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Flora and Fauna Assessment Report

Ryde Secondary College, NSW 2112

Report prepared by Narla Environmental

for Lipman Pty Ltd

September 2022



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Report:	Flora and Fauna Assessment Report – Ryde Secondary College, NSW 2112
Prepared for:	Lipman
Prepared by:	Narla Environmental Pty Ltd
Project no:	LIP1
Date:	September 2022
Version:	Final v1.0

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Document Control

Revision	Document Name	Issue Date	Internal Document Review
Draft v1.0	Flora and Fauna Assessment Report – Ryde Secondary College, NSW 2112	24/08/2022	Chris Moore Alex Graham
Draft v2.0	Flora and Fauna Assessment Report – Ryde Secondary College, NSW 2112	24/08/2022	Chris Moore
Final v1.0	Flora and Fauna Assessment Report – Ryde Secondary College, NSW 2112	12/09/2022	Chris Moore

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Glossary

Acronym/ Term	Definition
asl	Above sea level
BAM	Biodiversity Assessment Methodology
BC Act	New South Wales Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
DAWE	Department of Agriculture, Water and the Environment
DEC	Department of Environment and Conservation
DEE	Department of the Environment and Energy
DPE	Department of Planning and Environment (formally DPIE and OEH)
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment (now known as the DPE)
EEC	Endangered Ecological Community
EP&A Act	Environmental Planning & Assessment Act 1979
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
FFA	Flora and Fauna Assessment
ha	Hectares
km	Kilometres
LGA	Local Government Area
m	metres
mm	millimetres
NSW	New South Wales
OEH	Office of Environment and Heritage (now known as the DPE)
RDCP	Ryde Development Control Plan 2014
RLEP	Ryde Local Environmental Plan 2014
SEPP	State Environmental Planning Policy
SRZ	Structural Root Zone
Subject Site	All areas associated with the proposed activity
TEC	Threatened Ecological Community
Threatened species, populations and ecological communities	Species, populations and ecological communities specified in Schedules 1 and 2 of the BC Act 2016
TPZ	Tree Protection Zone

1. Introduction

1.1 Purpose of the Report

This report forms part of an environmental assessment under Part 5 of the *Environmental Planning and Assessment Act, 1979* for proposed upgrades to Ryde Secondary College. The proposed works are deemed permitted without consent by Section 3.37 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* which provides that:

- (1) Development for any of the following purposes may be carried out by or on behalf of a public authority without development consent on land within the boundaries of an existing school –
- (a) Construction, operation or maintenance, more than 5 metres from any property boundary with land in a residential zone and more than 1 metre from any property boundary with land in any other zone, of –
 - (ii) a portable classroom (including a modular or prefabricated classroom that is not more than 2 storeys high
 - (b) Minor alterations and additions
 - (e) demolition of structures or buildings

1.2 Ryde Secondary College

Ryde Secondary College is located at 5 Malvina Street, Ryde (Lot 284 and 285 in DP752035) within the City of Ryde Local Government Area. Ryde Secondary College has approximately 1,362 students currently enrolled. An aerial photograph of the site is provided in **Figure 1** below. Existing development includes single and double storey classrooms buildings, a multipurpose hall, covered outdoor learning areas, sports courts, demountable classrooms, landscaping, pathways and hardstand areas, vehicle circulation and carparking.

The site has frontage to Malvina Street (north-western boundary) and Forrest Road (north-eastern boundary) with low density residential development along the opposite road frontages. The site adjoins low density residential on the south-western boundary, Buffalo Creek along the southern boundary and Barton Reserve along the south-eastern boundary.



Figure 1. Aerial photograph.

1.3 Proposed Upgrades

The scope of works subject to this environmental assessment are known as Stage 1 works in the master-planned redevelopment of Ryde Secondary College. Stage 1 works include:

- Demolition in the vicinity of the proposed pavilion;
- Two (2) storey pavilion building comprising:
 - Thirteen (13) GLS;
 - Learning commons;
 - Fitness lab;
 - Seminar spaces;
 - Staff room;
 - Store; and
 - Change rooms;
- Lift, stair and ramp access;
- Associated adjustments to the existing sports court; and
- Removable of demountable classrooms.

1.4 Assessment Overview

Narla Environmental Pty Ltd (Narla) was engaged by Lipman Pty Ltd ('the proponent') to undertake a Flora and Fauna Assessment (FFA) for proposed upgrades to Ryde Secondary College (the 'Subject Property'; **Figure 2**). Collectively, all areas associated with the proposed activity will hereafter be referred to as the 'Subject Site' (**Figure 2**).

Narla have produced this report in order to assess any potential impacts associated with the proposed activity on terrestrial ecology (biodiversity), particularly threatened species, populations and ecological communities listed under the *Biodiversity Conservation Act 2016* (BC Act). The report will also recommend appropriate measures to mitigate any potential impacts in line with all relevant *State Environmental Planning Policies* (SEPPs) and local government plans, namely the *Ryde Local Environmental Plan 2014* (RLEP) and *Ryde Development Control Plan 2014* (RDCP).

1.5 Topography, Geology and Soil

The Subject Site occurs on a south facing slope with an elevation of approximately 44m above sea level (asl) in the north and 21m asl in the south. The Subject Site is situated primarily on the 'Glenorie' soil landscape which is characterised by undulating to rolling low hills on Wianamatta Group shales. Local relief 50–80 m, slopes 5–20%. Narrow ridges, hillcrests and valleys. Extensively cleared tall open-forest (wet sclerophyll forests). Soils are shallow to moderately deep (<100 cm) Red Podzolic Soils (Dr2.11) on crests; moderately deep (70–150 cm) Red and Brown Podzolic Soils (Dr2.11, Dr2.21, Db1.11, Db1.21) on upper slopes; deep (>200 cm) Yellow Podzolic Soils (Dy5.11) and Gleyed Podzolic Soils (Dg4.11) along drainage lines (DPE 2020).

The southern portion of the Subject Site is situated on the Lane Cove soil landscape, which is characterised by level to gently undulating alluvial floodplain draining both the Wianamatta Group shales and Hawkesbury Sandstone. Local relief <5 m, slopes <5%. Partially cleared tall open-forest with disturbed grass understorey (DPE 2020).

1.6 Hydrology

The Subject Site contains no mapped watercourses or waterbodies. No additional unmapped water features were observed within the Subject Site. Buffalo Creek, a first order stream, runs west to east along the southern boundary of the Subject Property (**Figure 2**).

1.7 Scope of Assessment

The objectives of this FFA were to:

- Establish the likelihood of occurrence of migratory species, threatened species, endangered populations and threatened ecological communities as listed under the BC Act and/or the EPBC Act;
- Assess any potential impacts to species and/or communities listed under the BC Act and EPBC Act;
- Identify and map the distribution of vegetation communities within the Subject Site;
- Record presence and the extent of any known or potential fauna habitat features such as nests, dreys, caves, crevices, culverts, pools, soaks, flowering trees, fruiting trees or hollow-bearing trees and provide recommendations for on-going management of these habitat features and any fauna present;
- Record presence and the extent of any Priority Weeds or weed infestations and provide recommendations for on-going management; and
- Recommend any controls or additional actions to be taken to protect or improve environmental outcomes of the proposed activity.

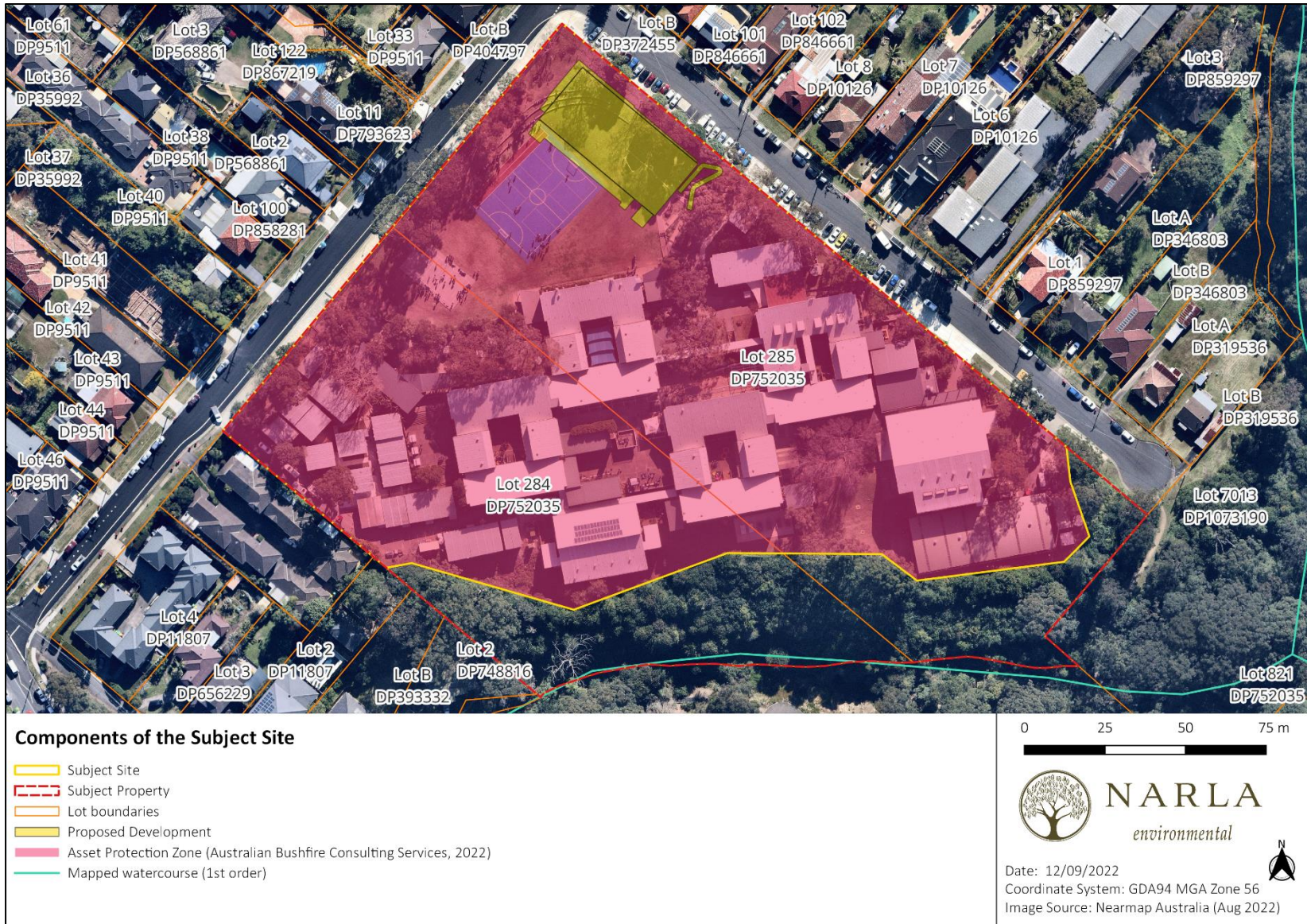


Figure 2. Components of the Subject Property and Subject Site

1.8 Study Limitations

This study was not intended to provide a complete inventory of all flora and fauna species with potential to occur within the Subject Site. The species list provided for the Subject Site within this report was restricted to what was observed during the site assessment by the Narla Ecologist. The timing of the survey may not have coincided with emergence times of some species of flora and fauna, such as seasonally flowering herbs, seasonal migratory fauna or nocturnal fauna. To account for those species that could not be identified during the site assessment, detailed habitat assessments were combined with desktop research and local ecological knowledge to establish an accurate prediction of the potential for such species to occur on or adjacent the Subject Site.

2. Relevant Legislation and Policy

The legislation and policy that are addressed in this report are listed in **Table 1**.

Table 1. Relevant legislation and policy addressed.

Legislation/Policy		Relevant Ecological Feature on Site	Triggered	Action Required
<i>Environmental Planning and Assessment Act 1979 (EP&A Act)</i>		All threatened species, populations and ecological communities and their habitat that occur or are likely to occur within the Subject Site during a part of their lifecycle.	Yes	This FFA and all subsequent recommendations relevant to the planning process under Part 5 'Infrastructure and environmental impact assessment'.
<i>Biodiversity Conservation Act 2016 (BC Act) (New South Wales)</i>		No BC Act Threatened Ecological Communities were identified within the Subject Site. No BC Act threatened species were identified within the Subject Site during the site assessment. Threatened fauna may use the site for foraging.	Yes	This FFA, particularly the likelihood tables for threatened fauna and flora species occurring or potentially occurring within the Subject Site, as well as severity of potential impacts.
<i>Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) (Commonwealth)</i>		No EPBC Act Threatened Ecological Communities were identified within the Subject Site. No EPBC Act threatened species were identified within the Subject Site during the site assessment. Threatened fauna may use the site for foraging.	Yes	This FFA, particularly the likelihood tables for threatened fauna and flora species occurring or potentially occurring within the Subject Site, as well as severity of potential impacts.
<i>Biosecurity Act 2015 (Bio Act)</i>		Two priority weeds for the Greater Sydney area were observed within the Subject Site, including: <ul style="list-style-type: none"> ▪ <i>Lantana camara</i> (Lantana); and ▪ <i>Asparagus aethiopicus</i> (Ground Asparagus). 	Yes	Listed priority weeds must be managed in accordance with the Biosecurity Act 2015.
<i>State Environmental Planning Policy (Resilience and Hazards) 2021</i>		The Subject Site does not contain areas mapped as 'Coastal Wetlands', 'Littoral Rainforest' or any other areas on the Coastal Management mapping. As such Chapter 2 – Coastal Management of this SEPP does not apply to the Subject Site.	No	None.
<i>State Environmental Planning Policy (Biodiversity</i>	Chapter 4 – Koala habitat protection 2021	The Subject Site does not occur within a Local Government Area listed in Schedule 2 of this SEPP. Therefore, this SEPP does not apply to the proposed activity.	No	None.

Legislation/Policy		Relevant Ecological Feature on Site	Triggered	Action Required
<i>and Conservation SEPP) 2021</i>	Chapter 6— Bushland in Urban Areas	The Subject Site occurs within an area specified in Schedule 5 of the SEPP, and contains bushland zoned or reserved for public open space purposes.	Yes	The applicable clauses of the SEPP have been addressed in this FFA (see Section 2.4).
Water Management Act 2000		The Subject Site occurs on waterfront land. Section 91E (1) of the WM Act identifies that it is an offence to carry out a controlled activity in, on or under waterfront land without gaining a controlled activity approval. However, under Clause 41 of the Water Management (General) Regulation 2018 (WM Reg) public authorities are exempt from Section 91E (1) of the WM Act, and therefore do not require any approvals for controlled activities on waterfront land.	No	None.

2.1 Biodiversity Assessment Pathway

Activities requiring an environmental assessment under Part 5 of the EP&A Act 1979 are to consider biodiversity as part of the environmental assessment process. The test of significance (under s.7.3 of the BC Act) determines whether the proposed activity is likely to significantly affect threatened species, ecological communities or their habitats. If the activity is likely to have a significant impact, or will be carried out in a declared Area of Outstanding Biodiversity Value (AOBV), the proponent can opt into the Biodiversity Offsets Scheme (BOS) or instead prepare a species impact statement (SIS).

The environmental impact of activities that will not have a significant impact on threatened species will continue to be assessed under Section 5.5 of the EP&A Act. The proposed activity is considered unlikely to result in a significant impact to threatened species, ecological communities or their habitats.

2.2 Ryde Local Environmental Plan 2014 (RLEP)

2.2.1 Zoning

The Subject Site is zoned 'SP2: Infrastructure'. The RLEP requires that the proposed activity satisfies the zone objectives which are:

- To provide for infrastructure and related uses;
- To prevent development that is not compatible with or that may detract from the provision of infrastructure; and
- To ensure the orderly development of land so as to minimise any adverse effect of development on other land uses.

The aim of the proposed activity is to improve the facilities available to students at the secondary college. This aim satisfies the objectives for the zones.

2.3 Ryde Development Control Plan 2014 (RDCP)

2.3.1 Tree Preservation

Effective management of trees as a natural resource and as part of the urban infrastructure of the City of Ryde depends upon the long term retention of existing trees, appropriate tree maintenance, protection of trees on development sites, and in relation to replacement trees, suitable tree location and considered species selection. The objectives of this part are:

- To maximise a sustainable Urban Forest canopy across the City of Ryde;
- To conserve trees of ecological, heritage, aesthetic and cultural significance;
- To protect and manage individual trees as an important community asset;
- To establish the procedural framework and requirements governing the pruning, removal;
- and subsequent replacement of trees within the City of Ryde;
- To ensure all new development considers existing trees on the development site; and
- provides opportunity for the healthy growth of large trees.

Development controls which apply to this part of the RDCP include:

- All reasonable efforts are to be taken to protect trees from damage during construction. Such measures should include:
 - i. clearly marking trees to remain;
 - ii. avoiding compaction of ground around these trees (generally caused by vehicles driving through these areas); and
 - iii. avoiding stockpiling of material within the dripline of these trees.
- Tree protection zones are to be fenced off to ensure that they are not disturbed and to prevent vehicles, building materials, and refuse being placed in those locations.
- Fences for tree protection zones are to be erected prior to any demolition or construction work being undertaken. Areas on the building site that are affected by tree roots on an adjoining private or public property should be similarly fenced off.
- Trees that are to remain on the site are to be protected against damage during construction.
- All mature trees to remain shall be clearly marked and a 1.8-metre high chainwire fence attached to 50 mm steel posts erected around their dripline or a minimum of 4 metres from the trunk where a structure is to be constructed under the canopy. A qualified arborist shall inspect the tree protection measures and issue a Compliance Certificate to indicate that if maintained, the tree protection measures will provide sufficient protection during normal construction activities.
- Installation of Services:
 - Trenches for services shall be located outside the dripline of all trees that must be retained on the property and all trees on adjoining public and private lands. If this is not possible, the services, including stormwater pipelines, shall be hand dug under the trees roots. At any time where a pipe is being laid within the dripline of a tree that is to be retained, or the dripline of a tree on an adjoining property, a qualified arborist must be on-site to oversee the operation.
- Cutting of Roots:
 - All roots in excess of 25 mm that shall be severed, cleanly cut (not with a backhoe bucket), be kept moist at all times, and not be left exposed to the air.

The proposed activity will require the removal of one tree.

2.4 State Environmental Planning Policy (Biodiversity and Conservation) 2021 – Chapter 6: Bushland in Urban Areas

Chapter 6 of SEPP (Biodiversity and Conservation) 2021 – Bushland in Urban Areas applies to the areas specified in Schedule 5 of the SEPP that adjoin bushland zoned or reserved for public open space purposes. This SEPP applies to the Subject Site as:

- The City of Ryde is listed in Schedule 5 'Areas and part areas to which the Policy applies'; and
- The Subject Site adjoins bushland zoned or reserved for public open space purposes.

The following provisions of the SEPP therefore apply to the Subject Site.

Where a public authority:

- Proposes to carry out development on land to which this clause applies; or
- Proposes to grant approval or development consent in relation to development on land to which this clause applies,

The public authority shall not carry out that development or grant the approval or development consent unless it has taken into account:

- The need to retain any bushland on the land;
- The effect of the proposed development on bushland zoned or reserved for public open space purposes and, in particular, on the erosion of soils, the siltation of streams and waterways and the spread of weeds and exotic plants within the bushland; and
- Any other matters which, in the opinion of the approving or consent authority, are relevant to the protection and preservation of bushland zoned or reserved for public open space purposes.

Where the council considers it necessary or desirable to provide more detailed provisions than are contained in this Chapter, it may prepare or cause to be prepared a plan of management in respect of bushland to which this section applies.

The proposed activity will impact two native trees, which have been planted, and exotic dominated groundcovers. There is unlikely to be any change to the existing condition of the site (i.e. increase in soil erosion, siltation of streams and the spread of weeds) owing to the placement of the proposed activity away from any watercourses and in an area dominated by exotic vegetation.

3. Methodology

3.1 Desktop Assessment and Literature Review

A thorough literature review of local information relevant to the City of Ryde LGA was undertaken. Searches using NSW Wildlife Atlas (BioNet; DPE 2022b) and the Commonwealth Protected Matters Search Tool (DCCEEW 2022) were conducted to identify all current threatened flora and fauna, as well as migratory fauna records within a 10km x 10km cell search area centred on the Subject Site. These data were used to assist in establishing the presence or likelihood of any ecological values as occurring on or adjacent the Subject Site and helped inform our Ecologist on what to look for during the site assessment.

Soil landscape and geological mapping was examined to gain an understanding of the environment on the Subject Site and assist in determining whether any threatened flora or ecological communities may occur there (DPE 2020).

3.2 Ecological Site Assessment

3.2.1 General Survey

A site assessment was undertaken by Ecologist, Jack Tatler, on Thursday the 11th and 18th of August 2022. During the site assessment, the following activities were undertaken:

- Identifying and recording the vegetation communities present within the Subject Site, with focus on identifying any threatened ecological communities;
- Recording a detailed list of flora species encountered within the Subject Site, with a focus on threatened species, species diagnostic of threatened ecological communities and Priority Weeds;
- Recording opportunistic sightings of any fauna species seen or heard on or within the immediate surrounds of the Subject Site;
- Targeted surveys for threatened flora;
- Identifying and recording the locations of notable fauna habitat such as important nesting, roosting or foraging microhabitats;
- Assessing the connectivity and quality of the vegetation within the Subject Site and surrounding area; and
- Targeting the habitat of any threatened and regionally significant fauna including:
 - Tree hollows (habitat for threatened large forest owls, parrots and arboreal mammals);
 - Caves and crevices (habitat for threatened reptiles, small mammals and microbats);
 - Termite mounds (habitat for threatened reptiles);
 - Soaks (habitat for threatened frogs);
 - Wetlands (habitat for threatened fish, frogs and water birds);
 - Drainage lines (habitat for threatened fish and frogs);
 - Fruiting trees (food for threatened frugivorous birds and mammals);
 - Flowering trees (food for threatened nectarivorous birds and mammals);
 - Trees and shrubs supporting nest structures (habitat for threatened birds and arboreal mammals); and
 - Any other habitat features that may support fauna (particularly threatened) species.

3.2.2 Weather Conditions

Weather conditions recorded at the nearest weather station (Sydney Olympic Park, NSW) prior to and during the site assessment are provided in **Table 2** (BOM 2022). The data revealed minor rainfall and mild temperatures leading up to the survey. These weather conditions were conducive to the emergence of annual herbs.

Table 2. Weather conditions recorded at Sydney Olympic Park, NSW (station 066212) preceding and during the site assessment (site assessment date in bold).

Survey date	Day	Minimum Temp. (°C)	Maximum Temp. (°C)	Rainfall (mm)
4/08/2022	Thursday	14.0	21.4	0
5/08/2022	Friday	14.3	22.9	1.2
6/08/2022	Saturday	10.2	20.5	0
7/08/2022	Sunday	7.4	19.4	0
8/08/2022	Monday	6.8	17.1	0
9/08/2022	Tuesday	5.5	16.5	0
10/08/2022	Wednesday	8.2	17.1	2.6
11/08/2022	Thursday	6.6	17.1	0

3.2.3 Mapping and Analysis of Vegetation Communities

Narla examined local satellite imagery, geological mapping, soil landscape mapping and topographic mapping, in addition to existing vegetation mapping (OEH 2016a) in order to stratify the Subject Site and guide the site assessment survey efforts. The following resources were consulted during the site assessment to assist with the identification of vegetation communities present within the Subject Site:

- eSPADE v2.1 (DPE 2022e);
- Soil Landscapes of the Sydney 1:100,000 sheet (DPE 2020);
- The Native Vegetation of the Sydney Metropolitan Area - Version 3.1, VIS_ID 4489 (OEH 2016a); and
- The Native Vegetation of the Sydney Metropolitan Area. Volume 2: Vegetation Community Profiles (OEH 2016b).

4. Native Vegetation

4.1 Vegetation Community

4.1.1 Historically Mapped Vegetation Communities

Two (2) vegetation communities have been historically mapped within the Subject Site (OEH 2016b; **Figure 3**):

- Urban Exotic/Native; and
- PCT 1841: Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region.

4.1.2 Field-validated Vegetation Communities

The field survey conducted by the Narla Ecologist identified the vegetation within the Subject Site best conformed to the following vegetation communities/ Plant Community Types (PCT; **Figure 4**):


- PCT 1841: Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region;
- Exotic Dominated Groundcover; and
- Exotic/Native Landscaping.

The vegetation communities identified within the Subject Site are detailed in, **Table 3**, **Table 4**, and **Table 5**.



Figure 3. Historically mapped vegetation communities within the Subject Site.

Table 3. Description of PCT 1841 within the Subject Site.

PCT 1841: Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region	
	
Vegetation Formation/Keith Class	North Coast Wet Sclerophyll Forests
Extent within Subject Site (approximate)	0.44ha
Extent to be impacted (approximate)	0.01ha
Description of the Vegetation within this Zone	
<p>This vegetation zone was characterised by a native canopy of <i>Angophora costata</i>, <i>Syncarpia glomulifera</i>, <i>Lophostemon confertus</i>, <i>Eucalyptus citriodora</i>, <i>Corymbia maculata</i> and <i>Eucalyptus saligna</i>. The mid stratum included the native species <i>Pittosporum undulatum</i>, <i>Breynia oblongifolia</i> and <i>Cyathea</i> spp. The ground layer was heavily degraded and characterised mainly by mowed turf, with one small area of ferns that included <i>Nephrolepis cordifolia</i>, <i>Adiantum aethiopicum</i>, <i>Christella dentata</i>, <i>Pteridium esculentum</i> and <i>Asplenium australasicum</i>.</p>	
Description (BioNet)	
<p>Coastal Enriched Sandstone Moist Forest is a tall open eucalypt forest with a distinctive mesic shrub and small tree layer. The canopy may be dominated by various combinations of eucalypts although smooth-barked apple</p>	

PCT 1841: Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region

(*Angophora costata*) is invariably present. On the north shore and inner harbours Turpentine (*Syncarpia glomulifera*), Blackbutt (*Eucalyptus pilularis*) and Sydney Blue Gum (*Eucalyptus saligna*) are dominant trees while on the Warringah and Pittwater escarpments Bangalay (*Eucalyptus botryoides*) and mahoganies (*Eucalyptus umbra/scias*) are more prevalent. Elsewhere, Sydney Peppermint (*Eucalyptus piperita*) may dominate. A tall stand of Forest Oak (*Allocasuarina torulosa*) is often present below the eucalypt canopy. Tall small trees tend to be rainforest plants such as Coachwood (*Ceratopetalum apetalum*), Blueberry Ash (*Elaeocarpus reticulatus*) and occasionally Cabbage Tree Palms (*Livistona australis*). The forest floor is covered by a sparse to dense cover of ferns and twiners.

The distribution of this forest is widespread though patchy across the Sydney area. Typically it is situated in sandstone gullies and sheltered slopes enriched by clay material. This material is sourced from shale bands in the sandstone bedrock associated with Narrabeen sandstone on the Pittwater escarpment or Hawkesbury sandstone in the Lane Cove River valley. At other places the material is sourced from shale caps situated on ridgelines above the creek. Outcropping rocks and benches are common. It occurs at elevations between 10 and 120 metres above sea level and mean annual rainfall of 850-1250mm per annum. A small disjunct location occurs in a shale-enriched gully near Campbelltown.

	Characteristic Flora Species	Geology and Geography
Justification of Vegetation Assignment	The vegetation within this area contained the diagnostic dominant canopy species <i>Angophora costata</i> and <i>Syncarpia glomulifera</i> as well as several mid stratum species.	Occurs on sandstone gullies and sheltered slopes enriched by clay. The site occurs in a gully with some sandstone evident and is also on a slope, which has clay enriched soils.
BC Act 2016 Status	Not listed	
EPBC Act 1999 Status	Not listed	
References	OEH (2016) The Native Vegetation of the Sydney Metropolitan Area Version 2.0 NSW Office of Environment and Heritage Sydney.	

Table 4. Description of Exotic Dominated Groundcover identified within the Subject Site.


Exotic Dominated Groundcover	
	
Extent within Subject Site (approximate)	0.48ha
Extent to be impacted (approximate)	0.11ha
Description of the Vegetation within the Subject Site	
<p>This vegetation zone was severely degraded and was characterised by common lawn grasses and forbs (native and exotic) such as <i>Poa annua</i>, <i>Cenchrus clandestinus</i>, <i>Cynodon dactylon</i>, <i>Sporobolus creber</i>, <i>Modiola caroliniana</i>, <i>Soliva sessilis</i>, <i>Cerastium glomeratum</i>, <i>Trifolium repens</i>, <i>Plantago lanceolata</i>, <i>Cardamine</i> spp., and <i>Taraxicum officinale</i> as well as areas dominated by exotic forbs, scramblers and small shrubs including <i>Solanum nigrum</i>, <i>Asparagus aethiopicus</i>, <i>Bidens pilosa</i>, <i>Rumex sagittatus</i>, <i>Ipomoea indica</i> and <i>Tradescantia fluminensis</i>. The upper and mid storey was absent.</p>	
Justification of Vegetation Assignment	The vegetation within this area consisted of planted native and exotic vegetation, and invasive weeds. As the vegetation could not be assigned to a locally occurring native community it has been classified Exotic Dominated Groundcover.
BC Act 2016 Status	N/A
EPBC Act 1999 Status	N/A
References	N/A

Table 5. Description of Exotic/Native Landscaping within the Subject Site.


Exotic/Native Landscaping	
	
Extent within the Subject Site (approximate)	0.15ha
Extent to be impacted (approximate)	0ha
Description of the Vegetation within the Subject Site.	
<p>The vegetation within this zone consists of planted exotic species, and native cultivars, in garden beds. Native species included Callistemons, Melaleucas, Grevilleas, Lilly Pillys, Hakeas, Acacias, Banksias, <i>Hardenbergia violacea</i>, <i>Bursaria spinosa</i>, <i>Lomandra longifolia</i> and juvenile eucalypts. Exotic species included <i>Pinus</i> spp., <i>Rhaphiolepis</i> spp., Gardenias, Camellias, <i>Lex cornuta</i>, <i>Liriope muscari</i>, <i>Clivia miniata</i>, <i>Agapanthus</i> spp. and Geraniums. Most of the plants within this zone were less than 2m tall.</p>	
Justification of Vegetation Assignment	<p>The vegetation within this area was clearly planted in garden beds for aesthetic reasons. As the vegetation could not be assigned to a locally occurring native community it has been classified as Exotic/Native Landscaping.</p>
BC Act 2016 Status	N/A
EPBC Act 1999 Status	N/A
References	N/A



Figure 4. Narla field-validated vegetation communities within the Subject Site.

5. Threatened Species

5.1 Threatened Flora

Desktop analysis revealed a range of threatened flora as occurring or having the potential to occur on or within a 10km x 10km cell centred on the Subject Site. Targeted surveys were undertaken throughout the Subject Site for potentially occurring threatened flora (Figure 5). No threatened flora were identified at the time of the site assessment.

Owing to the degraded nature of the Subject Site it was deemed unlikely that these species are present and therefore, that the proposed activity will have a significant impact. As a result, no further assessment of impacts pursuant to the BC Act (e.g. Biodiversity Development Assessment Report [BDAR]) and/or EPBC Act Referral to Commonwealth will be required. A comprehensive list of flora species identified within, and immediately surrounding, the Subject Site during the site assessment is presented in Appendix B.

The following locally occurring species were assessed for their potential to occur within the Subject Site (Table 6).

Table 6. Assessment of likely occurrence of threatened flora species within the Subject Site

Species	BC Act	EPBC Act	Likelihood of occurrence within the Subject Site	Further Impact Assessment Required?
<i>Acacia bynoeana</i> (Bynoe's Wattle)	E	V	Absent. Occurs in 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. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No
<i>Acacia clunies-rossiae</i> (Kanangra Wattle)	V	-	Absent. Grows in dry sclerophyll forest on skeletal soils on rocky slopes, or on alluvium along creeks. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No
<i>Acacia pubescens</i> (Downy Wattle)	V	V	Absent. Occurs on alluviums, shales and at the intergrade between shales and sandstones. 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. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No

Species	BC Act	EPBC Act	Likelihood of occurrence within the Subject Site	Further Impact Assessment Required?
<i>Acacia terminalis</i> subsp. <i>Eastern Sydney</i> (Sunshine wattle)	E	V	Low. Coastal scrub and dry sclerophyll woodland on sandy soils. Most sites are highly modified or disturbed due to surrounding urban development. The Subject Site does not have habitat that is suitable for this species.	No
<i>Callistemon linearifolius</i> (Netted Bottle Brush)	V	-	Very low. This species grows in dry sclerophyll forests on the coast and adjacent ranges. The Subject Site is heavily degraded with habitat that is unsuitable for this species.	No
<i>Darwinia biflora</i>	V	V	Absent. Occurs on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone. Associated overstorey species include <i>Eucalyptus haemastoma</i> , <i>Corymbia gummifera</i> and/or <i>E. squamosa</i> . The vegetation structure is usually woodland, open forest or scrub-heath. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No
<i>Deyeuxia appressa</i>	E	E	Absent. Species presumed extinct.	No
<i>Dillwynia tenuifolia</i>	V	-	Absent. This species typically grows in scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No
<i>Epacris purpurascens</i> var. <i>purpurascens</i>	V	-	Very low. Found in a range of habitat types, most of which have a strong shale soil influence. The Subject Site is heavily degraded with habitat that is unsuitable for this species.	No
<i>Eucalyptus camfieldii</i> (Camfield's Stringybark)	V	V	Absent. Poor coastal country in shallow sandy soils overlying Hawkesbury sandstone. Coastal heath mostly on exposed sandy ridges. Associated species frequently include stunted species of <i>E. oblonga</i> Narrow-leaved Stringybark, <i>E. capitellata</i> Brown Stringybark and <i>E. haemastoma</i> Scribbly Gum. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No

Species	BC Act	EPBC Act	Likelihood of occurrence within the Subject Site	Further Impact Assessment Required?
<i>Eucalyptus nicholii</i> (Narrow-leaved Black Peppermint)	V	V	Absent. Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No
<i>Genoplesium baueri</i> (Bauer's Midge Orchid)	E	E	Low. Grows in dry sclerophyll forest and moss gardens over sandstone. The Subject Site is heavily degraded with habitat that is unsuitable for this species.	No
<i>Grammitis stenophylla</i> (Narrow-leaf Finger Fern)	E	-	Absent. Moist places, usually near streams, on rocks or in trees, in rainforest and moist eucalypt forest. Although potential habitat occurred within the Subject Site, this species was not detected during the site assessment.	No
<i>Hibbertia spanantha</i> (Julian's Hibbertia)	CE	CE	Low. Grows in forest with canopy species including <i>Eucalyptus pilularis</i> , <i>E. resinifera</i> , <i>Corymbia gummifera</i> and <i>Angophora costata</i> . The understorey is open with species of Poaceae, Orchidaceae, Fabaceae and Liliaceae. Potential habitat occurred within the Subject Site but it was heavily degraded.	No
<i>Lasiopetalum joyceae</i>	V	V	Low. Grows in heath on sandstone. The Subject Site is heavily degraded with habitat that is unsuitable for this species.	No
<i>Leptospermum deanei</i>	V	V	Low. Woodland on lower hill slopes or near creeks. Sandy alluvial soil or sand over sandstone. Occurs in Riparian Scrub - e.g. <i>Tristaniopsis laurina</i> , <i>Baechea myrtifolia</i> ; Woodland - e.g. <i>Eucalyptus haemstoma</i> ; and Open Forest - e.g. <i>Angophora costata</i> , <i>Leptospermum trinervium</i> , <i>Banksia ericifolia</i> . Although potential habitat occurred within the Subject Site it was heavily degraded.	No
<i>Macadamia integrifolia</i> (Macadamia Nut)	-	V	Absent. This species is not known to occur naturally in the wild in NSW. This species was not detected during the site assessment.	No

Species	BC Act	EPBC Act	Likelihood of occurrence within the Subject Site	Further Impact Assessment Required?
<i>Macadamia tetraphylla</i> (Rough-shelled Bush Nut)	V	V	Absent. Confined chiefly to the north of the Richmond River in north-east NSW, extending just across the border into Queensland. Many records, particularly those further south, are thought to be propagated. This species was not detected during the site assessment.	No
<i>Melaleuca deanei</i> (Deane's Paperbark)	E	E	Absent. The species occurs mostly in ridgetop woodland, with only 5% of sites in heath on sandstone. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No
<i>Persoonia hirsuta</i> (Hairy Geebung)	E	E	Absent. The Hairy Geebung is found in clayey and sandy soils in dry sclerophyll open forest, woodland and heath, primarily on the Mittagong Formation and on the upper Hawkesbury Sandstone. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No
<i>Pimelea curviflora</i> var. <i>curviflora</i>			Low. Occurs on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. The Subject Site is heavily degraded with habitat that is unsuitable for this species.	No
<i>Prostanthera marifolia</i> (Seaforth Mintbush)	CE	CE	Absent. Occurs in localised patches in or in close proximity to the endangered Duffys Forest ecological community. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No
<i>Rhodamnia rubescens</i> (Scrub Turpentine)	CE	CE	Absent. This species is known to occur in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. The Subject Site is heavily degraded such that this species is very unlikely to occur. Moreover, it was not detected during the site assessment.	No
<i>Syzygium paniculatum</i> (Magenta Lilly Pilly)	E	V	Low. This species is restricted mainly to remnant stands of Littoral Rainforest. No such habitat occurs within the Subject Site.	No

Species	BC Act	EPBC Act	Likelihood of occurrence within the Subject Site	Further Impact Assessment Required?
<i>Tetradthea glandulosa</i>	V	-	Absent. This species typically inhabits ridgetops, upper slopes and to a lesser extent mid slopes sandstone benches in vegetation associated with shale-sandstone transition habitat where shale-cappings occur over sandstone, with associated soil landscapes such as Lucas Heights, Gynea, Lambert and Faulconbridge. The Subject Site is heavily degraded with habitat that is unsuitable for this species. This species was not detected during the site assessment.	No
<i>Wilsonia backhousei</i> (Narrow-leaved Wilsonia)	V	-	Absent. This is a species of the margins of salt marshes and lakes. No such habitat occurs within the Subject Site. This species was not detected during the site assessment.	No
<i>Zannichellia palustris</i>	E	-	Low. Grows in fresh or slightly saline stationary or slowly flowing water. No Such habitat occurs within the Subject Site.	No

V – Vulnerable; E – Endangered; CE – Critically Endangered



Figure 5. Targeted survey effort for threatened species within the Subject Site and immediate surrounds.

5.2 Threatened Fauna

Details of the threatened fauna habitat recorded within the Subject Site are included in **Table 7**. The likelihood of occurrence of threatened fauna species within the Subject Site is presented in **Table 8**.

A small suite of avian native fauna species were identified within and surrounding the Subject Site during the site assessment. All native fauna species encountered are listed as 'protected' under the BC Act. The list of fauna recorded during the site visit was produced opportunistically (**Appendix C**).

Based on unsuitable habitat, geographic distribution and/or the small scale of the proposed activity, it was determined that the proposed works are unlikely to significantly impact upon any potentially occurring BC Act or EPBC Act listed threatened species.

Table 7. Fauna habitat values identified within the Subject Site

Habitat component	Subject Site
Coarse woody debris	Absent.
Rock outcrops and bush rock	Some scattered bush rock was present.
Caves, crevices and overhangs	Absent.
Culverts, bridges, mine shafts, or abandoned structures	Absent.
Nectar/lerp-bearing Trees	<i>Lophostemon confertus</i> and eucalypts were recorded within the Subject Site. These trees may provide intermittent nectar sources for nectivores such as the Grey-headed Flying-fox.
Nectar-bearing shrubs	<i>Banksia</i> spp., <i>Grevillea</i> spp. and <i>Callistemon</i> spp. were identified within the Subject Site and may provide intermittent nectar sources for nectivores.
Koala Use Trees	Numerous koala use trees (eucalypts) were present throughout the Subject Site.
Large stick nests	Absent.
Sap and gum sources	Native sap and gum source trees were recorded within the Subject Site such as <i>Eucalyptus</i> spp. These trees may provide intermittent sap and/or lerp sources for various fauna species.
She-oak fruit (Glossy Black Cockatoo feed)	A small stand of <i>Casuarina glauca</i> was present in the Subject Site.
Seed-bearing trees and shrubs	Seed-bearing trees such as <i>Eucalyptus</i> spp. and <i>Lophostemon confertus</i> were identified within the Subject Site and may provide foraging habitat for Gang-gang Cockatoos.
Soft-fruit-bearing trees/shrubs	Soft-fruit-bearing trees such as <i>Pittosporum undulatum</i> occur throughout the Subject Site. These trees may provide intermittent fruit sources for fructivores such as the Grey-headed Flying-fox.
Dense shrubbery and leaf litter	Present in planted garden beds.
Tree hollows	One tree hollow was present but was occupied by honey bees.
Decorticating bark	Present.
Wetlands, soaks, and streams	Absent.
Open water bodies	Absent.

Habitat component	Subject Site
Estuarine, beach, mudflats, and rocky foreshores	Absent.

5.3 Migratory Fauna Species

The following EPBC Act listed migratory fauna species were considered to occasionally use habitat within or around the Subject Site for foraging or passage:

- *Cuculus optatus* (Oriental Cuckoo);
- *Hirundapus caudacutus* (White-throated Needletail);
- *Monarcha melanopsis* (Black-faced Monarch);
- *Monarcha trivirgatus* (Spectacled Monarch);
- *Motacilla flava* (Yellow Wagtail);
- *Myiagra cyanoleuca* (Satin Flycatcher); and
- *Rhipidura rufifrons* (Rufous Fantail).

The proposed activity will have low impacts to potential foraging habitat and negligible impacts to potential breeding habitat for these species given their migratory nature. In the unlikely event that these species forage within the Subject Site, the proposed removal of vegetation will have low impacts to foraging habitat given the large areas of suitable foraging habitat in the surrounding area and in their migratory range. No anticipated net loss of breeding habitat is expected as these species do not breed within or in close proximity of the Subject Site. As such, the proposed activity is unlikely to a significant impact on these species; therefore, a Referral to Commonwealth pursuant to the EPBC Act should not be required.

Table 8. Assessment of likely occurrence of threatened fauna species within the Subject Site

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Anthochaera phrygia</i> (Regent Honeyeater)	CE	CE	Low	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Potential foraging habitat is present within the Subject Site.	There are three known key breeding areas, two of them in NSW - Capertee Valley and Bundarra-Barraba regions. The Subject Site is not within these regions.	Low anticipated impact to potential foraging habitat given the removal of one tree. No anticipated impact to breeding habitat. Furthermore, the Subject Site is not mapped on the important areas map for the species (DPE 2022f). The site assessment in August 2022 did not detect this species.	No
<i>Artamus cyanopterus cyanopterus</i> (Dusky Woodswallow)	V	-	Low	This species often inhabits dry, open eucalypt forests and woodlands with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. Suboptimal foraging habitat occurs within the Subject Site given the lack of woody debris, saplings and the level of disturbance.	This species nests in dry open Eucalypt Forest. No nests were identified within the Subject Site.	Low anticipated impact to suboptimal foraging habitat given the removal of one tree. No anticipated impact to breeding habitat. The site assessment in August 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Botaurus poiciloptilus</i> (Australasian Bittern)	E	E	Very Low	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (<i>Typha spp.</i>) and spikerushes (<i>Eleocharis spp.</i>). No such habitat occurs within the Subject Site.	Breeding occurs in summer from October to January; nests are built in secluded places in densely-vegetated wetlands on a platform of reeds. No such habitat occurs within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Calidris alba</i> (Sanderling)	V	-	Very Low	Often found in coastal areas on low beaches of firm sand, near reefs and inlets, along tidal mudflats and bare open coastal lagoons; individuals are rarely recorded in near-coastal wetlands. Individuals run behind receding waves, darting after insects, larvae and other small invertebrates in the sand, then dart back up the beach as each wave breaks. No such habitat occurs within the Subject Site.	Breeding occurs in the Northern Hemisphere.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Calidris canutus</i> (Red Knot)	-	E	Very Low	In NSW the Red Knot mainly occurs in small numbers on intertidal mudflats, estuaries, bays, inlets, lagoons, harbours and sandflats and sandy beaches of sheltered coasts. It is occasionally found on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms and is a rare visitor to terrestrial saline wetlands and freshwater swamps. No such habitat occurs within the Subject Site.	This species does not breed in Australia.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Calidris ferruginea</i> (Curlew Sandpiper)	E	CE	Very Low	It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. No such habitat occurs within the Subject Site.	This species does not breed in Australia.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Calidris tenuirostris</i> (Great Knot)	V	CE	Very Low	Occurs within sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons. No such habitat occurs within the Subject Site.	This species does not breed in Australia.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Callocephalon fimbriatum</i> (Gang-gang Cockatoo)	V	E	Low	In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. No such habitat occurs within the Subject Site.	Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger in eucalypts. No such habitat occurs within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Calyptorhynchus lathamii</i> (Glossy Black Cockatoo)	V	-	Low	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (<i>Allocasuarina littoralis</i>) and Forest Sheoak (<i>A. torulosa</i>) are important foods. The Subject Site contains suboptimal foraging vegetation considering the level of urban disturbance and that the preferred feed trees were not present, however <i>Casuarina glauca</i> may provide foraging habitat for this species.	Dependent on large hollow-bearing eucalypts for nest sites. No hollows were identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat (no Casuarinas being removed). The site assessment in August 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Cercartetus nanus</i> (Eastern Pygmy-possum)	V	-	Low	<p>Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. They may occupy small patches of vegetation in fragmented landscapes and although the species prefers habitat with a rich shrub understory, they are known to occur in grassy woodlands and the presence of Eucalypts alone is sufficient to support populations in low densities. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; an important pollinator of heathland plants such as banksias; soft fruits are eaten when flowers are unavailable. Potential habitat occurs within the Subject Site.</p>	<p>Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum (<i>Pseudocheirus peregrinus</i>) dreys or thickets of vegetation, (e.g. grass-tree skirts); nest-building appears to be restricted to breeding females; tree hollows are favoured but spherical nests have been found under the bark of eucalypts and in shredded bark in tree forks. Potential breeding habitat occurs within the Subject Site.</p>	<p>Low anticipated impact to foraging and breeding habitat given the removal of one tree. The site assessment in August 2022 did not detect this species.</p>	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat)	V	V	Low	Found in well-timbered areas containing gullies. No such habitat occurs within the Subject Site.	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (<i>Petrochelidon ariel</i>), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years. No such habitat occurs within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Charadrius leschenaultia</i> (Greater Sand Plover)	V	V	Very Low	Almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks. No such habitat occurs within the Subject Site.	Roosts during high tide on sandy beaches and rocky shores; begin foraging activity on wet ground at low tide, usually away from the edge of the water; individuals may forage and roost with other waders. No such habitat occurs within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Circus assimilis</i> (Spotted Harrier)	V	-	Very Low	Occurs in grassy open woodland including Acacia 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. No such habitat occurs within the Subject Site.	Builds a stick nest in a tree and lays eggs in spring (or sometimes autumn), with young remaining in the nest for several months. No large stick nests were identified within the Subject Site at the time of the site assessment.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

Species	BC Act	EPBC Act	Likelihood of Occurrence	Foraging Habitat Present Within the Subject Site	Breeding Habitat Present Within the Subject Site	Anticipated Impact	Further Impact Assessment Required?
<i>Climacteris picumnus victoriae</i> (Brown Treecreeper (eastern subspecies))	V	-	Very Low	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (<i>Eucalyptus camaldulensis</i>) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. No such habitat occurs within the Subject Site.	Hollows in standing dead or live trees and tree stumps are essential for nesting. No such habitat occurs within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Daphoenositta chrysoptera</i> (Varied Sittella)	V	-	Low	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. No such habitat occurs within the Subject Site.	Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years. No such habitat occurs within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Dasyurus maculatus</i> (Spotted-tailed Quoll)	V	E	Very Low	A generalist predator with a preference for medium-sized (500g-5kg) mammals. Consumes a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits, reptiles and insects. Also eats carrion and takes domestic fowl. No such habitat occurs within the Subject Site.	This species uses hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. No such habitat was identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Ephippiorhynchus asiaticus</i> (Black-necked Stork)	E	-	Very Low	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries. Storks usually forage in water 5-30cm deep for vertebrate and invertebrate prey. Eels regularly contribute the greatest biomass to their diet, but they feed on a wide variety of animals, including other fish, frogs and invertebrates (such as beetles, grasshoppers, crickets and crayfish). No such habitat was identified within the Subject Site.	Black-necked Storks build large nests high in tall trees close to water. Trees usually provide clear observation of the surroundings and are at low elevation (reflecting the floodplain habitat). No such habitat was identified within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Epthianura albifrons</i> (White-fronted Chat) White-fronted Chat population in the Sydney Metropolitan Catchment Management Area	EP; V	-	Very Low	Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground. No wetland areas occur within the Subject Site.	Have been observed breeding from late July through to early August, with 'open-cup' nests built in low vegetation. Nests in the Sydney region have also been seen in low isolated mangroves. Nests are usually built about 23 cm above the ground (but have been found up to 2.5 m above the ground). No nests were identified within the Subject Site at the time of the site assessment.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Falco subniger</i> (Black Falcon)	V	-	Very Low	The Black Falcon inhabits woodland, shrubland and grassland in the arid and semi-arid zones, especially wooded (eucalypt- dominated) watercourses; it also uses agricultural land with scattered remnant trees. The Falcon is often associated with streams or wetlands, visiting them in search of prey. No such habitat was identified within the Subject Site.	Nest along tree-lined creeks and rivers of inland drainage systems. Eggs are laid in the abandoned stick nests of other birds, usually high in a tree. No stick nests were identified within the Subject Site at the time of the site assessment.	Low anticipated impact to suboptimal potential foraging habitat as it is located in a highly fragmented and urbanised area surrounded by busy urban streets. No anticipated net loss of breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle)	V	-	Low	This species prefers moist habitats with trees taller than 20m. Feeds on insects. Potential prey items may occur within the Subject Site, however foraging habitat is suboptimal given the Subject Site is heavily degraded.	Generally, roosts in Eucalypt hollows, but has also been found under loose bark on trees or in buildings nearby foraging habitat. Several buildings were present within the Subject Site.	Low anticipated impact to potential foraging habitat given the removal of one tree void of hollows or loose bark. No impact to breeding habitat given no buildings are being removed.	No
<i>Glossopsitta pusilla</i> (Little Lorikeet)	V	-	Low	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Potential foraging habitat occurs within the Subject Site.	This species favours small hollows in Eucalypts. No hollows were identified within the Subject Site.	Low anticipated impact to potential foraging habitat given the removal of one tree. No anticipated impact to breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Haematopus longirostris</i> (Pied Oystercatcher)	E	-	Very Low	Favours intertidal flats of inlets and bays, open beaches and sandbanks. Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish. The chisel-like bill is used to pry open or break into shells of oysters and other shellfish. No such habitat occurs within the Subject Site.	Nests mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas. Nests are shallow scrapes in sand above the high tide mark, often amongst seaweed, shells and small stones. No such habitat occurs within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)	V	-	Low	Foraging habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. No such is present within the Subject Site.	Breeding habitat is live large old trees within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines. No nests were identified within the Subject Site at the time of the site assessment.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Hieraaetus morphnoides</i> (Little Eagle)	V	-	Low	Occupies open eucalypt forest, woodland or open woodland. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion. Potential prey items may occur within the Subject Site however foraging habitat is suboptimal given the Subject Site is located in a suburban school.	This species nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. No stick nests were identified within the Subject Site at the time of the site assessment.	Low anticipated impact to suboptimal foraging habitat given the removal of one tree. No anticipated impact to breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Hirundapus caudacutus</i> (White-throated Needle-tail)	-	V	Low	This species has been recorded eating a wide variety of insects, including beetles, cicadas, flying ants, bees, wasps, flies, termites, moths, locusts and grasshoppers. Prey items may be present within the Subject Site.	N/A. This species does not breed in Australia.	Low anticipated impact to potential foraging habitat given the removal of one tree. No anticipated impact to breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Ixobrychus flavicollis</i> (Black Bittern)	V	-	Very Low	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. No such habitat is present within the Subject Site.	During the day, roosts in trees or on the ground amongst dense reeds. No such habitat occurs within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Lathamus discolor</i> (Swift Parrot)	E	CE	Low	Although potential feed trees occur on the Subject Site which may attract this species if they are flowering profusely or if lerp is abundant, this is considered suboptimal foraging habitat as it is located in a highly modified environment (suburban school).	N/A. The Swift Parrot only breeds in Tasmania.	Low anticipated impact to potential foraging habitat given the removal of one tree. No anticipated impact to breeding habitat. The Subject Site is not mapped on the important areas mapped for the species. The site assessment in August 2022 did not detect this species.	No
<i>Limicola falcinellus</i> (Broad-billed Sandpiper)	V	-	Very Low	Broad-billed Sandpipers favour sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs as feeding and roosting habitat. No such habitat occurs within the Subject Site.	Broad-billed Sandpipers favour sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs as feeding and roosting habitat. No such habitat occurs within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Limosa limosa</i> (Black-tailed Godwit)	V	-	Very Low	Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. No such habitat occurs within the Subject Site.	Roosts and loafs on low banks of mud, sand and shell bars. No such habitat occurs within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Litoria aurea</i> (Green and Golden Bell Frog)	E	V	Very Low	This species inhabits marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spikerushes (<i>Eleocharis</i> spp.). No such habitat was present within the Subject Site.	This species breeds in marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spikerushes (<i>Eleocharis</i> spp.). No such habitat was present within the Subject Site.	Negligible. No anticipated impact to foraging or breeding habitat.	No
<i>Micronomus norfolkensis</i> (Eastern Coastal Free-tailed Bat)	V	-	Low	Occur in dry sclerophyll forest, swamp forests and mangrove forests east of the Great Dividing Range, feeding on insects. Potential prey items may occur within the Subject Site.	Roost mainly in tree hollows but will also roost under bark or in man-made structures. Manmade structures (buildings) were present within the Subject Site.	Low anticipated impact to potential foraging and breeding habitat given the removal of one tree without hollows or loose bark.	No
<i>Miniopterus australis</i> (Little Bent-winged Bat)	V	-	Low	This species forage for small insects beneath the canopy of densely vegetated habitats. No such habitat occurs within the Subject Site.	Only five nursery sites/maternity colonies are known in Australia. The Subject Site is not located near a known maternity colony; therefore, it is not expected breeding habitat will be impacted.	Negligible, no anticipated net loss of foraging or breeding habitat.	No

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<i>Miniopterus oriana oceanensis</i> (Large Bent-winged Bat)	V	-	Low	Hunt in forested areas, catching moths and other flying insects above the tree tops. No such habitat occurs within the Subject Site.	This species only breeds in caves. No such habitat was identified within, or in close proximity to, the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat.	No
<i>Myotis macropus</i> (Southern Myotis)	V	-	Low	This species forages over streams and pools catching insects and small fish by raking their feet across the water surface. No such habitat was present within the Subject Site.	Generally, roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Several buildings were present within the Subject Site.	Negligible anticipated impact to potential foraging and breeding habitat given the removal of one tree without hollows.	No
<i>Neophema pulchella</i> (Turquoise Parrot)	V	-	Low	Prefers to feed in the shade of a tree and spends most of the day on the ground searching for the seeds or grasses and herbaceous plants, or browsing on vegetable matter. Potential foraging habitat was identified within the Subject Site.	Nests in tree hollows, logs or posts. No such habitat was observed within the Subject Site at the time of the site assessment.	Low anticipated impact to potential foraging habitat given the removal of one tree. No anticipated impact to breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Nettapus coromandelianus</i> (Cotton Pygmy-Goose)	E	-	Very Low	Freshwater lakes, lagoons, swamps and dams, particularly those vegetated with waterlilies and other floating and submerged aquatic vegetation. No such habitat was present within the Subject Site.	The Cotton Pygmy-goose uses tall standing dead trees with hollows located close to water for roosting and breeding. No such habitat was present within the Subject Site.	Negligible, no anticipated net loss of foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	Low
<i>Ninox connivens</i> (Barking Owl)	V	-	Low	Preferentially hunts small arboreal mammals such as Squirrel Gliders and Common Ringtail Possums, but when loss of tree hollows decreases these prey populations the owl becomes more reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Potential prey items may occur within the Subject Site. This is considered suboptimal foraging habitat as it is located in a highly modified environment (suburban school).	Breeding occurs in hollows of large, old trees. Living eucalypts are preferred though dead trees are also used. No such habitat was observed within the Subject Site.	Low anticipated impact to suboptimal foraging habitat given the removal of one tree. No anticipated impact to breeding habitat.	No

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<i>Ninox strenua</i> (Powerful Owl)	V	-	Low	Main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. Potential prey items may occur within the Subject Site. This is considered suboptimal foraging habitat as it is located in a highly modified environment (suburban school).	This species 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. No such habitat was observed within the Subject Site.	Low anticipated impact to suboptimal foraging habitat given the removal of one tree. No anticipated impact to breeding habitat.	No
<i>Numenius madagascariensis</i> (Eastern Curlew)	-	CE	Very Low	This species generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts. No such habitat occurs within the Subject Site.	This species does not breed in Australia	Negligible. No anticipated impact to foraging or breeding habitat. Site assessment in August 2022 did not detect this species.	No
<i>Pandion cristatus</i> (Eastern Osprey)	V	-	Very Low	This species favours coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. No such habitat occurs within the Subject Site.	Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea. No nests were identified within the Subject Site at the time of the site assessment.	Negligible. No anticipated impact to foraging or breeding habitat. Site assessment in August 2022 did not detect this species.	No

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<i>Perameles nasuta</i> (Long-nosed Bandicoot population in inner western Sydney)	EP	-	Low	Forage in parkland and backyards. Potential foraging habitat was present within the Subject Site.	Breeds in proximity to foraging habitat. Shelters mostly under older houses and buildings. Potential breeding habitat was present within the Subject Site.	Low anticipated impact to suboptimal foraging and breeding habitat given the removal of one tree.	No
<i>Petauroides volans</i> (Greater Glider)	-	V	Very Low	This species is typically found in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. Such habitat does not occur within the Subject Site.	This species is typically found in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. Such habitat does not occur within the Subject Site.	Negligible. No anticipated impact to foraging or breeding habitat.	No
<i>Petaurus australis</i> (Yellow-bellied Glider)	V	V	Low	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Such habitat does not occur within the Subject Site.	Den, often in family groups, in hollows of large trees. Such habitat does not occur within the Subject Site.	Negligible. No anticipated impact to foraging or breeding habitat.	No

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<i>Petroica boodang</i> (Scarlet Robin)	V	-	Low	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat. No such habitat occurs within the Subject Site.	The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal region. The Subject Site is not located a ridge, hill or foot slopes.	Negligible. No anticipated impact to foraging or breeding habitat. Site assessment in August 2022 did not detect this species.	No
<i>Phascolarctos cinereus</i> (Koala)	V	V	Very Low	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. Potential foraging habitat was identified within the Subject Site, however this is considered suboptimal given the highly fragmented and urbanised nature of the site.	Potential breeding habitat was identified within the Subject Site, however this is considered suboptimal given the highly fragmented and urbanised nature of the site.	Low anticipated impact to suboptimal foraging and breeding habitat. The Subject Site is highly urbanised and contains fragmented vegetation surrounded by busy urban streets and industrial development.	No
<i>Pommerhelix duralensis</i> (Dural Land Snail)	E	E	Very Low	The species has a strong affinity for communities in the interface region between shale-derived and sandstone-derived soils, with forested habitats that have good native cover and woody debris. No dense leaf litter, leaves, logs or other sheltering habitat was present within the Subject Site.	The species has also been observed resting in exposed areas, such as on exposed rock or leaf litter, however it will also shelter beneath leaves, rocks and light woody debris. The Subject Site does not contain leaf litter or light woody debris.	Negligible. No anticipated impact to foraging or breeding habitat.	No

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<i>Pseudomys gracilicaudatus</i> (Eastern Chestnut Mouse)	V	-	Very Low	In NSW the Eastern Chestnut Mouse is mostly found, in low numbers, in heathland and is most common in dense, wet heath and swamps. In the tropics it is more an animal of grassy woodlands. No such habitat occurs within the Subject Site.	Breeding habitat is the same as foraging habitat. No such habitat occurs within the Subject Site.	Negligible. No anticipated impact to foraging or breeding habitat.	No
<i>Pseudophryne australis</i> (Red-crowned Toadlet)	V	-	Low	Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Shelters under rocks and amongst masses of dense vegetation or thick piles of leaf litter. No such habitat occurs within the Subject Site.	Breeding congregations occur in dense vegetation and debris beside ephemeral creeks and gutters. Red-crowned Toadlets have not been recorded breeding in waters that are even mildly polluted or with a pH outside the range 5.5 to 6.5. No such habitat occurs within the Subject Site.	Negligible. No anticipated impact to foraging or breeding habitat.	No
<i>Pteropus poliocephalus</i> (Grey-headed Flying-fox)	V	V	Low	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines. Potential foraging habitat was identified with the Subject Site.	No breeding camps were identified within or surrounding the Subject Site.	Low anticipated impact to potential foraging habitat given the removal of one tree. No anticipated impact to breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Ptilinopus regina</i> (Rose-crowned Fruit-Dove)	V	-	Low	Rose-crowned Fruit-doves occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful. They feed entirely on fruit from vines, shrubs, large trees and palms, and are thought to be locally nomadic as they follow the ripening of fruits. Potential foraging habitat was identified with the Subject Site.	Rose-crowned Fruit-Doves breed in rainforests with a dense growth of vines. No such habitat occurs within the Subject Site.	Low anticipated impact to potential foraging habitat given the removal of one tree. No anticipated impact to breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Ptilinopus superbus</i> (Superb Fruit-Dove)	V	-	Low	Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees. Potential foraging habitat was identified with the Subject Site.	The nest is a structure of fine interlocked forked twigs, giving a stronger structure than its flimsy appearance would suggest, and is usually 5-30 metres up in rainforest and rainforest edge tree and shrub species. No such habitat occurs within the Subject Site.	Low anticipated impact to potential foraging habitat given the removal of one tree. No anticipated impact to breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Rostratula australis</i> (Australian Painted Snipe)	E	E	Very Low	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. No such habitat occurs within the Subject Site.	The nest consists of a scrape in the ground, lined with grasses and leaves. No nests were identified within the Subject Site at the time of the site assessment.	Negligible. No anticipated impact to foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Saccolaimus flaviventris</i> (Yellow-bellied Sheathtail-bat)	V	-	Low	This species feeds on insects, flying high and fast over the forest canopy. Prey items may be present within the Subject Site.	Roosts singly or in groups of up to six, in tree hollows and buildings. No tree hollows occur within the Subject Site. Several buildings occurs within the Subject Site.	Low anticipated impact to potential foraging and breeding habitat given the removal of one tree and no buildings.	No
<i>Scoteanax rueppellii</i> (Greater Broad-nosed Bat)	V	-	Low	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. Prey items may be present within the Subject Site.	Although this species usually roosts in tree hollows, it has also been found in buildings. No tree hollows occur within the Subject Site. Several buildings occurs within the Subject Site.	Low anticipated impact to potential foraging and breeding habitat given the removal of one tree and no buildings.	No
<i>Sternula albifrons</i> (Little Tern)	E	-	Very Low	Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records). No harbours, inlets and rivers occur within the Subject Site.	Nests in small, scattered colonies in low dunes or on sandy beaches just above high tide mark near estuary mouths or adjacent to coastal lakes and islands. No such habitat occurs within the Subject Site. No nests were identified within the Subject Site at the time of the site assessment.	Negligible. No anticipated impact to foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Stictonetta naevosa</i> (Freckled Duck)	V	-	Very Low	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. No such habitat occurs within the Subject Site.	Nests are usually located in dense vegetation at or near water level. No such habitat occurs within the Subject Site. No nests were identified within the Subject Site at the time of the site assessment.	Negligible. No anticipated impact to foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

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<i>Tyto longimembris</i> (Eastern Grass Owl)	V	-	Very Low	Eastern Grass Owls are found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains. No such habitat occurs within the Subject Site.	Always breeds on the ground. Nests are found in trodden grass, and often accessed by tunnels through vegetation. No nests were identified within the Subject Site at the time of the site assessment.	Negligible. No anticipated impact to foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Tyto novaehollandiae</i> (Masked Owl)	V	-	Very Low	The Masked Owl inhabits forests, woodlands, timbered waterways and open country on the fringe of these areas. The main requirements are tall trees with suitable hollows for nesting and roosting and adjacent areas for foraging. Suboptimal foraging habitat is present within the Subject Site given the lack of tall trees with suitable hollows. Prey items may be present within the Subject Site.	Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. No hollows were identified within the Subject Site.	Low anticipated impact to potential foraging habitat given the removal of one tree. No anticipated loss of breeding habitat. The site assessment in August 2022 did not detect this species.	No
<i>Xenus cinereus</i> (Terek Sandpiper)	V	-	Very Low	In Australia, has been recorded on coastal mudflats, lagoons, creeks and estuaries. No such habitat is present within the Subject Site.	Generally roosts communally amongst mangroves or dead trees, often with related wader species. No such habitat is present within the Subject Site.	Negligible. No anticipated impact to foraging or breeding habitat. The site assessment in August 2022 did not detect this species.	No

V – Vulnerable; E – Endangered; EP – Endangered Population; CE – Critically Endangered

6. Impact Summary

6.1 Vegetation Loss

The proposed activity will result in the following impacts to the vegetation within the Subject Site (**Figure 6**):

- The removal of approximately 0.01ha of vegetation identified as PCT 1841: Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region; and
- The removal of approximately 0.11ha of vegetation identified as Exotic Dominated Groundcover.

The proposed activity will require the removal of one tree for the construction of the building and the possible trimming of several other trees to comply with the APZ requirements.

6.1.1 Asset Protection Zone for Bushfire Protection

The bushfire assessment (Australian Bushfire Consulting Services, 2022) recommends that 'all grounds within the subject site and north of the existing cyclone wire fence are to be maintained as an Asset Protection Zone / Inner Protection Area (IPA) in accordance with Appendix 4 of PBP 2019 and the NSW RFS document Standards for Asset Protection Zones.'

To achieve this the vegetation within the Subject Site requires some minor maintenance only (e.g. trimming tree branches) and no wholesale tree removal.

6.2 TEC Impact


There will be no impacts to threatened ecological communities.



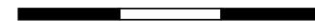
Impacts to Vegetation

-  Subject Site
-  Proposed Development

Vegetation to be Impacted

-  PCT 1841: Smooth-barked Apple- Turpentine- Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region
-  Exotic dominated groundcover

0 25 50 75 m



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Date: 12/09/2022
 Coordinate System: GDA94 MGA Zone 56
 Image Source: Nearmap Australia (Aug 2022)

Figure 6. Vegetation to be impacted by the proposed activity.

7. Recommendations

7.1 Impact Mitigation and Minimisation Recommendations

This section of the report details recommended efforts to avoid and minimise impacts on biodiversity values associated with the proposed activity. Measures to be implemented before, during, and post construction are detailed in **Table 9**.

Table 9. Measures to be implemented before, during, and after construction to avoid and minimise the impacts of the proposed activity.

Action	Outcome	Timing	Responsibility
Project Location, Design and Planning	The proposed activity is located partly within the existing footprint of an existing block of demountable buildings (recently removed). It has been designed to avoid impacting the native canopy trees along the northern boundary, with only two trees required to be removed to accommodate the new classroom building. The trees to be impacted were recommended for removal in the Arboriculture Impact Assessment (Redgum Horticultural, 2022) as they were showing signs of declining health.	Pre-construction phase	Proponent
Tree Protections	<p>Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970) outlines that a Tree Protection Zone (TPZ) is the principal means of protecting trees on construction sites. It is an area isolated from construction disturbance so that the tree remains viable. Ideally, works should be avoided within the TPZ.</p> <p>A Minor Encroachment is less than 10% of the TPZ and is outside the structural root zone (SRZ). A Minor Encroachment is considered acceptable by AS-4970 when it is compensated for elsewhere and contiguous within the TPZ.</p> <p>A Major Encroachment is greater than 10% of the TPZ or inside the SRZ. Major Encroachments generally require root investigations undertaken by non-destructive methods or the use of tree sensitive construction methods.</p> <p>Tree protection fencing should be installed prior to the commencement of works and should follow the recommendations outlined in the Arboricultural Impact Assessment Report (Redgum Horticulture 2022).</p>	Pre-construction phase	Proponent Arborist
Assigning a Project Ecologist	Prior to the implementation of the activity, the proponent should commission the services of a qualified and experienced Ecologist with a minimum tertiary degree in Science, Conservation, Biology, Ecology, Natural Resource Management, Environmental Science or Environmental Management. The Ecologist	Pre-construction phase	Proponent Project Ecologist

Action	Outcome	Timing	Responsibility
	<p>must be licensed with a current Department of Primary Industries Animal Research Authority permit and New South Wales Scientific License issued under the BC Act.</p> <p>The Ecologist will be commissioned to:</p> <ul style="list-style-type: none"> Undertake a pre-clearing survey which includes targeted searches for threatened fauna threatened flora and Priority Weeds, and delineating habitat-bearing trees and shrubs; and Supervise the clearance of any habitat trees or shrubs identified during the pre-clearing survey (native and exotic) in order to capture, treat and/or relocate any displaced fauna. 		
Landscaping	The proposed landscaping of the Subject Site should incorporate locally indigenous species representative of PCT 1841: Smooth-barked Apple - Turpentine - Blackbutt tall open forest on enriched sandstone slopes and gullies of the Sydney region.	Pre-construction phase	Proponent Arborist Project Ecologist
Erosion and Sedimentation	Appropriate erosion and sediment control should be erected and maintained at all times during construction in order to avoid the potential of incurring indirect impacts on biodiversity values. As a minimum, such measures should comply with the relevant industry guidelines such as 'the Blue Book' (Landcom 2004).	Construction phase	Proponent Construction Contractor
Storage and Stockpiling (Soil and Materials)	Allocate all storage, stockpile, and laydown sites away from any vegetation that is planned to be retained. Avoid importing any soil from outside the site in order to avoid the potential of incurring indirect impacts on biodiversity values as this can introduce weeds and pathogens to the site. If materials are required to be imported for landscaping works, they are to be sterilised according to industry standards prior to importation to site.	Construction phase	Construction Contractors

8. Conclusion

This assessment indicates that the relevant provisions of the *Environmental Planning and Assessment Act 1979*, *Biodiversity Conservation Act 2016*, the *Ryde Local Environmental Plan 2014*, and the *Ryde Development Control Plan 2014* have been satisfied. There will be no significant impact to any threatened entities as a result of the proposed activity, provided the appropriate recommendations in this report are followed.

9. References

Australian Standard 4970 (2009) Protection of Trees on Development Sites (AS-4970)

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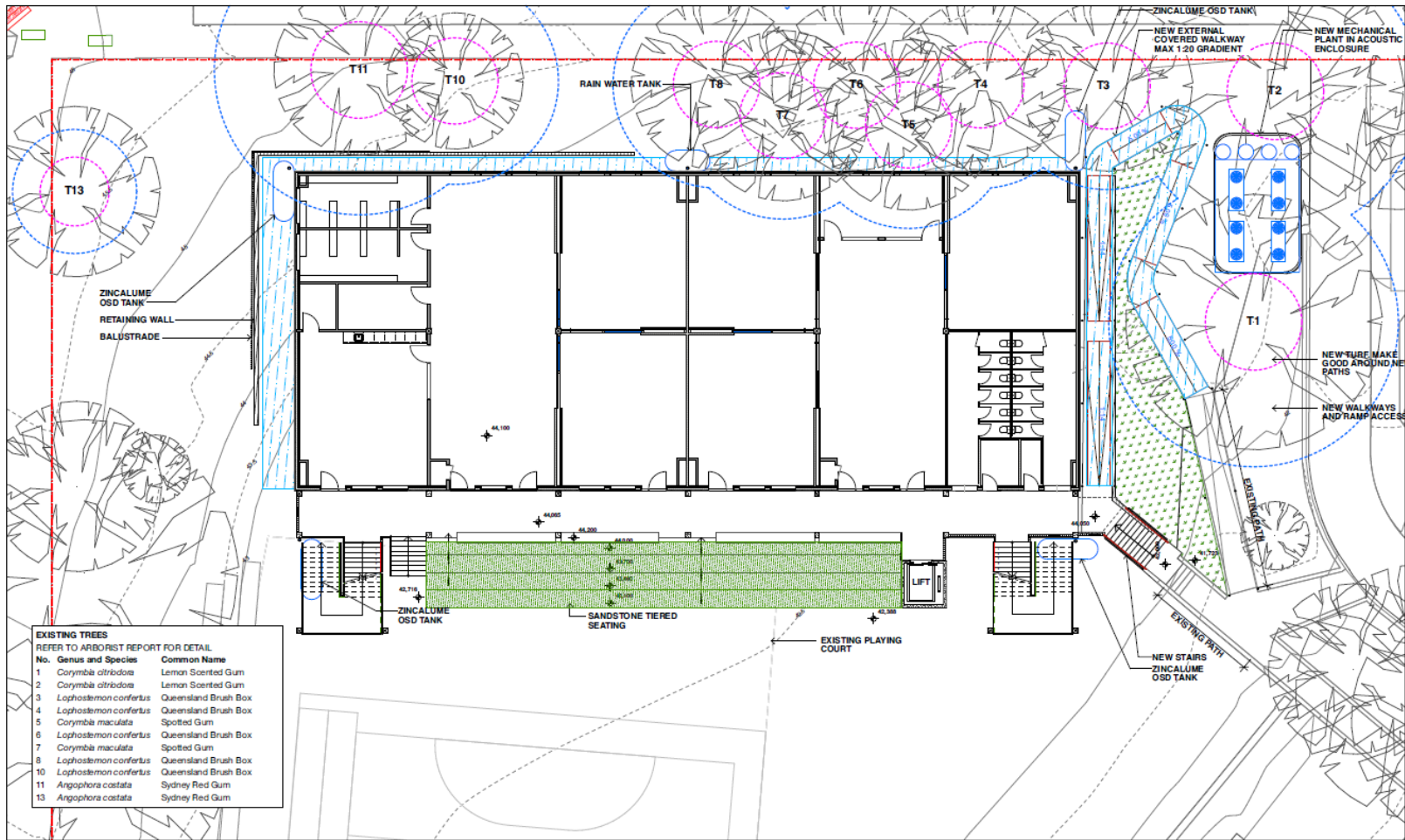
10. Appendices

Appendix A. Concept Site Plan (Bennett and Trimble, 2022).

Appendix B. Flora species identified within the Subject Site and immediate surrounds.

Appendix C. Fauna species identified within and surrounding the Subject Site.

Appendix A. Concept Site Plan (Bennett and Trimble, 2022).



EXISTING TREES
REFER TO ARBOREST REPORT FOR DETAIL

No.	Genus and Species	Common Name
1	<i>Corymbia albidodora</i>	Lemon Scented Gum
2	<i>Corymbia albidodora</i>	Lemon Scented Gum
3	<i>Lophostemon confertus</i>	Queensland Brush Box
4	<i>Lophostemon confertus</i>	Queensland Brush Box
5	<i>Corymbia maculata</i>	Spotted Gum
6	<i>Lophostemon confertus</i>	Queensland Brush Box
7	<i>Corymbia maculata</i>	Spotted Gum
8	<i>Lophostemon confertus</i>	Queensland Brush Box
10	<i>Lophostemon confertus</i>	Queensland Brush Box
11	<i>Angophora costata</i>	Sydney Red Gum
13	<i>Angophora costata</i>	Sydney Red Gum

1 LANDSCAPE PLAN 1:100

KEY

- Existing Tree
- Tree Protection Zone
- Retaining Wall
- Tree to be removed. Refer to Arbores report
- Turf
- Revegetation seed sowing
- New concrete paths, kerbing and curbs

NOTES

Client and Designer have no responsibility for existing or future works, including utility work, or other works, which may affect the proposed works. The Designer is not responsible for any such works. The Client is responsible for any such works. The Designer is not responsible for any such works. The Client is responsible for any such works.

ISSUE	NO.	FOR	DATE
REV	1	FOR REVIEW	25/03/2022
REV	2	FOR REVIEW	07/04/2022

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M Bennett No. 7025
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PROJECT NAME
RYDE SECONDARY COLLEGE

ADDRESS
5 Marvina Street
Ryde NSW 2112

PROJECT NUMBER
211021

STATUS
REF

DRAWING TITLE
GA - LANDSCAPE PLAN

DRAWING NUMBER
REF-A06

REVISION
01

SCALE
1:100 @ A1

DATE
7/9/2022

Appendix B. Flora species identified within the Subject Site and immediate surrounds.

Scientific Name	Canopy	Mid-Story	Ground
<i>Acacia</i> spp. (1)	x		
<i>Acacia</i> spp. (2)		x	
<i>Adiantum aethiopicum</i>			x
<i>Asparagus aethiopicus</i> **			x
<i>Asplenium australasicum</i>			x
<i>Banksia ericifolia</i>		x	
<i>Banksia serrata</i>	x		
<i>Banksia spinulosa</i>		x	
<i>Bidens pilosa</i> *			x
<i>Breynia oblongifolia</i>		x	
<i>Callistemon salignus</i>		x	
<i>Callistemon viminalis</i>		x	
<i>Camellia</i> spp.*		x	
<i>Cardamine</i> spp.*			x
<i>Casuarina glauca</i>	x		
<i>Cenchrus clandestinus</i> *			x
<i>Cerastium glomeratum</i> *			x
<i>Christella dentata</i>			x
<i>Clivia miniata</i> *			x
<i>Corymbia citriodora</i>	x		
<i>Corymbia maculata</i>	x		
<i>Cyathea</i> spp.		x	
<i>Cynodon dactylon</i>			x
<i>Dichondra repens</i>			x
<i>Elaeocarpus reticulatus</i>		x	
<i>Eucalyptus botryoides</i>	x		
<i>Eucalyptus resinifera</i>	x		
<i>Eucalyptus saligna</i>	x		
<i>Euphorbia prostrata</i> *			x
<i>Gardenia</i> spp.*		x	
<i>Geranium</i> spp.*			x
<i>Hakea sericea</i>		x	
<i>Ipomea indica</i> *			x
<i>Lex cornuta</i> *			*
<i>Lantana camara</i> **		x	
<i>Ligustrum lucidum</i> *	x		
<i>Ligustrum sinense</i> *		x	
<i>Liriope muscari</i> *			x
<i>Lomandra longifolia</i>			x
<i>Lophostemon confertus</i>	x		
<i>Melaleuca linariifolia</i>	x		
<i>Melaleuca styphelioides</i>	x		
<i>Modiola caroliniana</i> *			x
<i>Nephrolepis cordifolia</i> *			x

Scientific Name	Canopy	Mid-Story	Ground
<i>Oxalis</i> spp.			X
<i>Paspalum dilatatum</i> *			X
<i>Pinus</i> spp.*		X	
<i>Pittosporum undulatum</i>		X	
<i>Plantago lanceolata</i> *			X
<i>Poa annua</i> *			X
<i>Pteridium esculentum</i>			X
<i>Rhaphiolepis</i> spp.*		X	
<i>Rumex sagittatus</i> *			X
<i>Setaria parviflora</i> *			X
<i>Sida rhombifolia</i> *			X
<i>Sonchus oleraceus</i> *			X
<i>Solanum nigrum</i> *		X	
<i>Soliva sessilis</i> *			X
<i>Sporobolus creber</i>			X
<i>Syncarpia glomulifera</i>	X		
<i>Syzygium</i> spp.		X	
<i>Taraxacum officinale</i> *			X
<i>Tradescantia flumiensis</i> *			X
<i>Trifolium repens</i> *			X

* Denotes exotic species

** Denotes Priority Weed

Appendix C. Fauna species identified within and surrounding the Subject Site.

Class	Scientific Name	Common Name	Status
Aves	<i>Alectura lathamii</i>	Australian Brush-turkey	Protected
	<i>Cracticus tibicen</i>	Australian Magpie	
	<i>Cracticus torquatus</i>	Grey Butcherbird	
	<i>Manorina melanocephala</i>	Noisy Miner	
	<i>Threskiornis molucca</i>	Australian White Ibis	
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet	



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