows in swamps and bogs which are often dominated by heaths, and also grows at the edges of bog margins on peaty soils with a cover of shrubs or grasses. It re-sprouts after fires.				Preferred swamp / bog habitat not present within the study area. Species not observed during field surveys. No recent local records.	
<i>Zieria baeuerlenii</i>	Bomaderry Zieria	<i>Zieria baeuerlenii</i> is only known from an area 100 acres near Bomaderry. It grows in soil derived from sandstone in forest, woodland and scrub.	E	E	1	Unlikely. Outside of the species known current occurrence. Species not observed during field surveys. No recent local records.	No.
AMPHIBIA AND REPTILIA							
<i>Heleioporus australiacus</i>	Giant burrowing frog	The Giant Burrowing Frog is distributed in southeastern NSW and Victoria. The southern of its two distinct populations occurs from north of Narooma through to Walhalla, Victoria. It is found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Breeding habitat of this species is generally soaks or pools within first or second order streams.	V	V	1	No. Potential habitat within the study area occurring on clay-based soils. No breeding habitat present within the study area.	No.
<i>Hoplocephalus bungaroides</i>	Broad-headed snake	Dry and wet sclerophyll forests, riverine forests, coastal heath swamps, rocky outcrops, heaths, grassy woodlands. Shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring. Largely confined to Triassic and Permian sandstones within	E	V	0	No. Study area not near sandstone cliff habitat. No local records.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		the coast and ranges in an area within approximately 250 km of Sydney.					
<i>Litoria aurea</i>	Green and golden bell frog	Formerly distributed from the NSW north coast near Brunswick Heads, southwards along the NSW coast to Victoria where it extends into east Gippsland. Records from west to Bathurst, Tumut and the ACT region. Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range, however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands. Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spikerushes (<i>Eleocharis</i> spp.).	E	V	547	Unlikely. Many local records, particularly to the south-east of the study area. No habitat present within study area.	No.
<i>Litoria watsoni</i>	Southern heath frog, Watson's tree frog	Watson's Tree Frog is a recently described species, having been split from <i>L. littlejohni</i> (Littlejohn's Tree Frog) following a taxonomic revision. Watson's Tree Frog is a forest-dependent species, being recorded from a range of natural forest vegetation types at low to high elevations. The species prefers moister areas, with most records from wet forest. Most breeding sites are along lentic water bodies, including ephemeral and permanent ponds, both natural and man-made.	E	E	0	No. Preferred moist forest habitat not recorded within the study area. No local records	No.
<i>Varanus rosenbergi</i>	Rosenberg's goanna	Rosenberg's Goanna occurs on the Sydney Sandstone in Wollemi National Park to the north-west of Sydney, in the Goulburn and ACT regions and near Cooma in the south. Found in heath, open forest and woodland. Associated with termites, the mounds of which this species nests in; termite mounds are a critical habitat component. Individuals require large areas of habitat. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens.	V	-	1	No. No suitable refugia habitat for this species within the study area.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
AVES							
<i>Anthochaera phrygia</i>	Regent honeyeater	The Regent Honeyeater inhabits temperate woodlands and open forests of the inland slopes of south-east Australia, particularly Box-Ironbark woodland, and riparian forests of <i>Casuarina cunninghamiana</i> (River Sheoak). These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. This species makes nomadic movements, following winter flowering Eucalypt species. Two of three known key breeding areas are in NSW: the Capertee Valley and the Bundarra-Barraba region. The other breeding area is in Chiltern, Victoria. They breed between July and January and usually nest in horizontal branches or forks in tall mature Eucalyptus Spp. and <i>Casuarina/Allocasuarina</i> spp.	CE	CE	4	Unlikely. Some local records and suitable forage within the study area. However, very highly disturbed and fragmented from higher quality habitat and contiguous forest.	No.
<i>Apus pacificus</i>	Fork-tailed swift	Riparian woodland., swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand-dunes. The species is thought to be highly mobile within Australia, moving across the country in search of food. They probably roost aerially.	-	M	1	Unlikely. The species would occasionally forage above the study area aerially. However, the species is unlikely to utilise any of the vegetation within the study area for roosting.	No.
<i>Artamus cyanopterus cyanopterus</i>	Dusky woodswallow	This species occurs throughout most of NSW. It primarily inhabits dry, open Eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of Eucalypt saplings, acacias and other shrubs, and groundcover of grasses or sedges and fallen woody debris. Nest sites vary greatly, but generally occur in shrubs or low trees (living or dead) in horizontal or upright forks in branches, spouts, hollow stumps or logs, behind loose bark or in a hollow in the top of a wooden fence post.	V	-	11	Unlikely. Marginal foraging habitat present within the study area, however the study area is small, and this species is highly mobile and unlikely to utilise	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
						resources on this small site.	
<i>Botaurus poiciloptilus</i>	Australasian bittern	Found over most of NSW, this species' habitat consists of permanent freshwater wetlands, with tall, dense vegetation, particularly Typha spp. (Bulrushes).	E	E	8	No. Preferred wetland habitat not present within the study area.	No.
<i>Burhinus grallarius</i>	Bush stone-curlew	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common. In the south-east, it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber. Largely nocturnal, being especially active on moonlit nights	E	-	3	Unlikely. Preferred habitat refugia such as fallen timber not present within the study area. Study area outside of the species typical distribution.	No.
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	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.	-	M	0	No. Preferred wetland foraging habitat not present within the study area.	No.
<i>Calidris ferruginea</i>	Curlew sandpiper	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.	CE	CE, M	0	No. Preferred wetland foraging habitat not present within the study area.	No.
<i>Calidris melanotos</i>	Pectoral sandpiper	Shallow fresh to saline wetlands, including coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	-	M	1	No. Preferred wetland foraging habitat not present within the study area.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Callocephalon fimbriatum</i>	Gang-gang cockatoo	In spring and summer (during the breeding season), this species is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter (non-breeding season), the species often moves to lower altitudes in drier more open Eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. Potential breeding trees are Eucalypts containing hollows that are at least 9 m above the ground and with hollow diameter of 10 cm or larger.	E	E	8	Potential Suitable foraging habitat recorded within the study area.	Yes
<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia. Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of She-oak occur. Black She-oak (<i>Allocasuarina littoralis</i>) and Forest She-oak (<i>A. torulosa</i>) are important foods.	V	V	68	Potential. Suitable breeding habitat recorded within the study area. No foraging habitat present.	Yes
<i>Circus assimilis</i>	Spotted harrier	The Spotted Harrier occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including <i>Acacia</i> and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months.	V	-	2	Unlikely. The species is uncommon in coastal woodland habitat. Low number of local records.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Climacteris picumnus victoricae</i>	Brown Treecreeper (eastern subspecies)	This species occurs in Eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is not usually found in woodlands with a dense shrub layer. Fallen timber is an important habitat component for foraging. It is a sedentary species and is resident in many locations throughout its range and is present in all seasons or year-round at many sites. Hollows in standing dead or live trees and tree stumps are essential for nesting.	V	V	0	Unlikely. No suitable habitat refugia identified within the study area. No local records.	No.
<i>Cuculus optatus</i>	Oriental cuckoo	Northern and eastern Australia, records mainly coastal in NSW south to Bega area. Non breeding habitat: monsoonal rainforest, vine thickets, wet sclerophyll forest or open Casuarina, Acacia or Eucalyptus woodland.	-	M	0	No. Preferred rainforest habitat not present within the study area. No local records.	No.
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	The distribution of the Eastern Bristlebird has contracted to three disjunct areas of south-eastern Australia. There are three main populations: Northern - southern Queensland/northern NSW, Central - Barren Ground NR, Budderoo NR, Woronora Plateau, Jervis Bay NP, Booderee NP and Beecroft Peninsula and Southern - Nadgee NR and Croajingalong NP in the vicinity of the NSW/Victorian border. Habitat for central and southern populations is characterised by dense, low vegetation including heath and open woodland with a heathy understorey. In northern NSW the habitat occurs in open forest with dense tussocky grass understorey and sparse mid-storey near rainforest ecotone.	E	E	1	No. Preferred heath or dense, low vegetation habitat present within the study area.	No.
<i>Ephippiorhynchus asiaticus</i>	Black-necked stork	Coastal and subcoastal northern and eastern Australia, south to central-eastern NSW and with vagrants recorded further south and inland. In NSW, floodplain wetlands of the major coastal rivers are key habitat. Also minor floodplains, coastal sandplain wetlands and estuaries. Usually forage in water 5-30cm deep for vertebrate and invertebrate prey (eels, fish, frogs and invertebrates). Black-necked Storks build large nests high in tall trees close to water.	E	-	1	Unlikely. Preferred wetland habitat not present within the study area.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Epthianura albifrons</i>	White-fronted chat	The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas.	V	-	3	Unlikely. Preferred wet saltmarsh or grassland habitat not present within the study area.	No.
<i>Falco hypoleucos</i>	Grey falcon	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. It is usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	V	V	0	Unlikely. Study area outside of the species typical distribution. No local records.	No.
<i>Falco subniger</i>	Black falcon	The Black Falcon is widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres. Woodland, shrubland and grassland, especially riparian woodland and agricultural land. Often associated with streams or wetlands.	V	-	1	Unlikely. Preferred habitat not present within study area and there are no known nearby nests.	No.
<i>Gallinago hardwickii</i>	Latham's snipe	Summer migrant. Freshwater, saline or brackish wetlands up to 2000 m above sea-level; usually freshwater swamps, flooded grasslands or heathlands. It feeds in mud or in very shallow water with low, dense vegetation. Roosting occurs on the ground near or in foraging areas beside or under clumps of vegetation, among dense tea-tree, in forests, in drainage ditches or plough marks, among boulders, or in shallow water if cover is unavailable.	V	V, M	2	Unlikely. Preferred wetland habitat not present within the study area.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Grantiella picta</i>	Painted honeyeater	This species is nomadic and occurs predominantly on the inland slopes of the Great Dividing Range. It inhabits <i>Acacia pendula</i> (Boree/Weeping Myall), <i>A. harpophylla</i> (Brigalow) and Box-Gum Woodlands and Box-Ironbark Forests. It is a specialist feeder on the fruits of mistletoes growing on woodland Eucalypts and Acacias, preferring mistletoes of the genus <i>Amyema</i> . Nesting occurs from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping <i>Eucalyptus</i> spp., <i>Allocasuarina</i> and <i>Casuarina</i> spp. (She-oaks), <i>Melaleuca</i> sp. (Paperbark) or Mistletoe branches.	V	V	0	Unlikely. Preferred foraging habitat (mistletoes) not identified within the study area. No local records.	No.
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle	In New South Wales, the White-bellied Sea-Eagle is widespread along the east coast, and along all major inland rivers and waterways. Habitats are characterised by the presence of large areas of open water, including larger rivers, swamps, lakes, and the sea. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest).	V	-	27	Unlikely. Study area not nearby a large waterbody. Vegetation within the study area unlikely to be utilised for breeding habitat.	No.
<i>Hieraaetus morphnoides</i>	Little eagle	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. She-oak 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.	V	-	1	Unlikely. Marginal foraging habitat present within the study area. Vegetation within the study area unlikely to be utilised for breeding habitat.	No.
<i>Hirundapus caudacutus</i>	White-throated needletail	The White-throated Needletail is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. They	V	V, M	3	Unlikely. The species would occasionally forage above the study area aerially. However, the	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		are recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but are less commonly recorded flying above woodland. The species also occurs over heathland, but less often over treeless areas such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks.				species is unlikely to utilise any of the vegetation within the study area for roosting.	
<i>Ixobrychus flavicollis</i>	Black bittern	The Black Bittern has a wide distribution, from southern NSW north to Cape York and along the north coast to the Kimberley region. The species also occurs in the south-west of Western Australia. In NSW, records of the species are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland. 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	V	-	4	No. Preferred wetland habitat not present within the study area.	No.
<i>Lathamus discolor</i>	Swift parrot	This species breeds in Tasmania during Spring and Summer and migrates to the Australian south-east mainland between March and October. On the mainland they occur where Eucalypts are flowering profusely, or where there are abundant lerp infestations. Favoured feed trees include winter flowering species such as Eucalyptus robusta (Swamp Mahogany), Corymbia maculata (Spotted Gum), C. gummifera (Red Bloodwood), E. sideroxylon (Mugga Ironbark), and E. albens (White Box).	E	CE	0	Unlikely. Marginal foraging habitat present within the study area. No local records.	No.
<i>Lophoictinia isura</i>	Square-tailed kite	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. Found in a variety of timbered habitats including dry woodlands and open	V	-	39	Unlikely. Preferred habitat not present within study area and there are no known nearby nests.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		forests. Shows a particular preference for timbered watercourses.					
<i>Melanodryas cucullata</i>	South-eastern hooded robin	This species is found throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by the subspecies <i>pictata</i> . It inhabits open Eucalypt woodland, Acacia scrub and mallee, often in or near clearing or open areas. It nests in tree forks or crevices, from 1 to 5 m above ground.	E	E	0	Unlikely. Study area outside of the species typical distribution. No local records.	No.
<i>Neophema chrysogaster</i>	Orange-bellied parrot	The Orange-bellied Parrot breeds in the south-west of Tasmania and migrates in autumn to spend the winter on the mainland coast of south-eastern South Australia and southern Victoria. There are occasional reports from NSW, with the most recent records from Shellharbour and Maroubra in May 2003. Typical winter habitat is saltmarsh and strandline/foredune vegetation communities either on coastlines or coastal lagoons. Spits and islands are favoured but they will turn up anywhere within these coastal regions. The species can be found foraging in weedy areas associated with these coastal habitats or even in totally modified landscapes such as pastures, seed crops and golf courses.	CE	CE	0	Unlikely. Study area outside of the species typical distribution. No local records.	No.
<i>Neophema chrysostoma</i>	Blue-winged parrot	This species is found across south-eastern Australia, north to the Flinders Ranges, and across Victoria. It is more sporadic across central and western New South Wales and into Queensland. It lives in savannah woodland, grasslands, orchards, farmlands, marshes, heath, dunes, and other open habitats up to 1,200 m (3,937 ft) above sea level. mainly feed on the ground, eating seeds of grasses.	V	V	0	Unlikely. Study area outside of the species typical distribution. No local records.	No.
<i>Neophema pulchella</i>	Turquoise parrot	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.	V	-	5	Unlikely. Marginal habitat present within the study but is highly disturbed and not preferable to the species.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Ninox strenua</i>	Powerful owl	In NSW, the Powerful Owl is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains. 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. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation. Pairs of Powerful Owls demonstrate high fidelity to a large territory, the size of which varies with habitat quality and thus prey densities. In good habitats a mere 400 ha can support a pair when prey are dense. Where hollow trees and prey have been depleted, the owls need up to 4000 ha. Powerful 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. While the female and young are in the nest hollow the male Powerful Owl roosts nearby (10-200 m) guarding them, often choosing a dense "grove" of trees that provide concealment from other birds that harass him.	V	-	12	Unlikely. Requires large tracts of open forest which are not present in the land surrounding the study area.	No.
<i>Pandion cristatus</i>	Eastern osprey	Eastern Ospreys are found right around the Australian coast line, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines, islands and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia. There are a handful of records from inland areas. They favour coastal areas, especially the mouths of large rivers, lagoons and lakes	V	M	4	Unlikely. Study area not situated on the coast adjacent to a preferred waterbody habitat.	No.
<i>Parvipsitta pusilla</i>	Little lorikeet	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. Forages primarily in the canopy of open Eucalyptus Forest and woodland, yet also finds food in	V	-	3	Unlikely. Marginal foraging habitat present within the study	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity.				area. Low number of local records.	
<i>Petroica boodang</i>	Scarlet robin	In NSW, the Scarlet Robin occurs from the coast to the inland slopes. It inhabits Dry Eucalypt forests and woodlands, and occasionally mallee, wet forest, wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber.	V	-	4	Unlikely. Preferred habitat refugia not present within the study area.	No.
<i>Pycnoptilus floccosus</i>	Pilotbird	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 preferred habitat is temperate wet sclerophyll forests and occasionally temperate rainforest, where there is dense undergrowth with abundant debris.	V	V	1	No. Preferred wet sclerophyll / rainforest not present within the study area.	No.
<i>Rostratula australis</i>	Australian painted snipe	In NSW, records of the Painted Snipe are from the Murray-Darling Basin, including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp, and swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. It prefers the fringes of swamps, dams and nearby marshy areas, where there is a cover of grasses, lignum, low scrub or open timber. It nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds.	E	E	2	Unlikely. Preferred wetland habitat not present within the study area.	No.
<i>Stagonopleura guttata</i>	Diamond firetail	Within NSW, the Diamond Firetail has mainly been recorded in the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina, and less commonly in coastal areas and further inland. It prefers gassy Eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas, and lightly wooded farmland. The species roosts in dense shrubs or in smaller nests built especially for roosting.	V	V	0	Unlikely. Marginal foraging habitat present within the study area. No local records.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Stictonetta naevosa</i>	Freckled duck	The Freckled Duck is found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system. Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Generally rest in dense cover during the day, usually in deep water. Feed at dawn and dusk and at night on algae, seeds and vegetative parts of aquatic grasses and sedges and small invertebrates.	V	-	3	Unlikely. Preferred wetland habitat not present within the study area.	No.
<i>Tyto novaehollandiae</i>	Masked owl	Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. Pairs have a large home-range of 1000 hectares or more, depending on prey availability. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	V	-	3	Unlikely. Preferred roosting habitat not present within the study area. May occasionally utilise the study area for foraging.	No.
MAMMALIA (EXCLUDING BATS)							
<i>Cercartetus nanus</i>	Eastern pygmy-possum	The Eastern Pygmy Possums inhabit rainforests, wet Eucalypt forests, heaths, and dry Eucalypt forests that have well-developed mid-storeys containing nectar-producing shrubs such as Banksia spp.	V	-	2	No. Study area does not contain preferred foraging habitat.	No.
<i>Dasyurus maculatus</i>	Spotted-tailed quoll	The Spotted-tailed Quoll has been recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. It uses hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. It is mostly nocturnal and spends most of the time on	V	E	1	No. Preferred habitat refugia not present within the study area. Limited	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		the ground, although is also an excellent climber and will hunt in tree hollows and prey on roosting birds.				connectivity between the study area and patches of remnant vegetation in the surrounding landscape.	
<i>Isododon obesulus</i>	Southern brown bandicoot (eastern)	Southern Brown Bandicoots are generally only found in heath or open forest with a heathy understorey on sandy or friable soils. They feed on a variety of ground-dwelling invertebrates and the fruit-bodies of hypogeous (underground-fruited) fungi. Males have a home range of approximately 5-20 hectares whilst females forage over smaller areas of about 2-3 hectares. Nests may be located under Grass trees (<i>Xanthorrhoea</i> spp.), blackberry bushes and other shrubs, or in rabbit burrows.	E	E	1	No. Preferred heath habitat not present within the study area.	No.
<i>Petauroides volans</i>	Greater glider (southern and central)	The Greater Glider occurs in Eucalypt forests along the ranges and coastal plains of eastern Australia, feeding almost exclusively on the young leaves and flower buds of select Eucalypt species. It shelters in tree hollows, with a particular preference for large hollows in large, old trees. Individuals occupy relatively small home ranges (1-3 ha).	E	E	0	No. Study area with limited connectivity to remnant native vegetation. No local records.	No.
<i>Petaurus australis</i>	Yellow-bellied glider	The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Qld to Victoria. It is restricted to tall mature forests, preferring productive tall open sclerophyll forests with a mosaic of tree species including some that flower in winter. Large hollows (>25 cm) within mature trees are required for shelter, nesting and breeding. The species feeds primarily on plant and insect exudates. Individuals are very mobile, occupying large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food.	V	V	44	Unlikely. Study area with limited connectivity to remnant native vegetation. Mosaic of different tree species not present within the study area.	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Petrogale penicillata</i>	Brush-tailed rock-wallaby	In NSW, the Brush-tailed Rock-wallaby occurs from south-east Queensland to the Grampians in western Victoria, roughly following the line of the Great Dividing Range. It inhabits rocky escarpments, outcrops and cliffs, with a preference for complex structures with fissures, caves and ledges.	E	V	0	No. Preferred rocky escarpment habitat not present within the study area.	No.
<i>Phascolarctos cinereus</i>	Koala	The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In New South Wales, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range. Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Spend most of their time in trees, but will descend and traverse open ground to move between trees. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size. Generally solitary, but have complex social hierarchies based on a dominant male with a territory overlapping several females and sub-ordinate males on the periphery.	E	E	1	Unlikely. Marginal foraging habitat available within the study area, Study area with limited connectivity to remnant native vegetation.	No.
<i>Pseudomys novaehollandiae</i>	New holland mouse, pookila	A small burrowing native rodent with a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Inhabits open heathlands, open woodlands with a heathland understorey and vegetated sand dunes. A social animal, living predominantly in burrows shared with other individuals. The home range of the New Holland Mouse ranges from 0.44 ha to 1.4 ha and the species peaks in abundance during early to mid-stages of vegetation succession typically induced by fire	-	V	0	No. No suitable habitat within the study area and no local records.	

MAMMALIA (BATS)

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Chalinolobus dwyeri</i>	Large-eared bat	Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country. Roosts in caves, rock overhangs and disused mine shafts, and is associated with rock outcrops and cliff faces. 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.	V	V	6	Unlikely. No suitable roosting habitat within the study area or nearby for this species.	No.
<i>Falsistrellus tasmaniensis</i>	Eastern false pipistrelle	The Eastern False Pipistrelle is found along the south-east coast and along the ranges of Australia, from southern Qld to Victoria and Tasmania. In NSW, records extend to the western slopes of the Great Dividing Range. It inhabits tall (greater than 20m), moist habitats. The species predominately roosts in Eucalypt tree hollows, but has also been found to roost under loose bark on trees and in man-made structures. It hunts beetles, moths, weevils and other flying insects above or just below the tree canopy, in open forests.	V	-	5	Potential. Potential roosting habitat available within the study area in the form of hollow-bearing trees.	Yes.
<i>Micronomus norfolkensis</i>	Eastern coastal free-tailed bat	The Eastern Coastal Free-tailed Bat is found along the east coast from south Qld to southern NSW, dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. It roosts in tree hollows but will also roost under bark or in man-made structures. Individuals are usually solitary but have also been recorded roosting communally. The species is probably insectivorous.	V	-	2	Potential. Potential roosting habitat available within the study area in the form of hollow-bearing trees.	Yes.
<i>Miniopterus australis</i>	Little bent-winged bat	East coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW. Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats. They often share roosting sites	V	-	1	Unlikely. Potential roosting habitat within the study area in the form of hollow-bearing trees. However, at the very southern extent of the	No.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
		with the Common Bentwing-bat and, in winter, the two species may form mixed clusters.				species distribution.	
<i>Miniopterus orianae oceanensis</i>	Large bent-winged bat	Large Bentwing-bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but they also use derelict mines, storm-water tunnels, buildings and other man-made structures. Large Bent-winged Bats 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. The species hunts in forested areas.	V	-	15	Unlikely. No suitable roosting habitat within the study area or nearby for this species.	No.
<i>Myotis macropus</i>	Southern myotis	In NSW, the Southern Myotis is found in the coastal band. It is rarely found more than 100 km inland, except along major rivers. It forages over streams and pools, and generally roosts 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.	V	-	3	Unlikely. Roosting habitat within 100m of a waterbody >3m wide is not present within the study area.	No.
<i>Pteropus poliocephalus</i>	Grey-headed flying-fox	This species is found along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria. It inhabits subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	V	V	2378	Likely. The species likely uses vegetation within the study area as foraging habitat.	Yes.
<i>Saccolaimus flaviventris</i>	Yellow-bellied sheath-tail-bat	The Yellow-bellied Sheath-tail-bat is a wide-ranging species found across northern and eastern Australia. The species roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. The species forages in most habitats across its very wide range, with and without trees.	V	-	3	Potential. Potential roosting habitat available within the study area in the form of hollow-bearing trees.	Yes.

Scientific name	Common name	Habitat associations	BC Act status	EPBC Act status	BioNet records within 5 km	Likelihood of occurrence	Impact assessment required
<i>Scoteanax rueppellii</i>	Greater broad-nosed bat	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. The species 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. The species usually roosts in tree hollows but has also been found in buildings.	V	-	6	Potential. Potential roosting habitat available within the study area in the form of hollow-bearing trees.	Yes.

Appendix B Test of Significance (BC Act)

The 'Test of significance' (5-part test) is applied to species, populations and ecological communities listed on Schedules 1 and 2 of the BC Act and Schedules 4, 4A and 5 of the FM Act. The assessment sets out five factors, which when considered, allow proponents to undertake a qualitative analysis of the likely impacts of an action and to determine whether a significant impact is likely. All factors must be considered, and an overall conclusion made based on all factors in combination.

Tests of Significance have been undertaken for the following threatened entities:

The 'Test of significance' (5-part test) is applied to species, populations and ecological communities listed on Schedules 1 and 2 of the BC Act and Schedules 4, 4A and 5 of the FM Act. The assessment sets out five factors, which when considered, allow proponents to undertake a qualitative analysis of the likely impacts of an action and to determine whether a significant impact is likely. All factors must be considered, and an overall conclusion made based on all factors in combination.

Tests of Significance have been undertaken for the following threatened entities:

- *Pteropus poliocephalus* (grey-headed flying fox)
- Microchiropteran bats:
 - *Micronomus norfolkensis* (eastern coastal free-tailed bat)
 - *Falsistrellus tasmaniensis* (eastern false pipistrelle)
 - *Saccolaimus flaviventris* (yellow-bellied sheath-tail bat)
 - *Scoteanax rueppellii* (greater broad-nosed bat)
- *Calyptorhynchus lathami lathami* (south-eastern glossy black cockatoo)
- *Callocephalon fimbriatum* (gang-gang cockatoo)

B1: *Pteropus poliocephalus* (grey-headed flying-fox)

The grey-headed flying-fox (GHFF) is listed as vulnerable under the BC Act and has previously been recorded within 5 km of the study area (DPE 2023b). The proposal includes the removal of 0.19 ha of PCT 3269 which serves as potential foraging habitat for this species. This includes 0.17 ha of direct impacts to PCT 3269 and potential impacts to 0.02 ha of PCT 3269 (i.e. tree 1 and 64) subject to root mapping. The proposed activity also will result in ground disturbance to 0.19 ha of PCT 3269 which does not represent habitat for this species.

For the purpose of this impact assessment the direct impact on foraging habitat for this species is 0.19 ha of PCT 3269 due to removal of canopy species. The recently approved New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed, resulting in a cumulative impact of a 0.5 ha reduction in potential foraging habitat for GHFF.

No known GHFF camps are present within the study area. GHFF present in camps within a 20 km radius of the study area may use the foraging resources available within the impact area. The potential foraging habitat within the impact area is marginal (*Eucalyptus* spp.) and would not be relied upon as a sole foraging resource for this species. The closest Nationally Important camp for grey-headed Flying-fox occurs approximately 4.8 km north-west of the study area. Other smaller camps located closer to the subject area include one in Bomaderry approximately 5.6 km to the north west and one in Nowra Hill approximately 6.3 km to the south west (DCCEEW 2025c).

Table 14: BC Act Test of Significance for GHFF

BC Act	Question	Response
7.3.1(a)	In the case of a threatened species: whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	There are no known GHFF camps within the study area (DCCEEW, 2025c). The closest Nationally Important camp for GHFF occurs approximately 4.8 km north-west of the study area (DCCEEW 2025c). Other smaller camps located closer to the subject area include two in Bomaderry approximately 4.9 km and 5.6 km to the north west and one in Nowra Hill approximately 6.3 km to the south west (DCCEEW 2025c). The proposal would result in removal of 0.19 ha of potential foraging habitat (comprised of <i>Eucalyptus</i> species) for GHFF. Additionally, the New Public Preschool would result in 0.31 ha of PCT 3269 being removed. This would lead to a cumulative impact of a 0.5 ha reduction in potential foraging habitat for GHFF. The works will not result in impacts to breeding habitat in the form of camps. It is considered unlikely that the proposal would place a viable population of the species at risk of extinction given that breeding habitat will not be affected by the activity and the area of potential foraging habitat is small in extent and would only be used occasionally, as part of a mosaic of foraging resources.
7.3.1(b) (i)	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: Is likely	N/A

BC Act	Question	Response
	to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	
7.3.1(b) (ii)	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	N/A
7.3.1(c) (i)	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	Impacts to potential foraging habitat for this species would be minimal. Approximately 0.19 ha of PCT 3269 will be removed as a result of the proposal. This includes two trees (tree 1 and 64) (0.02 ha of PCT 3269) which may be retained subject to root mapping, reducing the impact to 0.17 ha if retained. An additional 0.19 ha of PCT 3269 will be subject to ground disturbance due to landscaping, however the canopy will be retained as foraging habitat for this species. Additionally, the New Public Preschool would result in 0.31 ha of PCT 3269 being removed. This would lead to a cumulative impact of a 0.5 ha reduction in potential foraging habitat for GHFF.
7.3.1(c) (ii)	In relation to the habitat of a threatened species or ecological community: Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity	The proposal will involve removal of approximately 0.19 ha of foraging habitat. Additionally, the New Public Preschool would result in 0.31 ha of PCT 3269 being removed. This would lead to a cumulative impact of a 0.5 ha reduction in potential foraging habitat for GHFF. However, additional foraging resources, particularly planted eucalyptus are available throughout the surrounding landscape. Given the highly mobile nature of this species, individuals can readily access these nearby areas of similar vegetation. As such, the habitat within the study area is expected to function only as marginal foraging habitat within a broader network of resources across the landscape. GHFF forage up to 20 km per night and is unlikely to rely on this patch of habitat. The removal of this habitat will not cause fragmentation or isolation, as this highly mobile species is still able to disperse between habitat in the locality. As such, the removal of 0.19 ha of marginal foraging habitat for this activity (or the 0.5 ha from cumulative impacts when considering the New Public Preschool) will not significantly impact the connectivity of GHFF habitat or separate a camp from their nearest foraging habitat.
7.3.1(c) (iii)	In relation to the habitat of a threatened species or ecological community: The importance of the habitat to be removed, modified, fragmented or isolated to the	The proposal would result in removal of 0.19 ha of marginal potential foraging habitat for GHFF. Additionally, the New Public Preschool would result in 0.31 ha of PCT 3269 being removed. This would lead to a cumulative impact of a 0.5 ha reduction in potential foraging habitat for GHFF.

BC Act	Question	Response
	long-term survival of the species, population or ecological community in the locality.	This small area of habitat (0.19 ha), (or 0.5 ha when including the cumulative impacts of the New Public Preschool) to be affected is not considered vital to the long-term survival of this species within the locality because the species is highly mobile and would be able to continue foraging in similar or better quality vegetation, with foraging opportunities existing 1.5 km south of the study area in Worrigee Nature Reserve. The condition of the vegetation to be removed is poor and is unlikely to represent important foraging resources for GHFF.
7.3.1(d)	Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposal would not impact any declared Areas of Outstanding Biodiversity Value.
7.3.1(e)	Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The proposal are associated with the KTPs: <i>Clearing of native vegetation</i> Impacts are considered minimal as only 0.19 ha of degraded condition marginal foraging habitat would be removed as a result of the proposal. The clearing of 0.19 ha of poor condition native vegetation is unlikely to exacerbate this key threat. The cumulative impacts of the New Public Preschool would include an additional 0.31 ha of native vegetation clearing. This results in a total of 0.5 ha of native vegetation removal, which is still relatively small scale and vegetation adjacent to these activities will be retained. Therefore, it is unlikely to exacerbate this key threat.
Conclusion	Is there likely to be a significant impact?	The proposal are unlikely to have a significant impact on GHFF for the following reasons: - The extent of removal of foraging habitat in the context of the study area and broader landscape is minimal (0.19 ha), (or 0.5 ha when considering the cumulative impacts of the New Public Preschool). - GHFF is unlikely to rely on these patches of habitat, and would only occasionally use it as part of a broader network of foraging resources across the landscape - Additional better foraging habitat is available in the locality. - The proposal would not result in fragmentation of foraging habitat for the species. - No breeding habitat (camps) would be affected by the proposal.

B2: Microchiropteran Bats

For the purpose of this Test of Significance, the microchiropteran bat species listed below have been assessed together, due to the similarities in their habitat associations and biology. Where appropriate, differences between species have been discussed separately.

- *Falsistrellus tasmaniensis* (eastern false pipistrelle)
- *Micronomus norfolkensis* (eastern coastal free-tailed bat)
- *Saccolaimus flaviventris* (yellow-bellied sheath-tail bat)
- *Scoteanax rueppellii* (greater broad-nosed bat).

All of the species listed above have been recorded within the locality (five kilometres of the study area). None of these records were within the study area. Suitable foraging habitat was identified for all of these species. These microchiropteran bat species are listed as vulnerable under the BC Act. Collectively, these species are known to roost in tree hollows, under loose bark on trees, in buildings, caves and tunnels.

Most species forage along the edges of forests, cleared paddocks, tree-lined water courses and above or just below the tree canopy. All the bats are known to feed on small flying insects, and some on beetles, weevils and moths.

These species are threatened by processes including loss of trees for foraging and large hollow-bearing trees for roosting, disturbance to winter roosting and breeding sites, and application of pesticides in or adjacent to foraging areas (DPIE 2021).

The proposal includes the removal of 0.19 ha of PCT 3269 which serves as potential foraging habitat for these species. This includes 0.17 ha of direct impacts to PCT 3269 and potential impacts to 0.02 ha of PCT 3269 (i.e. two additional trees) subject to root mapping. The proposed activity also will result in ground disturbance to 0.19 ha of PCT 3269. As the canopy will be retained, this does not result in a direct impact to habitat for these species. However, it is noted that regeneration of vegetation within this area will be reduced and therefore, reduction in future foraging habitat may occur.

For the purpose of this impact assessment the direct impact on foraging habitat for this species is 0.19 ha of PCT 3269 due to removal of canopy species. The recently approved New Public Preschool would result in an additional 0.31 ha of PCT 3269 and six hollow-bearing trees being removed, resulting in a cumulative impact of a 0.5 ha reduction in potential foraging habitat and loss of ten hollow-bearing trees as potential roosting habitat.

***Falsistrellus tasmaniensis* (eastern false pipistrelle)**

The eastern false pipistrelle is relatively large with a head-body length of about 65 mm. It weighs up to 28 grams. It is dark to reddish-brown above and paler grey on its underside. It has long slender ears set well back on the head and some sparse hair on the nose. They are found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania.

***Micronomus norfolkensis* (eastern coastal free-tailed bat)**

The eastern freetail-bat has dark brown to reddish brown fur on the back and is slightly paler below. Like other freetail-bats it has a long (3 - 4 cm) bare tail protruding from the tail membrane. eastern freetail-bats are also known as mastiff-bats, having hairless faces with wrinkled lips and triangular ears. They weigh up to 10 grams. They are found along the east coast from south Queensland to southern NSW.

***Saccolaimus flaviventris* (yellow-bellied sheath-tail bat)**

The yellow-bellied sheath-tail-bat is a very distinctive, large, insectivorous bat up to 87 mm long. It has long, narrow wings, a glossy, jet-black back, and a white to yellow belly extending to the shoulders and just behind the ear. Characteristically, it has a flattened head and a sharply-pointed muzzle. The tail is covered with an extremely elastic sheath that allows variation in the tail-membrane area. Males have a prominent throat pouch; females have a patch of bare skin in the same place. The yellow-bellied sheath-tail-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.

***Scoteanax rueppellii* (greater broad-nosed bat)**

The greater broad-nosed bat is a large powerful bat, up to 95 mm long, with a broad head and a short square muzzle. It is dark reddish-brown to mid-brown above and slightly paler below. It is distinguished from other broad-nosed bats by its greater size. While similar to the eastern false pipistrelle, it differs by having only two (not four) upper incisors. 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.

Table 15: BC Act Test of Significance for vulnerable microbat species

BC Act	Question	Response
7.3.1(a)	In the case of a threatened species: whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The proposal would impact 0.19 ha of marginal foraging habitat (PCT 3269) and roosting habitat (four hollow bearing trees including two which may be habitat for microbats) for eastern false pipistrelle, eastern coastal free-tailed bat, yellow-bellied sheath-tail-bat, and greater broad-nosed bat. The patches of habitat are small, have poor structural complexity and would be utilised as part of a wider range of foraging and roosting resources in the broader landscape for these highly mobile species. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 and loss of six trees which contain potential roosting habitat for threatened microbats. The cumulative impacts of both activities would result in 0.5 ha of PCT 3269 being removed and loss of ten hollow-bearing trees. These highly mobile species would be able to access a considerably patch of similar habitat approximately 1.5 km south of the study area. Therefore, it is considered that the local population will still be viable and not placed at risk of extinction, including with consideration of the cumulative impacts of the New Public Preschool.
7.3.1(b) (i)	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	N/A
7.3.1(b) (ii)	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	N/A
7.3.1(c) (i)	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposal would remove 0.19 ha of potential foraging habitat. This includes two trees (tree 1 and 64) (0.02 ha of PCT 3269) which may be retained subject to root mapping. If retained, the total removal would be 0.17 ha of potential foraging habitat. An additional 0.19 ha of PCT 3269 will be retained but will be subject to ground disturbance for landscaping. Four hollow-bearing trees identified within the study area will be removed of which two may offer potential roosting habitat. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 and loss of six trees which contain potential roosting habitat for threatened microbats. The cumulative

BC Act	Question	Response
		impacts of both activities would result in 0.5 ha of PCT 3269 being removed and loss of ten hollow-bearing trees. There is similar foraging habitat available approximately 1.5 km south of the study area. These species are highly mobile and are likely to utilise a large area.
7.3.1(c) (ii)	In relation to the habitat of a threatened species or ecological community: Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity	The proposal is concentrated in areas which are already cleared or dominated by exotic vegetation. The 0.19 ha of native vegetation to be removed would not result in further fragmenting or isolating potential habitat, because these highly mobile species will still be able to access similar vegetation located directly adjacent to the study area and in the broader locality. When considering the cumulative impacts from the New Public Preschool (includes the removal of 0.31 ha of PCT 3269 and loss of six hollow-bearing trees), the area of habitat is unlikely to become fragmented or isolated as the removal works are on a relatively small scale. Similar habitat will be retained adjacent to the study area and in the wider locality for this highly mobile species to access.
7.3.1(c) (iii)	In relation to the habitat of a threatened species or ecological community: The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	The proposal would impact 0.19 ha of potential foraging habitat for these microbat species. Four hollow bearing trees will be removed including two trees which offer potential roosting habitat for these species within the study area. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 and loss of six trees which contain potential roosting habitat for threatened microbats. The cumulative impacts of both activities would result in 0.5 ha of PCT 3269 being removed and loss of ten hollow-bearing trees. The area of habitat to be affected is not considered vital to the long-term survival of any of these species within the locality considering similar foraging and roosting habitat nearby.
7.3.1(d)	Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposal will not impact any declared Area of Outstanding Biodiversity Value.
7.3.1(e)	Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The proposal are associated with the KTPs: • <i>Clearing of native vegetation</i> • <i>loss of hollow-bearing trees.</i> Impacts are considered minimal as only 0.19 ha of degraded condition PCT 3269 and four hollow-bearing trees would be cleared as a result of the proposal. When considering the cumulative impacts from the New Public Preschool (includes the removal of 0.31 ha of PCT 3269 and loss of six hollow-bearing trees), the area of impact subject to these KTPs is still considered small and is unlikely to exacerbate its effect.

BC Act	Question	Response
		Further foraging resources for these highly mobile species are available within the study area and across the broader landscape.
Conclusion	Is there likely to be a significant impact?	No. The proposal is unlikely to have a significant impact on these species for the following reasons: • The area of vegetation to be affected is in poor condition. Similar habitat for these highly mobile species is available directly adjacent to the development footprint. • The species are unlikely to be fragmented as they are highly mobile and are able to access vegetation within the broader landscape. • four hollow-bearing trees (including two which may be utilised by these species) will be removed in the study area but other hollow-bearing trees will likely be retained across the site and are likely to be present in similar habitat nearby. • Better condition potential habitat is available 1.5 km south at Worrigee Nature Reserve The species are unlikely to be fragmented as they are highly mobile and can use similar vegetation in the broader landscape.

B3: *Calyptorhynchus lathami lathami* (south-eastern glossy black cockatoo)

The south-eastern glossy black cockatoo is listed as a vulnerable species on Schedule 2 of the BC Act.

The south-eastern glossy black cockatoo is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia. The Glossy Black Cockatoo inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods. Inland populations feed on a wide range of she-oaks, including *A. diminuta* (Drooping She-Oak) and *A. gymnathera*. Belah is also utilised and may be a critical food source for some populations. In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak, but also recorded in open woodlands dominated by Belah (*Casuarina cristata*). This species feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill. Glossy Black Cockatoos are dependent on large hollow-bearing eucalypts for nest sites. A single egg is laid between March and May.

There are 68 BioNet records for this species within a 5 km radius of the study area. The study area contains one hollow-bearing tree with an entrance >15 cm which may provide roosting habitat for this species. No foraging habitat in the form of *Casuarina* or *Allocasuarina*s were recorded within the study area. The study area contains marginal habitat for this species.

The proposal includes the removal of 0.19 ha of PCT 3269 which serves as potential foraging habitat for these species. This includes 0.17 ha of direct impacts to PCT 3269 and potential impacts to 0.02 ha of PCT 3269 (i.e. two additional trees) subject to root mapping. The proposed activity also will result in disturbance to 0.19 ha of groundcover which does not represent current habitat for these species.

For the purpose of this impact assessment the direct impact on foraging habitat for this species is 0.19 ha of PCT 3269 due to removal of canopy species. The recently approved New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed (non-foraging habitat), resulting in a cumulative impact of a 0.5 ha reduction in habitat for this species.

Table 16: Test of significance for South-eastern Glossy Black Cockatoo

BC Act	Question	Response
7.3.1 a)	In the case of a threatened species: whether the proposed activity or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	Factors likely to have an adverse effect on the life cycle of glossy black-cockatoo would include a substantial loss and/or fragmentation of foraging habitat and loss of suitable nesting and roosting habitat. A local viable population of this wide-ranging species is expected to have a home range that covers extensive areas within Worrigee Nature Reserve located 1.5 km south of the study area. The activity will remove one hollow-bearing tree which contains a suitable entrance size for this species. The vegetation for removal consists of 0.19 ha of PCT 3269 which does not contain foraging habitat for this species. When considering the cumulative impacts from the New Public Preschool, a further 0.31 ha of PCT 3269 will be removed which does not contain foraging habitat for this species. No suitable hollows for this species will be removed as part of the New Public Preschool activity.

BC Act	Question	Response
		The impact to potential foraging habitat is expected to be minimal, even when considering the cumulative impacts of the New Public Preschool. The study area contains fragmented and disturbed habitat which does not represent important habitat for this species. There is marginal breeding habitat present, however this hollow is not located near foraging habitat or areas of large intact vegetation. Therefore, the activity and the loss of one hollow (entrance 15-20cm) is unlikely to place a viable local population at risk of extinction.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed activity or activity: Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Not applicable. glossy black-cockatoo is not an endangered community.
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed activity or activity is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	Not applicable. glossy black-cockatoo is not an endangered community.
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed activity or activity	The proposed activity will result in the removal of 0.19 ha of PCT 3269 vegetation and loss of one hollow-bearing tree (with an entrance 15-20cm) for the construction of the new primary school. This includes two trees (tree 1 and 64) (0.02 ha of PCT 3269) which may be retained subject to root mapping. If retained, the total removal would be 0.17 ha of potential foraging habitat. An additional 0.19 ha of PCT 3269 will be retained but will be subject to ground disturbance for landscaping. No foraging habitat was identified in the form of Casuarinas or Allocasuarinas. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 which does not contain foraging habitat for this species. Therefore, the cumulative impact of both activities would include in 0.5 ha reduction in PCT 3269. The habitat to be modified under this activity, or the New Public Preschool activity, is unlikely to be of high importance to the long-term survival of the potentially affected species. This species is likely to select breeding habitat near foraging habitat and in more intact patches of native vegetation, unlike the fragmented habitat within the study area. Indirect impacts are expected to be marginal, given the size of the proposed activity.

BC Act	Question	Response
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed activity or activity	The proposed activity would remove 0.19 ha of vegetation which does not represent foraging habitat for this species. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 which does not contain foraging habitat for this species. Therefore, the cumulative impact of both activities would include in 0.5 ha reduction in PCT 3269. The glossy black cockatoo is a highly mobile species and would not be fragmented or isolated from other habitat including an expansive patch of vegetation in Worrigeer Nature Reserve located 1.5 km south of the study area. As the vegetation within study area occurs in small fragmented patches within a disturbed habitat, the proposed activity will not further fragment habitat. Therefore, the proposed activity would be unlikely to increase fragmentation given the size and location of the study area.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	The proposed activity would remove 0.19 ha of native vegetation which does not contain foraging habitat for this species. One hollow-bearing tree with a suitable size entrance has potential to provide breeding habitat for this species. The hollow-bearing tree is located along Booligal Road within a fragmented patch of highly disturbed native vegetation. Although hollows are important to the long term survival of this species, the hollow is unlikely to be considered important habitat due to the isolation from intact vegetation and foraging habitat for this species. Some canopy species will remain within the study area and continue to provide connectivity habitat for arboreal species. Therefore, the activity is unlikely to increase fragmentation throughout the landscape, as canopy species will remain along the western and northern boundary of the study area. When considering the cumulative impacts from the New Public Preschool, a further 0.31 ha of PCT 3269 will be removed which does not contain foraging habitat for this species. No suitable hollows for this species will be removed as part of the New Public Preschool activity. It is still considered unlikely that the cumulative impacts would increase fragmentation throughout the landscape as it is still a relatively small scale habitat reduction and canopy species will be retained. For these reasons, the habitat to be removed is unlikely to be important to the long-term survival of these species within the locality.
7.3.1 d)	Whether the proposed activity or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposed activity would not affect any declared area of outstanding biodiversity value.

BC Act	Question	Response
7.3.1 e)	Whether the proposed activity or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	A key threatening process which is relevant to the proposed activity for the south-eastern glossy black cockatoo includes loss of hollow-bearing trees and the clearing of native vegetation. However, with respect to this species, the proposed activity involves a negligible impact to potential foraging habitat and marginal impacts to breeding habitat. The proposed activity is unlikely to contribute significantly to this threatening process given that 0.19 ha of vegetation is proposed to be removed does not contain foraging resources for this species. One hollow-bearing tree which was identified as potential habitat will be removed. This tree is along Booligal Road in a patch of fragmented vegetation. This species prefer hollows in more intact native vegetation. Thus, this hollow is unlikely to represent important habitat for this species. When considering the cumulative impacts from the New Public Preschool, a further 0.31 ha of PCT 3269 will be removed which does not contain foraging habitat for this species. The species are highly mobile and would be able to continue foraging in similar vegetation adjacent to the study area. Both the potential foraging habitat reduction in this activity (0.19 ha) and cumulative impacts from the New Public Preschool are unlikely to exacerbate this key threatening process as it is a small scale in an already disturbed area.
Conclusion	Is there likely to be a significant impact?	With consideration to the above there is unlikely to be a significant impact to the south-eastern glossy black cockatoo.

B4: *Callocephalon fimbriatum* (gang-gang cockatoo)

The gang-gang cockatoo forages on flower buds and seed pods, but also on blossoms, leaf buds, fruits, and seeds from both native and introduced ornamental species. They are known to forage across a wide variety of Plant communities but favour those with a high density of eucalypt and acacia. This species nests in monogamous pairs and are reliant on hollows, preferably in older growth forest and woodland, and will often be close to water.

The vegetation within the study area provides marginal seasonal foraging habitat. This species migrates to the mountain region to breed and return to the coastal regions during winter to foraging. Although the study area contains three hollows with entrance class 10-20 cm which are within the suitable size class for this species, no breeding habitat was recorded within the study area due to the proximity to coastal regions. The study area is unlikely to support breeding habitat. Suitable foraging habitat is present in the form of 0.19 ha of PCT 3269, which includes winter flowering *Corymbia maculata*, which will be removed. This includes 0.17 ha of direct impacts to PCT 3269 and potential impacts to 0.02 ha of PCT 3269 (i.e. two additional trees) subject to root mapping. The proposed activity also will result in disturbance to 0.19 ha of groundcover which does not represent habitat for these species.

For the purpose of this impact assessment the direct impact on foraging habitat for this species is 0.19 ha of PCT 3269 due to removal of canopy species. The recently approved New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed, resulting in a cumulative impact of a 0.5 ha reduction in potential foraging habitat for this species.

Table 17: Test of significance for *Callocephalon fimbriatum* (gang-gang cockatoo)

BC Act	Question	Response
7.3.1 a)	In the case of a threatened species: whether the proposed activity or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	Factors likely to have an adverse effect on the life cycle of gang-gang cockatoo would include a substantial loss and/or fragmentation of foraging habitat and loss of suitable nesting and roosting habitat. A local viable population of this wide-ranging species is expected to have a home range that covers extensive areas within Worrigeer Nature Reserve located 1.5 km south of the study area. The activity will remove 0.19 ha of PCT 3269 which contain nectar foraging habitat for this species. This species migrates to mountain regions to breed in old growth forests and returns in winter to coastal regions to forage. The study area is considered a coastal region and therefore, the hollows within the study area do not represent suitable breeding habitat for this species. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 which represents potential foraging habitat for this species. The cumulative impacts of both activities would result in 0.5 ha of PCT 3269 being removed. The impact to potential foraging habitat is expected to be minimal as the study area contains fragmented and disturbed habitat which does not represent important habitat for this species. There is no breeding habitat present and marginal foraging habitat present. It is unlikely the activity would place a viable local population at risk of extinction.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered	Not applicable.

BC Act	Question	Response
	ecological community, whether the proposed activity or activity: Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed activity or activity is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.	Not applicable.
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed activity or activity	The proposed activity will result in the removal of 0.19 ha of PCT 3269 vegetation for the construction of the new primary school. This includes two trees (tree 1 and 64) (0.02 ha of PCT 3269) which may be retained subject to root mapping. If retained, the total removal would be 0.17 ha of potential foraging habitat. An additional 0.19 ha of PCT 3269 will be retained but will be subject to ground disturbance for landscaping. No breeding habitat was identified for this species. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 which represents potential foraging habitat for this species. The cumulative impacts of both activities would result in 0.5 ha of PCT 3269 being removed. This species migrates to mountain regions in tall growth forest for breeding habitat. The study area is likely to provide winter foraging habitat in the form of winter flowering species <i>Corymbia maculata</i>. There are similar patches of PCT 3269 recorded near the study area and an expansive patch of vegetation in Worrigeer Nature Reserve located 1.5 km south of the study area. The habitat to be modified under the activity is unlikely to be of high importance to the long-term survival of the potentially affected species, including when considering the cumulative impacts (0.5 ha) from the New Public Preschool. Indirect impacts are expected to be marginal, given the size of the proposed activity.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed activity or activity	The proposed activity would remove 0.19 ha of vegetation which represents foraging habitat for this species. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 which represents potential foraging habitat for this species. The cumulative impacts of both activities would result in 0.5 ha of PCT 3269 being removed. The gang-gang cockatoo is a highly mobile species and would not be fragmented or isolated from other habitat including an expansive patch of vegetation in Worrigeer Nature Reserve located 1.5 km south of the study area.

BC Act	Question	Response
		As the vegetation within study area occurs in small, fragmented patches within a disturbed habitat, the proposed activity will not further fragment habitat. Therefore, the proposed activity would be unlikely to increase fragmentation given the size and location of the study area. When considering the cumulative impacts of the New Public Primary School, it is unlikely the area of habitat is likely to become fragmented or isolated as this species is highly mobile and can access similar vegetation nearby.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	The proposed activity would remove 0.19 ha of native vegetation which does not contain breeding habitat for this species. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 which represents potential foraging habitat for this species. The cumulative impacts of both activities would result in 0.5 ha of PCT 3269 being removed. The vegetation within the study area is likely to form part of a mosaic of resources in the landscape which the gang-gang cockatoo utilises during peak flowering events. The patch of vegetation in this activity and considering the cumulative impacts is unlikely to be considered important habitat due to the absence of breeding habitat and the isolation from intact vegetation for this species. Some canopy species will remain within the study area and continue to provide connectivity habitat for arboreal species. Therefore, the activity is unlikely to increase fragmentation throughout the landscape, as canopy species will remain along the western and northern boundary of the study area. For these reasons, the habitat to be removed is unlikely to be important to the long-term survival of these species within the locality.
7.3.1 d)	Whether the proposed activity or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).	The proposed activity would not affect any declared area of outstanding biodiversity value.
7.3.1 e)	Whether the proposed activity or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	A key threatening process which is relevant to the proposed activity for the gang-gang cockatoo includes loss of hollow-bearing trees and the clearing of native vegetation. However, with respect to this species, the proposed activity involves a negligible impact to breeding habitat as this species migrates to mountain region to breed and returns to coastal areas (such as the study area) during winter to feed. The proposed activity will result in the loss of seasonal foraging resources within an urban environment. The proposed activity is unlikely to contribute significantly to this threatening process given that 0.19 ha of vegetation is proposed to be removed does not contain breeding habitat for this species. Additional foraging resources will be retained within the study area and within the broader landscape.

BC Act	Question	Response
		The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 which represents potential foraging habitat for this species. The cumulative impacts of both activities would result in 0.5 ha of PCT 3269 being removed. The species are highly mobile and would be able to continue foraging in similar vegetation adjacent to the study area. Therefore, the 0.91 ha reduction of habitat in this activity or 0.5 ha cumulative impact from the New Public Preschool is unlikely to exacerbate this key-threatening process for this species as the removal works are still relatively small scale and they are highly mobile.
Conclusion	Is there likely to be a significant impact?	With consideration to the above there is unlikely to be a significant impact to the gang-gang cockatoo.

Appendix C 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 MNES' is defined as a controlled action, and requires approval from the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW), which is responsible for administering the EPBC Act. The process includes undertaking an Assessment of Significance for listed threatened species and ecological communities that represent a matter of MNES that will be affected as a result of the proposed activity. Significant impact guidelines that outline a number of criteria have been developed by the Commonwealth of Australia (2013), to provide assistance in conducting the Assessment of Significance and help decide whether or not a referral to the Commonwealth is required.

The following MNES has been assessed as part of this assessment:

- *Pteropus poliocephalus* (grey-headed flying fox)
- *Calyptorhynchus lathami lathami* (glossy black cockatoo)
- *Callocephalon fimbriatum* (gang-gang cockatoo)

C1: *Pteropus poliocephalus* (grey-headed flying-fox)

The grey-headed flying-fox (GHFF) is listed as vulnerable under the EPBC Act and has been previously recorded within a 5 km radius of the study area (OEH 2022a). The proposed activity will potentially affect up to 0.19 ha of marginal foraging habitat (Planted Native vegetation) for this species. This includes 0.17 ha of direct impacts to PCT 3269 and potential impacts to 0.02 ha of PCT 3269 (i.e. two additional trees) subject to root mapping. The proposed activity also will result in disturbance to 0.19 ha of groundcover of retained PCT 2369 due to landscaping.

For the purpose of this impact assessment the direct impact on foraging habitat for this species is 0.19 ha of PCT 3269 due to removal of canopy species. The recently approved New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed, resulting in a cumulative impact of a 0.5 ha reduction in potential foraging habitat for this species.

GHFF present in camps within a 20 km radius of the study area may use the foraging resources available within the study area. No known GHFF camps are present within the study area. The potential foraging habitat within the impact area is marginal (*Eucalyptus* spp.) and would not be relied upon as a sole foraging resource for this species. The closest Nationally Important camp for GHFF occurs approximately 4.8 km north-west of the study area. Other smaller camps located closer to the subject area include two in Bomaderry approximately 4.9 km and 5.6 km to the north west and one in Nowra Hill approximately 6.3 km to the south west (DCCEEW 2025c).

Considering that GHFF is likely to forage on the *Eucalyptus* spp. within the study area on an occasional basis, a significance assessment has been undertaken in accordance with Significant impact guidelines 1.1 under the EPBC Act (CoA, 2013) (Table 18).

Table 18: EPBC Act Assessment for *Pteropus poliocephalus* (Grey-headed Flying-fox)

Criterion	Assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criterion a: lead to a long-term decrease in the size of an important population of a species	The Matters of National Environmental Significance Impact Guidelines 1.1 (CoA 2013) defines an important population as a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: 1. Key source populations either for breeding or dispersal 2. Populations that are necessary for maintaining genetic diversity, and/or 3. Populations that are near the limit of the species range The GHFF is considered one population due to the constant exchange of genetic material between individuals and its movement between camps throughout its entire geographic range (DCCEEW 2022c). Maternity or other roosting habitat is considered important habitat for this species. According to the National Flying-fox Monitoring Program, no GHFF camps currently occur or have ever been recorded within the study area (DCCEEW 2022b). The nearest active GHFF camp occurs at Bomaderry approximately 4.9 km north west of the study area. The proposed activity would potentially remove up to 0.19 ha of foraging habitat (PCT 3269) for this species. The New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed, resulting in a cumulative impact of a 0.5 ha reduction in potential foraging habitat for this species. The GHFF is recorded as travelling long distances (up to 40 km) on feeding forays. Given that that a large patch of similar foraging habitat is located 1.5 km south of the study area in Worrigee Nature Reserve, the removal of this potential foraging habitat, even when considering cumulative impacts, is a relatively small scale and would not lead to

Criterion	Assessment
	the long-term decrease in the size of an important population of GHFF as a highly mobile species.
Criterion b: reduce the area of occupancy of an important population	The proposed activity will reduce the extent of available foraging habitat for the GHFF. Up to approximately 0.19 ha of potential foraging habitat will potentially be removed from the study area. The canopy species identified in the study area, including <i>Corymbia maculata</i>, may provide supplementary foraging habitat for this species. The study area does not contain breeding or sheltering habitat (i.e., bat camps). The GHFF is known to fly long distances (up to 40 km per night) and move between bat camps. As such this species is likely to utilise a large extent of habitat around Worrigee Nature Reserve and adjacent lands approximate 1.5 km south of the study area. Due to the extent of habitat within a 40 km radius of the nearest known bat camps in Bomaderry Park, the removal of this native vegetation in the form of PCT 3269 is unlikely to significantly reduce the area of occupancy for this species. The New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed, resulting in a cumulative impact of a 0.5 ha reduction in potential foraging habitat for this species. This is still relatively small scale, and represents a very minor reduction in the area of occupancy.
Criterion c: fragment an existing important population into two or more populations	The proposed activity will potentially remove 0.19 ha of planted native vegetation suitable as foraging habitat for the GHFF. No camps will be affected, and other areas of foraging habitat are present in the study area. The New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed, resulting in a cumulative impact of a 0.5 ha reduction in potential foraging habitat for this species. The species is highly mobile, and the proposed activity, even when considering cumulative impacts, will not fragment an existing important population into two or more populations. Whilst the potential foraging habitat may contribute as a 'stepping stone' for this highly mobile species to other more substantial foraging habitat sites, this function is unlikely to be significantly inhibited by the proposed activity. Furthermore, this species has been recorded in urban environments and is likely to continue to forage adjacent to the study area and across the broader locality. Therefore, the proposed activity is unlikely to fragment an existing important population into two or more populations.
Criterion d: adversely affect habitat critical to the survival of a species	The <i>National Recovery Plan for the Grey-headed Flying-fox 2021</i> identifies a number of myrtaceous plants, including Important winter and spring vegetation communities are those that contain <i>Eucalyptus tereticornis</i>, <i>E. albens</i>, <i>E. crebra</i>, <i>E. fibrosa</i>, <i>E. melliodora</i>, <i>E. paniculata</i>, <i>E. pilularis</i>, <i>E. robusta</i>, <i>E. seeana</i>, <i>E. sideroxylon</i>, <i>E. siderophloia</i>, <i>Banksia integrifolia</i>, <i>Castanospermum australe</i>, <i>Corymbia citriodora</i>, <i>C. eximia</i>, <i>C. maculata</i>, <i>Grevillea robusta</i>, <i>Melaleuca quinquenervia</i> or <i>Syncarpia glomulifera</i> as important foraging resources for the GHFF. The plan also identifies habitat which contain native species used for foraging and occur within 20 km of a nationally important camp and native or exotic species used for roosting at the site of a nationally important GHFF camp as critical habitat important to the survival of the species. The study area contains native species used for foraging and is within 20 km of a nationally important camp, so is considered critical habitat. No nationally important camps will be directly affected by the proposed activity. The proposed activity will potentially remove up to approximately 0.19 ha of suitable foraging habitat (PCT 3269) for the GHFF. The New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed, resulting in a cumulative impact of a 0.5 ha reduction in potential foraging habitat for this species. However, given that this species is highly mobile (traveling up to 40 km to forage) and the abundant habitat resources within the locality, it is considered unlikely that the

Criterion	Assessment
	development, even when considering cumulative impacts, would adversely affect habitat critical to the survival of this species.
Criterion e: disrupt the breeding cycle of an important population	The proposed activity will potentially remove up to 0.19 ha of PCT 3269 identified as suitable foraging habitat for the GHFF. The proposed activity will not disrupt the breeding cycle of the GHFF given that no camps will be impacted by the proposed activity and suitable foraging habitat is likely to be available outside of the activity area. The New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed and does not contain any GHFF camps. Therefore, when considering the cumulative impacts of the activities, it is unlikely that it would disrupt the breeding cycle of an important population.
Criterion f: modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposed activity would potentially remove up to approximately 0.19 ha of potential foraging habitat for the GHFF. Additionally, the New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed, resulting in a cumulative impact of a 0.5 ha reduction in potential foraging habitat for this species. Given the small amount of foraging habitat to be removed (0.91 ha in this activity but 0.5 ha cumulative), that habitat is likely to be available outside of the study area and that this species is highly mobile, it is unlikely that the habitat to be removed would cause the species to decline. Further, according to the National Flying-fox Monitoring Program, no GHFF camps currently occur or have ever been recorded within the study area (DCCEEW 2022c). The nearest active Grey-headed Flying-fox camps occur approximately 4.9 km to the north west at Bomaberry. Therefore, no known GHFF roosting camps for this species will be impacted by the proposed activity.
Criterion g: Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposed activity is unlikely to result in the establishment of an invasive species that is harmful to the GHFF.
Criterion h: Introduce disease that may cause the species to decline	GHFF are reservoirs for the Australian bat lyssavirus which can cause clinical disease and mortality in GHFF. The species also carries and Hendra virus, although it does not cause evident clinical disease in flying-foxes. Lyssavirus infection is higher when individuals are under stress. The proposed activity would not increase the incidence of Lyssavirus, as no camps would be directly impacted, and there is other foraging habitat surrounding each nearby camp.
Criterion i: Interfere substantially with the recovery of the species	Considering the above factors, the proposed activity will not interfere substantially with the recovery of the species.
Conclusion	In consideration of the above, the proposed activity is considered unlikely to have a significant impact on the GHFF as: • No camp or habitat important to the lifecycle of this species will be impacted. • The proposed works will not result in fragmentation of habitats. • The works are small in scale (potentially up to 0.19 ha of PCT 3269 vegetation to be removed in this activity and 0.5 ha cumulatively with the New Public Preschool) • Similar foraging habitat would still be available within 20 km of the nearest Nationally Important camp, including within and immediately adjacent to the study area. As such, a referral is not recommended.

C2: *Calyptorhynchus lathami lathami* (south-eastern glossy black-cockatoo)

The south-eastern glossy black cockatoo is listed as a vulnerable species under the EPBC Act.

The south-eastern glossy black cockatoo is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia. The Glossy Black Cockatoo inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (*Allocasuarina littoralis*) and Forest Sheoak (*A. torulosa*) are important foods. Inland populations feed on a wide range of she-oaks, including *A. diminuta* (Drooping She-Oak) and *A. gymnathera*. Belah is also utilised and may be a critical food source for some populations. In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak, but also recorded in open woodlands dominated by Belah (*Casuarina cristata*). This species feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species), shredding the cones with the massive bill. Glossy Black Cockatoos are dependent on large hollow-bearing eucalypts for nest sites. A single egg is laid between March and May.

There are 68 BioNet records for this species within a 5 km radius of the study area. The study area contains one hollow-bearing tree with an entrance >15 cm which may provide roosting habitat for this species. No foraging habitat in the form of *Casuarina* or *Allocasuarina*s were recorded within the study area. The study area contains marginal habitat for this species.

The proposal includes the removal of 0.19 ha of PCT 3269 which serves as potential non-foraging habitat for these species. This includes 0.17 ha of direct impacts to PCT 3269 and potential impacts to 0.02 ha of PCT 3269 (i.e. two additional trees) subject to root mapping. The proposed activity also will result in disturbance to 0.19 ha of groundcover which does not represent current habitat for these species.

For the purpose of this impact assessment the direct impact on non-foraging habitat for this species is 0.19 ha of PCT 3269 due to removal of canopy species. The recently approved New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed (non-foraging habitat), resulting in a cumulative impact of a 0.5 ha reduction in potential habitat for this species.

An EPBC Act impact assessment has been undertaken for this species in Table 19.

Table 19: EPBC Act impact assessment for *Calyptorhynchus lathami lathami* (south-eastern glossy black-cockatoo)

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
Criteria a: lead to a long-term decrease in the size of an important population of a species		The Matters of National Environmental Significance impact guidelines states the following: <i>'An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:</i> <i>key source populations either for breeding or dispersal</i> <i>populations that are necessary for maintaining genetic diversity, and/or</i> <i>populations that are near the limit of the species range.'</i> The south-eastern glossy black cockatoo is not near the limit of its distribution. There are 68 BioNet records for this species within a 5 km radius of the study area and this species is not listed as a key population and is not an important population.

Criterion	Question	Response
		No south-eastern glossy black cockatoos were recorded within the study area. The study area does not contain potential foraging habitat as no foraging resources in the form of Casuarina or Allocasuarinas were recorded. One potential breeding tree in the form of >15 cm hollow may be impacted. The study area does not contain an important population. The action is not expected to result in a significant impact upon this species. The works will involve removal of 0.19 ha of non-foraging habitat for the proposed primary school. The vegetation is in a fragmented and disturbed condition. One suitable breeding habitat was identified for removal. The cumulative impacts from the New Public Preschool would include a further 0.31 ha of PCT 3269 will be removed which does not contain foraging habitat for this species. No suitable hollows for this species will be removed as part of the New Public Preschool activity. The study area is located approximately 1.5 km from a highly vegetated and contiguous patch of vegetation which provides ample foraging and breeding habitat for this species. Given that the action is only minor, even when considering the cumulative impacts, (0.5 ha of non-foraging habitat) in nature it is unlikely to lead to a long-term decrease in the size of an important population.
Criteria b: reduce the area of occupancy of an important population		The action is not expected to reduce the area of occupancy of an important population. The action will result in the removal of 0.19 ha of PCT 3269. The works involve removal of one potential breeding tree. A substantial amount of intact native vegetation was identified from aerial photography within Worrigeer Nature Reserve approximately 1.5 km south of the study area. The action is unlikely to reduce the occupancy of an important population. The action requires minimal vegetation removal of important habitat for this species and it is not part of an important population for this species.
Criteria c: fragment an existing important population into two or more populations		The action will not result in a fragmentation of an important population. This species occurs throughout the locality and there are numerous BioNet records in the locality which indicates this species occurs in similar vegetation adjacent to the study area. It is expected that this species will continue to utilise the vegetation within the adjacent vegetation for breeding and foraging habitat. The action will not prevent movement of this species across the landscape.
Criteria d: adversely affect habitat critical to the survival of a species		No habitat critical to the survival of this species has been declared.
Criteria e: disrupt the breeding cycle of an important population		The action does not involve impacts to breeding habitat or a substantial loss of foraging habitat near breeding habitat.
Criteria f: modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline		The action will result in removal of non-foraging habitat for the activity. One hollow-bearing tree, with a hollow entrance suitable size class, will be removed. The activity is unlikely to result in impacts which would result in a decline to this species. When considering the cumulative impacts from the New Public Preschool, a further 0.31 ha of non-foraging habitat will be removed (therefore, a total of 0.5 ha). No suitable hollows for this species will be removed as part of the New Public Preschool activity. The cumulative impacts are still small in scale and are unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.

Criterion	Question	Response
	Criteria g: result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The action will not result in invasive species that are harmful to this species becoming established.
	Criteria h: introduce disease that may cause the species to decline, or	The action is unlikely to result in introducing diseases that may cause the south-eastern glossy black cockatoo to decline.
	Criteria i: interfere substantially with the recovery of the species.	The proposed project will not substantially interfere with the recovery of this species given the proposed works are only minor in nature.
Conclusion	Is there likely to be a significant impact?	No. As such, a referral is not recommended.

C3: *Callocephalon fimbriatum* (gang-gang cockatoo)

The gang-gang cockatoo is listed as an endangered species under the EPBC Act.

This species forages on flower buds and seed pods, but also on blossoms, leaf buds, fruits, and seeds from both native and introduced ornamental species. They are known to forage across a wide variety of Plant communities but favour those with a high density of eucalypt and acacia. This species nests in monogamous pairs and are reliant on hollows, preferably in older growth forest and woodland, and will often be close to water.

The vegetation within the study area provides marginal seasonal foraging habitat. This species migrates to the mountain region to breed and return to the coastal regions during winter to foraging. Although the study area contains three hollows with entrance class 10-20 cm which are within the suitable size class for this species, no breeding habitat was recorded within the study area due to the proximity to coastal regions. The study area is unlikely to support breeding habitat. Suitable foraging habitat is present in the form of 0.19 ha of PCT 3269 which will be removed. This includes 0.17 ha of direct impacts to PCT 3269 and potential impacts to 0.02 ha of PCT 3269 (i.e. two additional trees) subject to root mapping. The proposed activity also will result in disturbance to 0.19 ha of groundcover of retained PCT 2369 due to landscaping.

For the purpose of this impact assessment the direct impact on foraging habitat for this species is 0.19 ha of PCT 3269 due to removal of canopy species. The recently approved New Public Preschool would result in an additional 0.31 ha of PCT 3269 being removed, resulting in a cumulative impact of a 0.5 ha reduction in potential foraging habitat for this species.

An EPBC Act impact assessment has been undertaken for this species in Table 20.

Table 20: EPBC Act impact assessment for *Callocephalon fimbriatum* (gang-gang cockatoo)

Criterion	Assessment
An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
a) lead to a long-term decrease in the size of a population	The gang-gang cockatoo was not recorded in the development site and is unlikely to occur there on a regular basis due to seasonal flowering and lack of breeding resources. There are no records within or close to the study area. This species is known to migrate to mountain regions to breed and return to coastal areas in winter to forage. Therefore, it is assumed no breeding habitat is present within the study area due to the coastal location of the study area.

Criterion	Assessment
	The proposed activity would affect 0.19 ha of native vegetation, which contains marginal foraging resources (seeds and fruit) for the gang-gang cockatoo. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 which represents potential foraging habitat for this species. The cumulative impacts of both activities would result in 0.5 ha of PCT 3269 being removed. Given the availability of similar and higher quality habitat within the surrounding environment, the removal of this small section of potential foraging habitat (up to 0.5 ha when considering cumulative impacts) would not lead to the long-term decrease in the size of a population of the gang-gang cockatoo.
b) reduce the area of occupancy of the species	The area of occupancy for the gang-gang cockatoo is estimated to be about 30,000 square km (DAWE, 2022). The proposed activity would affect 0.19 ha of marginal foraging habitat for this species. The gang-gang cockatoo may occasionally forage within the development site as part of a much larger range. The removal of a small and unimportant area of potential occasional foraging habitat would not reduce the area of occupancy of the Gang-gang cockatoo. The New Public Preschool will include a reduction of 0.31 ha of PCT 3269 which represents potential foraging habitat for this species. The cumulative impacts of both activities would result in 0.5 ha of PCT 3269 being removed. This is still considered small scale and would not significantly reduce the area of occupancy of the species.
c) fragment an existing population into two or more populations	The NSW Scientific Committee (2008) describes the Southern NSW population as one semi nomadic population that migrates within its range throughout the year. This species is highly mobile, and the removal of 0.19 ha of marginal foraging habitat will not fragment an existing population. When considering the cumulative impacts from the New Public Preschool, this will result in up to 0.5 ha reduction in marginal foraging for the species. As they are highly mobile, the scale of this vegetation remains unlikely to fragment an existing population into two or more populations.
d) adversely affect habitat critical to the survival of a species	No critical habitat is described for the gang-gang cockatoo, however the NSW Scientific Committee (2008) and the DAWE (2022) outline habitat that is important for this species as: • Hollow Bearing trees, particularly older stands • Forest and woodland on rich soils and gentle terrain • Eucalypt and Acacia vegetation The proposed activity will not impact breeding habitat (due to the coastal location and absence of older stands). The foraging resources to be removed are contained within a highly modified urban area and do not make up part of any intact or remnant woodlands or forest.
e) disrupt the breeding cycle of a population	The proposed activity would not disrupt the breeding cycle of the gang-gang cockatoo as no breeding habitat (mountain areas) will be affected. The proposed impact to foraging habitat is small (0.19 ha) and substantial resources will remain available within the wider area, and no breeding habitat will be impacted. The proposed activity therefore would not affect the breeding cycle of a gang-gang cockatoo population. Additionally, the New Public Preschool will not remove any breeding habitat and includes similar small scale vegetation removal (0.31 ha). Therefore, the cumulative impacts of both activities is unlikely to significantly disrupt the breeding cycle of a population.
f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to	The proposed activity would remove 0.19 ha of potential foraging habitat for the gang-gang cockatoo. It is unlikely that the extent of this vegetation removal would cause the species to decline because extensive areas of suitable habitat is available

Criterion	Assessment
the extent that the species is likely to decline	within the locality and the activity will not hinder the species access to these resources. When considering the cumulative impacts from the New Public Preschool, a further 0.31 ha of marginal foraging habitat will be removed (therefore, a total of 0.5 ha). No suitable hollows for this species will be removed as part of the New Public Preschool activity. The cumulative impacts are still small in scale and are unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.
g) result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	The proposed activity is unlikely to result in an increase of invasive species, such as the Common Myna bird that competes aggressively for breeding hollows. The study area is already heavily modified, within a developed urban context.
h) introduce disease that may cause the species to decline, or	The proposed activity will not introduce disease that will impact gang-gang cockatoos. This species is susceptible to <i>Psittacine</i> cirovirus disease (PCD) which is spread between birds of the same and differing species, particularly when feeding in flocks. gang-gang cockatoos are unlikely to forage in this way and prefer to feed in small family groups. The proposed activity will not increase the transmission or incidence of PCD in the region.
i) Interfere with the recovery of the species.	The proposed activity would remove a small amount (0.19 ha) of marginal foraging habitat for this species. This would not interfere with the recovery of the species given the extent of available foraging habitat in the vicinity and given that no breeding habitat or otherwise important habitat will be impacted. When considering the cumulative impacts from the New Public Preschool, a further 0.31 ha of marginal foraging habitat will be removed (therefore, a total of 0.5 ha). No suitable hollows for this species will be removed as part of the New Public Preschool activity. The cumulative impacts are still small in scale and are unlikely to significantly Interfere with the recovery of the species.
Is there likely to be a significant impact?	No. The proposed activity is unlikely to have a significant impact on the gang-gang cockatoo. As such, a referral is not recommended.

Appendix D Vegetation Integrity Plot

Table 21: Flora species recorded in the vegetation plot

Species Name	Common Name	Exotic (*)	Cover	Abundance
<i>Corymbia maculata</i>	spotted gum		30	13
<i>Eucalyptus</i> sp.			5	1
<i>Melaleuca decora</i>	white-feather honeymyrtle		2	1
<i>Pittosporum undulatum</i>	native daphne		1	1
<i>Cupaniopsis anacardioides</i>	tuckeroo		1	1
<i>Trifolium repens</i>	white clover	*	2	100
<i>Cyperus Eragrostis</i>	umbrella sedge	*	0.5	50
<i>Plantago lanceolata</i>	lamb's tongues	*	1	50
<i>Commelina cyanea</i>	scurvy weed		2	100
<i>Hypochaeris radicata</i>	catsear	*	1	100
<i>Dichondra repens</i>	kidney weed		2	100
<i>Paspalum dilatatum</i>	paspalum	*	30	500
<i>Axonopus fissifolius</i>	narrow-leafed carpet grass	*	20	500
<i>Sporobolus africanus</i>	parramatta grass	*	10	200
<i>Oxalis</i> sp.		*	0.1	50
<i>Gamochaeta purpurea</i>	purple cudweed	*	0.1	20
<i>Geranium</i> sp.			0.5	50
<i>Asparagus aethiopicus</i>	asparagus fern	*	5	20
<i>Cyclosporum</i> sp.			0.1	5
<i>Senecio madagascariensis</i>	fireweed	*	0.1	2
<i>Lobelia purpurea</i>	whiteroot		0.5	50
<i>Cenchrus clandestinus</i>	kikuyu grass	*	10	50
<i>Sida rhombifolia</i>	paddy's lucerne	*	0.1	10
<i>Briza</i> sp.		*	0.1	10
<i>Anthropodium milleflorum</i>	pale vanilla-lily		0.1	25
<i>Glycine clandestina</i>			0.2	200
<i>Entolasia stricta</i>	wiry panic		0.1	50
<i>Setaria parviflora</i>		*	5	50
<i>Bryophyllum</i> sp.		*	1	50
<i>Bidens pilosa</i>	cobblers pegs	*	0.2	50
<i>Chlorophytum comosum</i>	spider plant	*	1	1
<i>Passiflora</i> sp.		*	0.2	20
<i>Carex inversa</i>			0.5	100