ECOLOGICAL ASSESSMENT

For a
Proposed Educational Establishment
(All Saints College Maitland, St Peter's Campus)
Including adaptive reuse of the St Paul's Parish Hall, Multi-Purpose Centre, Signage and Staging
at

20-24 Hunter Street
HORSESHOE BEND
NSW

Prepared by: WILDTHING Environmental Consultants
38c Stapleton Street
WALLSEND NSW 2287
ABN: 41 033 509 215

For: **Catholic Diocese of Maitland-Newcastle**
C/ SHAC Architects
224 Maitland Road
ISLINGTON NSW 2296

Job No: 12655 ***March 2022***

38c Stapleton Street, Wallsend NSW 2287 Phone: 02 4951 3311 Fax: 02 4951 3399
Email: admin@wildthing.com.au www.wildthing.com.au
A division of Tattersall Lander Pty Ltd
ABN: 41 003 509 215

Project Name	Ecological Assessment for a proposed Educational Establishment (All Saints College Maitland, St Peter's Campus) including adaptive reuse of the St Paul's Parish Hall, Multi-Purpose Centre, Signage and Staging.	
Project Number	12655	
Prepared By	Dr Kylie Bridges Ecologist BEnvSc Hons PhD BAAS20005	
Reviewed By	Daryl Harman Senior Ecologist BEnvSc BAAS17074	
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Disclaimer

This report has been prepared in accordance with the proposal provided by the Client and outlined within this report. All findings, conclusions or recommendations contained within this report are based upon the data and results collected under the times and conditions specified in the report and are only applicable for the proposal considered within this report. This report has been prepared for use exclusively by the Client. No responsibility for its use by any other party is accepted by Wildthing Environmental Consultants.

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Acronyms and Abbreviations used in this report

AOBV	Area of outstanding Biodiversity Value
BAAS	Biodiversity Assessors Accreditation System
BAM	Biodiversity Assessment Method
BAMC	Biodiversity Assessment Method Calculator
BAR	Biodiversity Assessment Report
BC Act	Biodiversity Conservation Act 2016
BCAR	Biodiversity Certification Assessment Report
BCT	Biodiversity Conservation Trust
BDAR	Biodiversity Development Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOPC	Biodiversity Offsets Payment Calculator
BOS	Biodiversity Offset Scheme
BOSET	Biodiversity Offsets Scheme Entry Tool
BSA	Biodiversity Stewardship Site Agreement
BSSAR	Biodiversity Stewardship Site Assessment Report
DAWE	Department of Agriculture, Water and the Environment
EEC	Endangered Ecological Community
EPBC Act	Environmental Protection & Biodiversity Conservation Act 1999
EP&A Act	Environmental Planning & Assessment Act 1979
FM Act	Fisheries Management Act NSW 1994
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
LLS Act	Local Land Services Act 2013
NES	Matters of National Significance under the EPBC Act
NPW Act	National Parks & Wildlife Act 1974
OEH	Office of Environment & Heritage
PCT	Plant Community Type
PMST	Protected Matters Search Tool
SAII	Serious and Irreversible Impacts
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community

1.0 INTRODUCTION

Flora, fauna and habitat studies have been undertaken for a proposed Educational Establishment (All Saints College Maitland, St Peter's Campus) including adaptive reuse of the St Paul's Parish Hall, Multi-Purpose Centre, Signage and Staging at Lot 1 DP 69160, Lot 1 DP 1261532, Lot 1 DP 669283, Lot 2 DP 91268 (No. 20-24) Hunter Street, Horseshoe Bend NSW (the Subject Land). The investigations were in accordance with the requirements of the *Environmental Planning and Assessment Amendment Act 2017* (EP&A Act 2017), the *Biodiversity Conservation Act 2016* (BC Act 2016) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). The results are presented here in the form of an Ecological Assessment. A location map has been provided in Figure 1.1 and an aerial of the site has been provided in Figure 1.2.

1.1 SCOPE OF THE REPORT

The scope of this report is to assess the potential impacts that may occur as a result of the proposed development on threatened biodiversity listed under the BC Act and/or the EPBC Act.

These assessments have been prepared in accordance with:

- Section 7.3 of the BC Act (i.e. Assessment of Significance or Five-Part Test) specifically for listings under Schedule 1, 2 and 4; and
- Significant Impact Guidelines 1.1 - Matters of National Environmental Significance - specifically for listings under Section 18 and 18A of the EPBC Act (DoE 2013).

1.2 THE PROPOSED DEVELOPMENT

The proposed development involves the construction of an Educational Establishment (All Saints College Maitland, St Peter's Campus) including adaptive reuse of the St Paul's Parish Hall, Multi-Purpose Centre, Signage and Staging at Lot 1 DP 69160, Lot 1 DP 1261532, Lot 1 DP 669283, Lot 2 DP 91268 (No. 20-24) Hunter Street, Horseshoe Bend NSW (the Subject Land). Figure 1.3 shows a plan of the proposed development.

1.3 ZONE R1 - GENERAL RESIDENTIAL

The western portion of the Subject Land was zoned R1 General Residential and the remainder of the Subject Land was zoned RE2 Private Recreation under the Maitland Local Environmental Plan 2011.

Objectives of the Zone R1 General Residential Zone, are:

- To provide for the housing needs of the community.
- To provide for a variety of housing types and densities.
- To enable other land uses that provide facilities or services to meet the day to day needs of residents.

Objectives of the Zone RE2 Private Recreation Zone, are:

- To enable land to be used for private open space or recreational purposes.
- To provide a range of recreational settings and activities and compatible land uses.
- To protect and enhance the natural environment for recreational purposes.

Job Ref	12655
A4 Scale	1:3500

0 100 200 m

Map Projection GDA94 MGA Zone 56

Data Sources: LPI (2022),Nearmap (2022)

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarentee is given that the information protrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

Figure 1.1

Location of Subject Land

20-24 Hunter Street
Horseshoe Bend, NSW

28 February 2022

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Job Ref	12655
A4 Scale	1:560

Disclaimer: While all reasonable care has been taken to ensure the information contained on this map is up to date and accurate, no guarentee is given that the information protrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

0 10 20 m

Map Projection GDA94 MGA Zone 56

Data Sources: LPI (2022),Nearmap (2022)

Figure 1.2

Aerial of Subject Land

20-24 Hunter Street
Horseshoe Bend, NSW

28 February 2022

WILDTHING Environmental Consultants
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Figure 1.3: Plan of Proposal

2.0 SUBJECT LAND CONTEXT

The Subject Land was located on the eastern side of Hunter Street, Horseshoe Bend. The site was situated within an established area of Maitland which was characterised by older dwellings with mature trees and gardens. The subject site is located within the Maitland City Council Local Government Area (LGA)

2.1 NSW BIODIVERSITY VALUES MAP

The NSW Biodiversity Values Map was viewed on the 21 February 2022. As of this date it was determined that there were no mapped 'Biodiversity Values' within the subject land. An extract of the Biodiversity Values Map has been provided in Figure 2.1.

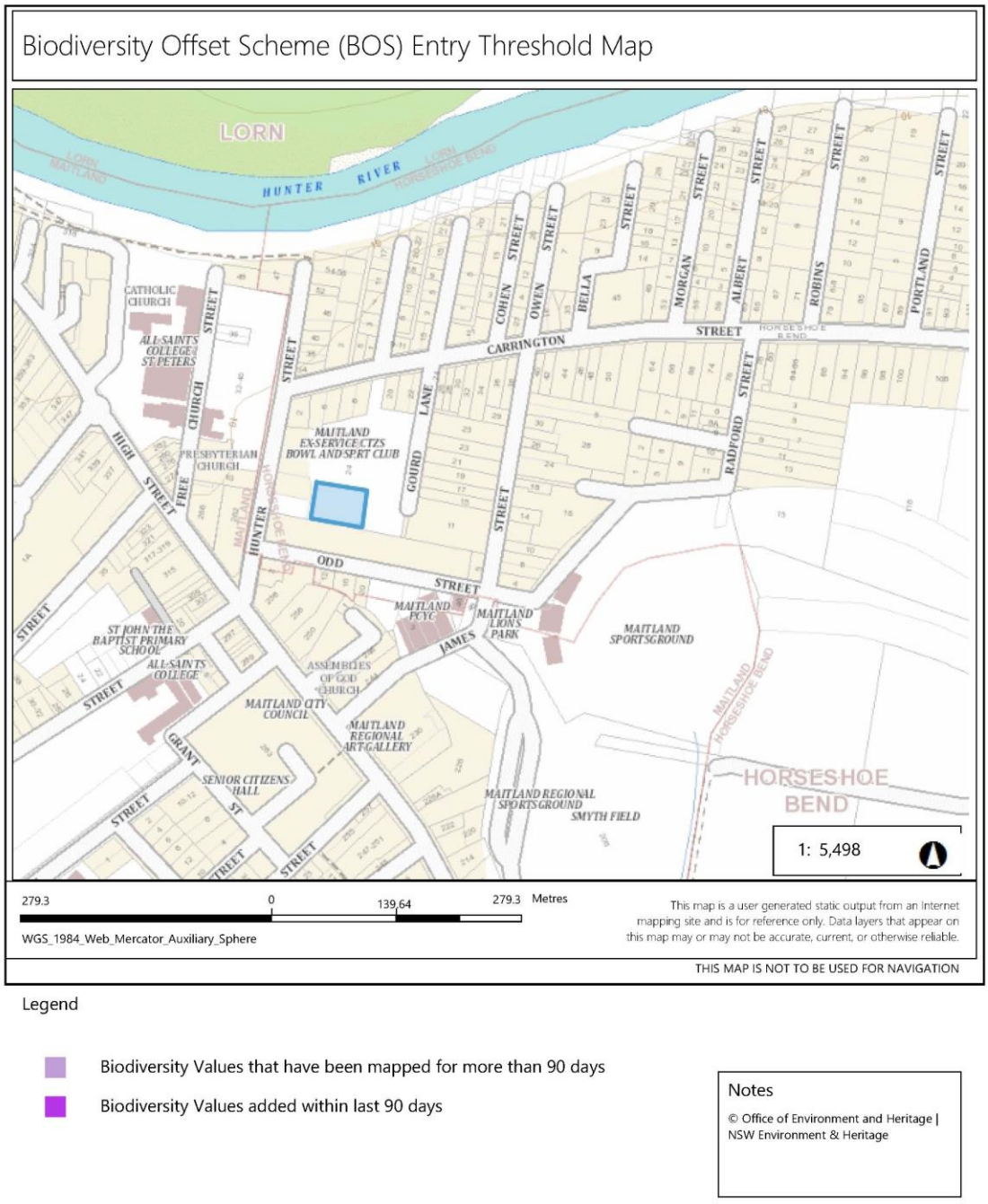

Figure 2.1: Biodiversity Values Map.

3.0 LEGISLATIVE CONTEXT

The following sections detail the legislative frameworks relevant to this report.

3.1 NSW ENVIRONMENTAL PLANNING AND ASSESSMENT AMENDMENT ACT 2017

The assessment of development applications in NSW is regulated under Part 4 or Part 5 of the EP&A Act. Part 1 Section 1.7 of the EP&A Act links proponents to Part 7 of the BC Act for the operation of the EP&A Act in connection with potential impacts to the terrestrial environment. The EP&A Act is also supported by other statutory environmental planning instruments, including State Environmental Planning Policies (SEPPs).

3.2 NSW BIODIVERSITY CONSERVATION ACT 2016

The purpose of the BC Act is "to establish a pathway to avoid, minimise and offset the impacts of proposed development and land use change on biodiversity and to establish a scientific method for assessing the likely impacts on biodiversity values of proposed development and land use change, for calculating measures to offset those impacts and for assessing improvements in biodiversity values".

In accordance with the BC Act, the Biodiversity Assessment Method (BAM) and entry into the Biodiversity Offsets Scheme (BOS) is applicable to certain development activities based on specific Preparation of a Biodiversity Development Assessment Report (BDAR) is required for a development application that meets any of the following criteria detailed in Table 3.1.

As the proposed development was not found to comply within any of the criteria it was determined that a BDAR and entry into the BOS threshold would not be applicable for this development. Thus, the survey methodology detailed in the following sections have been undertaken in accordance with the requirements for a standard Assessment of Significance.

The BC Act also imposes various obligations on determining authorities in relation to impacts on biodiversity values that are serious and irreversible. For applications for development consent under Part 4 of the EP&A Act these obligations generally require a decision-maker to refuse to grant development consent. In order to provide clarity regarding what could be considered a serious and irreversible impact a guidance document has been released (NSW Gov 2017) which identifies the species and ecological communities (SAII entities) that are likely to be the subject of serious and irreversible impacts. No candidate SAII entities were found to be present within the study area thus no obligation for development refusal would be applicable to this proposed development from relevant regulatory bodies.

Table 3.1: Criteria for entry into the Biodiversity Offsets Scheme in relation to the proposed development.

CRITERIA FOR ENTRY INTO THE BIODIVERSITY OFFSETS SCHEME (BOS)	SECTION CRITERIA ADDRESSED	ASSESSMENT OF CRITERIA
Part 4 development activities deemed to be 'State Significant' under the NSW Environmental Planning and Assessment Act 1979 (NSW EP&A Act)		The proposal is not recognised as State Significant
Development activities that have the potential to impact Areas of Outstanding Biodiversity Value (AOBV) as listed under Part 3 of the BC Act.	Section 7.0	No declared areas of outstanding biodiversity value were located within or in proximity to the site.
Development activities that have the potential to cause a significant impact on a threatened species, population or ecological community, listed under Schedules 1 and 2 of the BC Act, as determined by application of a five-part-test of significance in accordance with Section 7.3 of the BC Act;	Section 7.0	The five-part test found no significant impact on threatened species, populations or ecological communities listed under Schedules 1 and 2 of the BC Act.
Development activities that have the potential to impact areas mapped as having 'high biodiversity value' as indicated by the NSW Biodiversity Values Map (BV Map);	Section 3.0 Figure 3.1.	The NSW Biodiversity Values Map was consulted on the 7 February 2022. As of this date it was determined that there were no mapped 'Biodiversity Values' within the proposed development footprint. Consequently, the proposed development would not exceed the biodiversity offsets scheme threshold in regard to Section 7.2(b) of the BC Act.
Development activities that involve clearing of native vegetation that exceeds the Biodiversity Offset Scheme thresholds (BOS thresholds) as determined by the NSW BC regulation.	Section 6.0	The clearance threshold for the smallest lot in the proposal is 0.25ha. Due to the highly disturbed nature of the subject land clearance of native vegetation will not exceed 0.25ha. Consequently, the proposed development would not exceed the biodiversity offsets scheme threshold in regard to Section 7.2(b) of the BC Act.

3.3 STATE ENVIRONMENTAL PLANNING POLICY (KOALA HABITAT PROTECTION) 2021

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

Land to which Policy applies

(1) This Policy applies to each local government areas (LGAs) listed in Schedule 1.

(2) The whole of each local government area is—

- in the koala management area specified in Schedule 1 opposite the local government area, or
- (b) if more than 1 koala management area is specified, in each of those koala management areas.

(3) Despite subclause (1), this Policy does not apply to—

- land dedicated or reserved under the National Parks and Wildlife Act 1974, or acquired under Part 11 of that Act, or
- (b) land dedicated under the Forestry Act 2012 as a State Forest or a flora reserve, or
- (c) land on which biodiversity certification has been conferred, and is in force, under Part 8 of the Biodiversity Conservation Act 2016, or
- (d) land in the following land use zones, or an equivalent land use zone, unless the zone is in a local government area marked with an * in Schedule 1—
- Zone RU1 Primary Production,
- (ii) Zone RU2 Rural Landscape,
- (iii) Zone RU3 Forestry.

SEPP 2021 applies to each local government area (LGA) listed in Schedule 1, which includes land zoned R1 and RE2 in the Maitland City Council LGA. The site therefore falls under SEPP 2021 has been addressed in Section 8.0 of this report.

3.4 STATE ENVIRONMENTAL PLANNING POLICY (COASTAL MANAGEMENT) 2018 (CM SEPP).

The State Environmental Planning Policy (Coastal Management) 2018 (CM SEPP) updates and consolidates into one integrated policy SEPP 14 (Coastal Wetlands), SEPP 26 (Littoral Rainforests) and SEPP 71 (Coastal Protection), including clause 5.5 of the Standard Instrument – Principal Local Environmental Plan. These policies are now repealed.

The aim of this Policy is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area, by:

- managing development in the coastal zone and protecting the environmental assets of the coast, and

- establishing a framework for land use planning to guide decision-making in the coastal zone, and
- mapping the 4 coastal management areas that comprise the NSW coastal zone for the purpose of the definitions in the Coastal Management Act 2016.

These coastal management areas are:

- the coastal wetlands and littoral rainforests area,
- the coastal vulnerability area,
- the coastal environment area, and
- the coastal use area.

3.5 BIOSECURITY ACT 2015

The NSW Biosecurity Act 2015 provides regulatory controls and powers to manage noxious weeds in NSW. For weed management this Act divides NSW into regions based on combined LGAs and priority weeds for a region are listed. Some weeds are managed at a state level as they form part of a broader containment strategy. The legislation compliments listed Weeds of National Significance (WoNS).

3.6 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on Matters of National Environmental Significance (MNES) undergo a process of assessment. Under the EPBC Act, an action includes a project, undertaking, development or activity that may impact MNES. An action that 'has, will have or is likely to have a significant impact on a MNES' is deemed to be a 'controlled action' and may not be undertaken without prior approval from the Commonwealth Minister for the Department of Agriculture, Water and the Environment (DAWE).

MNES categories listed under the EPBC Act are:

- World heritage properties;
- National heritage places;
- Wetlands of international importance (Ramsar wetlands);
- Threatened species and ecological communities (Section 18 and 18A);
- Migratory species;
- Commonwealth marine areas;
- Nuclear actions (including uranium mining); and
- A water resource, in relation to coal seam gas development and large coal mining development.

Initially MNES protected under the EPBC Act are assessed in accordance with the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (DoE 2013). This is performed to determine if there is likelihood for an action to have a significant impact on MNES. An action will

require referral to, and may require the approval of, the commonwealth minister for the Environment (in addition to any local or state government consent or approval) if that action will have, or is likely to have, a significant impact on the environment or on a MNES.

3.7 LICENSING

Fieldwork undertaken by Wildthing Environmental Consultants was carried out under NPWS Scientific Investigation Licence SL100345 and under Animal Care and Ethics Approval: Animal Research Authority Issue by the Department of Primary Industries (Trim File No. 13/251) for Fauna Survey for Biodiversity and Impact Assessment.

4.0 METHODOLOGY

4.1 DESKTOP ASSESSMENT

A site-specific literature and database review was undertaken prior to conducting the field survey and the preparation of this report. A list of the resources reviewed, the date they were accessed and the spatial extent of the search conducted, where relevant, is provided in Table 4.1.

Table 4.1: Desktop Resources

RESOURCE	LAST ACCESS DATE	SPATIAL EXTENT
Zoning and Regulatory Maps		
Maitland LEP 2011 (Maitland City Council, 2011)	February 2022	Entire Subject Land
Biodiversity Values and Landscape Maps		
BioNet Atlas of NSW Wildlife (BioNet) (OEH, 2022a)	February 2022	10x10km radius of subject site
Commonwealth Protected Matters Search Tool (PMST) (DAWE 2022b)	February 2022	10x10km radius of subject site
The Vegetation of the Central Hunter Valley, New South Wales. (Peake 2006)	February 2022	10x10km radius of subject site
NSW Biodiversity Values Map (DPIE, 2022b)	February 2022	Entire Subject Site
SIX Maps (DPI 2022)	February 2022	Entire Subject Site
NSW Government SEED Mapping	February 2022	Entire Subject Site
Mitchell Landscape Maps, Version 2 (DECC) (2002).	February 2022	Entire Subject Site
Australia's IBRA Bioregions and sub-bioregions.	February 2022	Entire Subject Site
Threatened Species and Vegetation Databases		
Commonwealth species profiles and threats database (SPRAT) (DAWE 2022a)	February 2022	-
Profiles of threatened species, population, and ecological communities (DPIE 2022c)	February 2022	-
Bionet Atlas vegetation classification database (DPIE 2022d)	February 2022	-

4.2 FIELD ASSESSMENT

Fieldwork was undertaken on the 22 February 2022. A summary of the time spent on site during fieldwork and the prevailing weather conditions at the time is contained in Table 4.2.

Table 4.2: Survey Dates, Times and Weather Conditions

DATE	TIME	SURVEY EFFORT (PERSON HOURS)	ACTIVITY	WEATHER
Tuesday 22/02/22	0915- 1030	1.15 (one person)	General site inspection Vegetation Survey Diurnal fauna survey Tree Survey Incidental observations	7/8 Cloud, 23°C, 86% Relative Humidity, 14km/h wind.

A detailed methodology for the surveys listed within Table 4.2 above have been described in the following Sections 4.2.1 – 4.2.5:

4.2.1 VEGETATION ASSESSMENT

The initial determination of the basic vegetation community boundaries was undertaken through the review of an orthophoto covering the site. Following this, a detailed ground survey was conducted in accordance with the Department of Environment and Conservation's (NSW) Threatened Biodiversity Survey and Assessment Guidelines – Working Draft (Department of Environment and Conservation, 2004). Due to the high disturbance no vegetation plots or quadrats were undertaken. Flora searches were undertaken across the site in the manner described by Cropper (1993) as the 'Random Meander Technique'. This involved walking in a random manner throughout the entire site. A list of all flora species identified on site has been provided in Appendix A.

4.2.2 DIURNAL FAUNA SURVEY

Opportunistic sightings of species and secondary indications (scats, scratches, diggings, tracks etc.) of resident fauna were noted and included:

- dedicated searches for avifauna;
- dedicated searches for herpetofauna;
- Checks for obvious nests of raptors;
- checking trees (particularly smooth-barked species) for scratches consistent with arboreal mammals; and

4.2.3 GENERAL HABITAT FOR NATIVE SPECIES

From the vegetation appraisal, diurnal fauna survey and a general inspection of the site and surrounding areas, a subjective assessment of the general habitat value of this site was made. Considered in this assessment were:

- occurrence of that habitat type in the general vicinity;

- degree of disturbance and degradation;
- area occupied by that habitat on site;
- continuity with similar habitat adjacent to the site, or connection with similar habitat off site by way of corridors; and
- structural and floral diversity.

4.2.4 HABITAT FOR SIGNIFICANT SPECIES

The subject site was evaluated as potential habitat for each of the threatened species reported on the BioNet Atlas (DPIE, 2022a) and PMST (DAWE, 2022b) databases from within 10km of the site. This evaluation was based on home range, feeding, roosting, breeding, movement patterns and corridor requirements for fauna and hydrology, soil types, aspect and structural formation for flora species. The list of threatened species recorded within these databases is provided within Table 4.3 and an assessment of the likelihood of occurrence of these threatened species within the subject site is provided in Table 5.4.

4.2.5 TREE SURVEY

During the fieldwork, a survey was undertaken to identify trees within the site. The survey also involved identifying the number of hollow-bearing trees present. Hollow-bearing trees are a habitat resource utilised by a variety of native avifaunal and mammalian species. This resource is usually a limiting factor in the occurrence of hollow-dependent species on a site, due to the time taken for hollows to form in trees.

It must be noted that observations made from ground level may fail to record a small number of hollows that are obscured. Some entrances may also not lead to a cavity. The internal dimensions of the hollows are also impossible in many cases to determine from the ground.

4.3 SIGNIFICANT SPECIES

The following threatened species listed in Table 4.3 have been recorded on the BioNet Atlas and PMST Databases as occurring within 10km of the subject site. Species marked with an asterisk (*) are listed on the DAWE Protected Matters Database as having habitat likely to occur within 10km of the subject site.

Table 4.3: Threatened species, endangered populations and ecological communities considered.

Scientific Name	Common Name	BC Act 1995	EPBC Act 1999
Flora			
**Arthraxon hispidus*	Hairy-joint Grass	V	V
**Dichanthium setosum*	Bluegrass	V	V
**Caladenia tessellata*	Thick-lipped Spider-orchid	V	V
**Cryptostylis hunteriana*	Leafless Tongue-orchid	V	V
Diuris pedunculata	Small Snake Orchid	E	E
**Prasophyllum* sp. Wybong	A Leek Orchid		CE
Pterostylis chaetophora		V	
Pterostylis gibbosa	Illawarra Greenhood	E	E
**Rhizanthella slateri*	Eastern Underground Orchid	V	E

Scientific Name	Common Name	BC Act 1995	EPBC Act 1999
Dillwynia tenuifolia		V	
**Cynanchum elegans*	White-flowered Wax Plant	E	E
Eucalyptus glaucina	Slaty Red Gum	V	V
Eucalyptus parramattensis subsp. decadens	Earp's Gum	V	V
Acacia bynoeana	Bynoe's Wattle	E	V
**Syzygium paniculatum*	Magenta Lilly Pilly	E	V
**Rhodamnia rubescens*	Scrub Turpentine	E4A	CE
Callistemon linearifolius	Netted Bottle Brush	V	
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	V	V
Rhodomyrtus psidioides	Native Guava	E4A	
Persoonia hirsuta	Hairy Geebung	V	E
Tetratheca juncea	Back-eyed Susan	V	V
**Rutidosis heterogama*	Heath Wrinklewort	V	V
**Persicaria elatior*	Tall Knotweed	V	V
**Euphrasia arguta*		E4A	CE
**Thesium australe*	Austral Toadflax	V	V
Maundia triglochinoides		V	
Amphibians			
**Heleioporus australiacus*	Giant Burrowing Frog	V	V
Litoria aurea	Green and Golden Bell Frog	E	V
Litoria littlejohni	Littlejohn's Tree Frog	V	V
Mixophyes balbus	Stuttering Frog	V	V
Mixophyes iteratus	Giant Barred Frog	V	V
Reptiles			
**Delma impar*	Striped Legless Lizard	V	V
Birds			
Anseranas semipalmata	Magpie Goose	V	
Oxyura australis	Blue-billed Duck	V	
Stictonetta naevosa	Freckled Duck	V	
Ptilinopus magnificus	Wompoo Fruit-Dove	V	
Ephippiorhynchus asiaticus	Black-necked Stork	E	
Botaurus poiciloptilus	Australasian Bittern	E	E
Ixobrychus flavicollis	Black Bittern	V	
Rostratula australis	Australian Painted-snipe	E	E
Callocephalon fimbriatum	Gang-gang Cockatoo	V	
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	
Lathamus discolor	Swift Parrot	E	CE
Glossopsitta pusilla	Little Lorikeet	V	
Neophema pulchella	Turquoise Parrot	V	
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	
Climacteris picumnus victoriae	Brown Treecreeper	V	
**Anthochaera phrygia*	Regent Honeyeater	E4A	CE
**Grantiella picta*	Painted Honeyeater	V	V
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	
Chthonicola sagittata	Speckled Warbler	V	
Daphoenositta chrysoptera	Varied Sittella	V	
Pomatostomus temporalis temporalis	Grey-crowned Babbler	V	
Epthianura albifrons	White-fronted Chat	V	
Petroica boodang	Scarlet Robin	V	
**Erythrotriorchis radiatus*	Red Goshawk	CE	V
Circus assimilis	Spotted Harrier	V	
**Falco hypoleucos*	Grey Falcon	E	V
Falco subniger	Black Falcon	V	
Hamirostra melanosternon	Black-breasted Buzzard	V	
Hieraaetus morphnoides	Little Eagle	V	
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	
Pandion cristatus	Eastern Osprey	V	
Ninox connivens	Barking Owl	V	
Ninox strenua	Powerful Owl	V	
Tyto novaehollandiae	Masked Owl	V	

Scientific Name	Common Name	BC Act 1995	EPBC Act 1999
Tyto tenebricosa	Sooty Owl	V	
Migratory Birds			
**Actitis hypoleucos*	Common Sandpiper		M
**Calidris acuminata*	Sharp-tailed Sandpiper		M
**Calidris ferruginea*	Curlew Sandpiper	E	CE & M
**Numenius madagascariensis*	Eastern Curlew		CE & M
**Calidris melanotos*	Pectoral Sandpiper		M
**Charadrius leschenaultii*	Greater Sand Plover		V & M
**Apus pacificus*	Fork-tailed Swift		M
**Cuculus optatus*	Oriental Cuckoo		M
**Gallinago hardwickii*	Latham's Snipe		M
**Motacilla flava*	Yellow Wagtail		M
**Myiagra cyanoleuca*	Satin Flycatcher		M
**Monarcha melanopsis*	Black-faced Monarch		M
**Symposiachrus trivirgatus as Monarcha trivirgatus*	Spectacled Monarch		M
Hirundapus caudacutus	White Throated Needle-Tail		M
**Rhipidura rufifrons*	Rufous Fantail		M
**Pandion haliaetus*	Osprey		M
**Tringa nebularia*	Common Greenshank		M
Mammals			
**Dasyurus maculatus maculatus*	Spotted-tailed Quoll	V	V
Phascolarctos cinereus	Koala	V	V
**Petrogale penicillata*	Brush-tailed Rock-wallaby	E	V
**Potorous tridactylus tridactylus*	Long-nosed Potoroo	V	V
Petaurus norfolcensis	Squirrel Glider	V	
Petauroides volans	Greater Glider		V
Psuedomys novaehollandiae	New Holland Mouse		V
Pteropus poliocephalus	Grey-headed Flying-fox	V	V
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	
Mormopterus norfolkensis	Eastern Coastal Free-tailed Bat	V	
Miniopterus australis	Little Bentwing-bat	V	
Miniopterus orianae oceanensis	Large Bentwing-bat	V	
Myotis macropus	Southern Myotis	V	
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	
Scoteanax rueppellii	Greater Broad-nosed Bat	V	
Vespadelus troughtoni	Eastern Cave Bat	V	
Chalinolobus dwyeri	Large-eared Pied Bat	V	V
Endangered Populations (TSC Act)			
Cymbidium canaliculatum population in the Hunter Catchment		E2	
Eucalyptus camaldulensis population in the Hunter catchment		E2	
Endangered Ecological Communities			
Central Hunter Grey Box - Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions		E3	CE
Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions		E3	CE
*Central Hunter Valley eucalypt forest and woodland			E3
Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community			E3
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions		E3	
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions		E3	
Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion		V2	CE
Hunter Valley Vine Thicket in the NSW North Coast and Sydney Basin Bioregions		E3	
Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion		E4B	CE
Lower Hunter Spotted Gum-Ironbark Forest in the Sydney Basin Bioregion		E3	
Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions		V2	
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	CE

Scientific Name	Common Name	BC Act 1995	EPBC Act 1999
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Sydney Freshwater Wetlands in the Sydney Basin Bioregion		E3	
Warkworth Sands Woodland in the Sydney Basin Bioregion		E3	CE
White Box – Yellow Box – Blakely's Red Gum Woodland		E	CE
Lowland Rainforest of Subtropical Australia		E3	CE

E=Endangered Species E3=Endangered Ecological Community V=Vulnerable Species V2= Vulnerable Ecological Community
E4A/E4B/CE=Critically Endangered M=Migratory Species

5.0 RESULTS

5.1 FLORA ASSEMBLAGES

The Subject Land was situated within an established residential area of Maitland/Horseshoe Bend that was characterised by mature trees and gardens. The site was largely composed of maintained lawns, planted gardens, landscaping, carpark, planted trees and a small number of clumped mature trees. The majority of the site was composed of introduced flora species particularly maintained introduced grasses. Due to the disturbance, vegetation within the subject site was unable to be assigned a Plant Community Type (PCT) detailed in the NSW Vegetation Information System (VIS) classification database (DPIE, 2022).

Within the impact area of the proposal there were 17 mature tree species to be removed. Native species present included 3 large specimens of *Melaleuca quinquenervia* (Broad-leaved Paperbark) and 5 specimens of *Casuarina cunninghamiana* (River She-Oak). Two of the 17 canopy species requiring removal consisted of large specimens of *Olea europaea* subsp. *cuspidata* (African Olive) and *Ligustrum lucidum* (Large-leaved Privet). Other canopy species included *Fraxinus angustifolia* (Narrow-leaved Ash), *Pinus* sp., and *Platanus x acerifolia* (London Plane Tree). Decaying and fresh lawn clippings were discarded in a large area to the west of the clump of trees within the east of the Subject Land.

Common groundcovers over the majority of the subject site were the introduced *Chloris gayana* (Rhodes Grass), *Ehrhartia erecta* (Panic Veldt Grass), *Megathyrsus maximus* (Guinea Grass), *Paspalum dilatatum* (Paspalum), *Setaria gracilis* (Slender Pigeon Grass), *Cenchrus clandestinus* (Kikuyu), *Sida rhombifolia* (Paddy's Lucerne), *Bidens pilosa* (Cobblers Pegs), *Trifolium repens* (White-flowered Clover) and *Modiola carliniana* (Red-flowered Mallow). The few native groundcovers present included *Cynodon dactylon* (Common Couch) and *Microlaena stipoides* var. *stipoides* (Weeping Meadow Grass). Other invasive weed species within this area included *Ricinus communis* (Castor Oi Plantl) and *Vabina bonariensis* (Purple Top).

The Garden of Remembrance within the subject Land was heavily infested by weeds and contained some small tree species present, including *Cupressus* sp., and *Photinea* sp.

Photos of the vegetation within the subject site are shown in Plates 1-15. A full list of the flora species recorded during fieldwork is listed in Appendix A.

Plate 1: Narrow-leaved Ash within the west of the Subject Land.

Plate 2: Large African Olive requiring removal in the scope of the proposal.

Plate 3: Garden of Remembrance, which will require removal.

Plate 4: Gravel driveway, garden edging and maintained groundcovers within the subject land.

Plate 5: Facing south within the Subject Land looking at Garden of Remembrance.

Plate 6: Discarded lawn clippings within the Subject Land.

Plate 7: Gravel driveway/parking area and garden edging within the Subject Land (facing south)

Plate 8: Facing west within the Subject Land.

Plate 9: Introduced groundcovers at base of planted Narrow-leaved Ash.

Plate 10: Facing south at the north-western corner of Narrow-leaved Ash location within Subject Land.

Plate 11: Facing east at the concrete carpark in the northwest of the Subject Land.

Plate 12: Mature trees requiring removal in the east of the impact area.

Plate 13: Mature trees requiring removal within the Subject Land.

Plate 14: London Plane Tree within landscaped gardens.

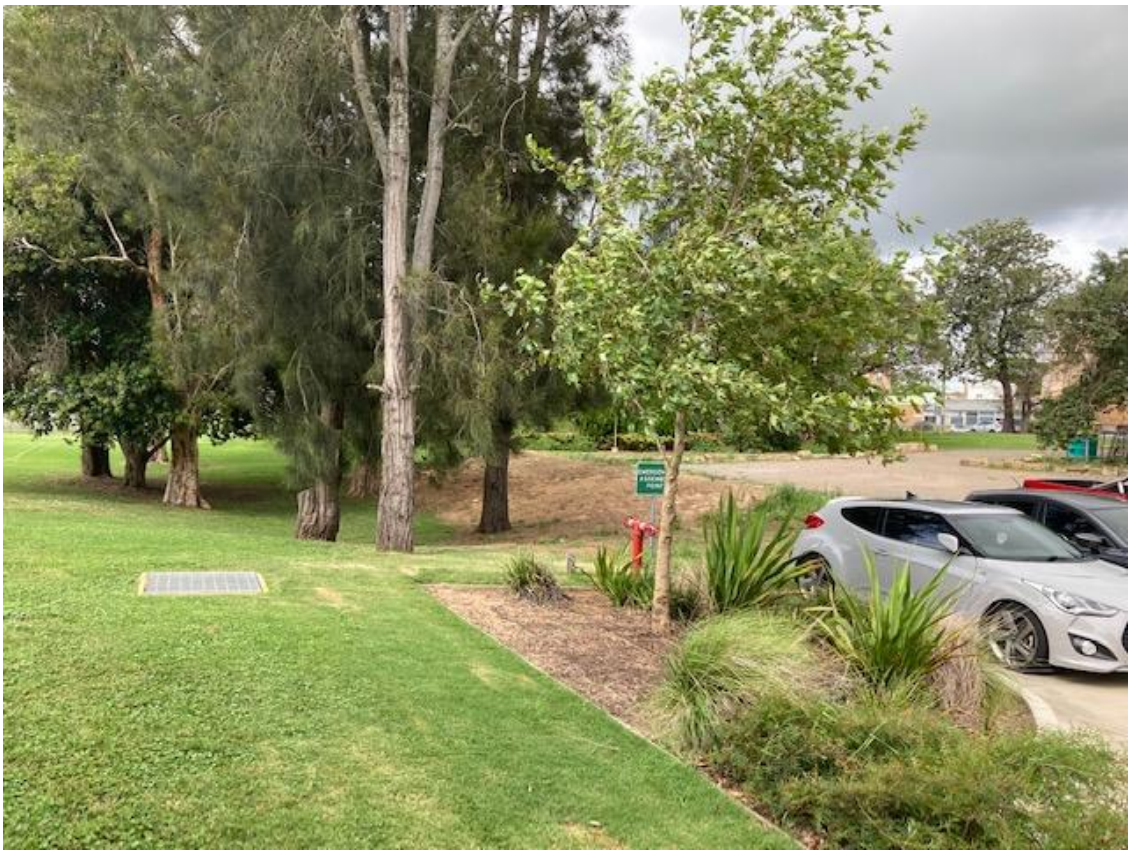

Plate 15: Facing south from the north-eastern corner of the study area.

5.1.1 THREATENED ECOLOGICAL COMMUNITIES

As a result of the highly disturbed nature of the site and lack of native flora no threatened ecological communities would be considered to be present within the site.

5.1.2 ENDANGERED POPULATIONS

Two Endangered Populations are listed in the local area:

- *Cymbidium canaliculatum* population in the Hunter Catchment;
- *Eucalyptus camaldulensis* (River Red Gum) – population in the Hunter Catchment.

No endangered populations or suitable habitat were present within the site.

5.1.3 THREATENED FLORA SPECIES

Twenty-six threatened plant species have been recorded within 10km of the subject site according to the BioNet database or are considered to have suitable habitat on the PMST database. The results of the database search conducted for threatened flora species is shown within Table 4.3.

During the flora survey no specimens of the above listed species were found. No suitable habitat was considered to be present for any of the listed threatened flora species.

5.1.4 PRIORITY WEEDS AND WEEDS OF STATE AND NATIONAL SIGNIFICANCE

A number of priority weed species listed under the Biosecurity Act 2015 were identified on site and are listed below in Table 5.1. The site lies within the Hunter Regional Weed Committee (HRWC).

Table 5.1: Priority Weed species found within the subject site.

WEED SPECIES	LEGAL REQUIREMENTS	ADDITIONAL SIGNIFICANCE
Senecio madagascariensis Fireweed	General Biosecurity Duty Prohibition on dealings	N
Olea europaea subsp. *cuspidata* African Olive	General Biosecurity Duty Regional Recommended Measure	T, N
Ligustrum lucidum Privet - broad-leaf	General Biosecurity Duty	
Ricinus communis Castor oil plant	General Biosecurity Duty	
Cirsium vulgare Spear thistle	General Biosecurity Duty	

T – Listed as a Threatening Process under the NSW BC Act 2016.
N –Weed of National Significance.

***Priorities under the Biosecurity Act 2015**

General Biosecurity Duty - any person dealing with plant matter must take measures to prevent, minimise or eliminate the biosecurity risk (as far as is reasonably practicable).

Prohibition on dealings - Must not be imported into the State or sold.

Regional Recommended Measure - Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce impacts from the plant on priority assets. Land managers prevent spread from their land where feasible. The plant or parts of the plant are not traded, carried, grown or released into the environment.

It is recommended that this weed be controlled within the site as part of routine site maintenance.

5.2 HABITAT APPRASIAL

5.2.1 HABITAT DESCRIPTION AND DISTRIBUTION IN THE VICINITY

Although generally highly disturbed, vegetation within the subject site offered potential habitat for a limited number of native species. The broad habitat type within the site consisted of Maintained Lawn, Planted Gardens and Mature Trees.

Maintained Lawn, Planted Gardens and Mature Trees

Mature trees would provide foraging and refuge for a small number of avifauna and mammal species. Frugivorous, nectivorous, granivorous and insectivorous birds and microchiropteran bat species would find potential foraging resources as part of a larger home range. No suitable hollows were observed within the trees.

5.2.2 TREE SURVEY

A total of 17 trees were recorded within the impact area. None of the trees were observed to contain any suitable hollows. Details of each tree including height, diameter at breast height (DBH), coordinates and fauna habitat attributes such as hollows are contained in Table 5.2 and their location can be seen in Figure 5.1. The number of the tree has been given to align with the Arborist report (Tattersall Lander 2022).

5.3 HABITAT FOR SIGNIFICANT SPECIES

An assessment of habitat attributes on site has been undertaken for the significant species listed in Table 4.3. The results of the assessment using definitions shown in Table 5.3 are displayed in Table

5.4. Threatened species identified in this assessment as having potential habitat available on site have been considered further in Section 7.0 of this report.

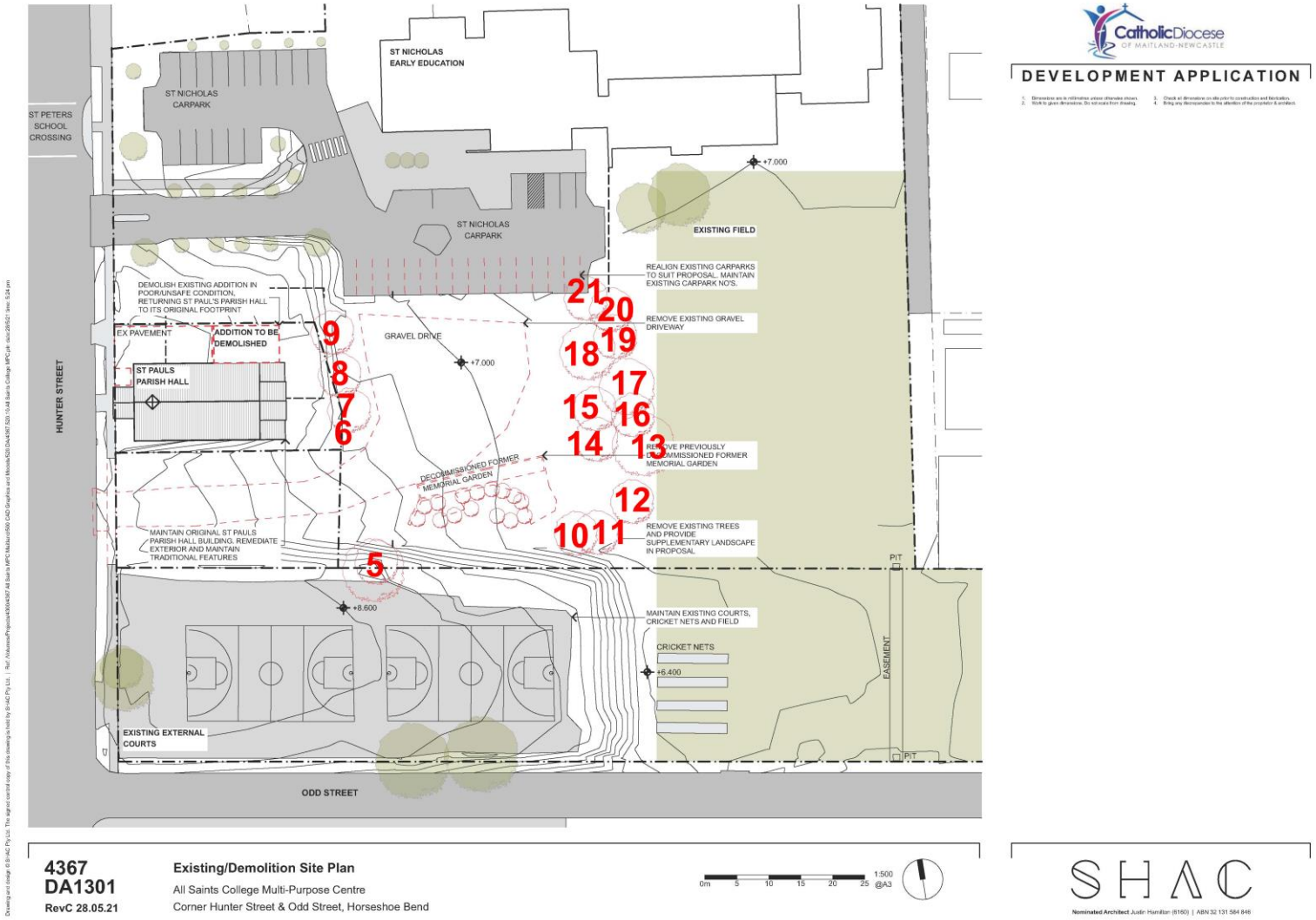

Figure 5.1: Mature trees to be removed in the scope of the proposal.

Table 5.2: Details of Trees located within the site.

No.	No. in Arborist Report	Tree Species	Easting	Northing	*DBH (m)	*Height (m)	**Hollows/Habitat	Removal Required?
1	5	*Olea europaea* subsp. *cuspidata* African Olive	365148	6377100	0.89	17	No	**Yes**
2	6	*Fraxinus angustifolia* Narrow-leaved Ash	365148	6377125	0.59	15	No	**Yes**
3	7	*F. angustifolia*	365148	6377129	0.57	16	No	**Yes**
4	8	*F. angustifolia*	365151	6377134	0.35	11	No	**Yes**
5	9	*F. angustifolia*	365149	6377142	0.40	12	No	**Yes**
6	10	*Pinus* sp.	365179	6377097	0.17	5	No	**Yes**
7	11	*Pinus* sp.	365182	6377098	0.44	16	No	**Yes**
8	12	*Melaleuca quinquenervia* Broad-leaved Paperbark	365188	6377102	0.65	16	No	**Yes**
9	13	*Casuarina cunninghamiana* River She-Oak	365192	6377111	0.76	18	No	**Yes**
10	14	*C. cunninghamiana*	365188	6377113	0.41	14	No	**Yes**
11	15	*M. quinquenervia*	365188	6377119	0.58	15	No	**Yes**
12	16	*Ligustrum lucidum* Broad-leaf Privet	365192	6377118	0.70	14	No	**Yes**
13	17	*M. quinquenervia*	365192	6377121	0.60	15	No	**Yes**
14	18	*C. cunninghamiana*	365186	6377125	0.48	15	No	**Yes**
15	19	*C. cunninghamiana*	365192	6377126	0.51	14	No	**Yes**
16	20	*C. cunninghamiana*	365192	6377132	0.41	14	No	**Yes**
17	21	*Platanus x acerifolia* London Plane Tree	365191	6377137	0.10	5	No	**Yes**

****Habitat/Hollows** –

Class 1 –very large sized hollow openings (i.e. >20cm) suitable for species such as Owls
Class 2 – large sized hollow openings (i.e. 15-20cm) suitable for species such as Possums
Class 3 –medium sized hollow-openings (i.e. 5-15cm) suitable for species such as Gliders and Possums
Class 4 – small sized hollow openings (i.e. <5cm) suitable for species such as microchiropteran bats
Spout - Hollow opening towards sky offering little protection from the weather.

Table 5.3: Definitions of likelihood of occurrence criteria.

Likelihood of Occurrence	Threatened Fauna	Threatened Flora
Unlikely	Suitable habitat is absent from the study area and/or the study area is outside of the species known distribution	
Low	• The species has not been recorded in the locality (10km) within the last five years; and/or • Although suitable habitat is present in the study area the suitable habitat is in a highly modified, limited or degraded state; and/or • This species may be an occasional visitor, but habitat similar or of higher quality is widely distributed in the local area.	• The species has not been recorded in the locality (10km) within the last five years, and/or • Although suitable habitat is present in the study area the suitable habitat is in a highly modified or degraded state
Moderate	• The species has been recorded in the locality (10km) within the last five years; and/or • It is unlikely to be dependent on habitat within the study area (i.e. for breeding or important life cycle periods) or to maintain a permanent resident population. However, the species may seasonally, opportunistically or occasionally use resources within the study area; and/or • Although suitable habitat is present in the study area the suitable habitat is in a moderately modified, limited or degraded state This category includes fauna species that were targeted by seasonal surveys and were not recorded, wide ranging species which may fly-over' the site, regardless of the habitat types present and generalist species with non-specific habitat requirements	• The species has been recorded in the locality (10km) within the last five years; and/or. • Although potential habitat is present in the study area the suitable habitat is in a moderately modified or degraded state. This category includes flora species that were targeted by seasonal surveys and were not recorded.
High	• The species has been recorded in the locality (10km) within the last five years; and/or • It is highly likely that the species inhabits the study area and is dependent on identified suitable habitat (i.e. for breeding or important life cycle periods) and is likely to maintain a resident population. This includes species that are known to visit the study area during regular seasonal movements or migration.	• The species has been recorded in the locality (10km) within the last five years; and/or • It is highly likely to inhabit the study area and is dependent on identified suitable habitat.
Known	The species was observed in the study area during the current survey and/or was recorded during a survey conducted on the site during the last 5 years.	

Table 5.4: Habitat Assessment for Significant Species

SPECIES	STATUS	HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
Arthraxon hispidus Hairy-Joint Grass	BC Act 2016 – V EPBC Act 1999 – V	Occurs over a wide area in south-east Queensland, and on the northern tablelands and north coast of NSW, but is never common. Moisture and shade-loving grass, found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps.	**Unlikely** Suitable habitat was absent.
**Dichanthium setosum* Bluegrass	BC Act 2016 – V EPBC Act 1999 – V	Bluegrass occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland. Associated with heavy basaltic black soils and red-brown loams with clay subsoil.	**Unlikely** Suitable habitat was absent.
Caladenia tessellata Thick-lipped Spider-orchid	BC Act 2016-E EPBC Act 1999-V	Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. Is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW.	**Unlikely** No suitable habitat was present.
Cryptostylis hunteriana Leafless Tongue-orchid	BC Act 2016-V EPBC Act 1999-V	Grows in swamp-heath on sandy soils, chiefly in coastal districts, south from the Gibraltar Range. It is known historically from several localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra (although it is uncommon at all sites). Also recorded at Munmorah State Conservation Area, Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park and Ben Boyd National Park.	**Unlikely** No suitable habitat was present.
Diuris pedunculata Small Snake Orchid	BC Act 2016-E EPBC Act 1999-E	Confined to north east NSW. It was originally found scattered from Tenterfield south to the Hawkesbury River. Mainly found on the New England Tablelands, around Armidale, Uralla, Guyra and Ebor. Grows on grassy slopes or flats, often on peaty soils in moist areas. Also occurs on shale and trap soils, on fine granite, and among boulders. It flowers during August-October.	**Unlikely** No suitable habitat was present.
Prasophyllum sp. Wybong A Leek Orchid	EPBC Act 1999–CE	Leek orchids are generally found in shrubby and grassy habitats in dry to wet soil (Jones 2006). Known to occur in open eucalypt woodland and grassland.	**Unlikely** Suitable habitat was absent.
Pterostylis chaetophora	BC Act 2016-V	The preferred habitat is seasonally moist, dry sclerophyll forest with a grass and shrub understorey.	**Unlikely** Suitable habitat was absent.
Pterostylis gibbosa Illawarra Greenhood	BC Act 2016-E EPBC Act 1999-E	All known sub-populations occur in open forest and woodland on flat or gently sloping land with poorly drained soils. Within the Hunter Valley this orchid species is confined to the Milbrodale area.	**Unlikely** Suitable habitat was absent.
Rhizanthella slateri Eastern Underground Orchid	BC Act 2016-V EPBC Act 1999-E	Occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Grows in sclerophyll forest in shallow to deep loams.	**Unlikely** Suitable habitat was absent.

SPECIES	STATUS	HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
Dillwynia tenuifolia	BC Act 2016-V	*Eucalyptus fibrosa* is usually the dominant canopy species. *Eucalyptus globoidea*, *E. longifolia*, *E. parramattensis*, *E. sclerophylla* and *E. sideroxylon* may also be present or codominant, with *Melaleuca decora* frequently forming a secondary canopy layer. Associated species may include *Allocasuarina littoralis*, *Angophora bakeri*, *Aristida* spp. *Banksia spinulosa*, *Cryptandra* spp. *Daviesia ulicifolia*, *Entolasia stricta*, *Hakea sericea*, *Lissanthe strigosa*, *Melaleuca nodosa*, *Ozothamnus diosmifolius* and *Themeda australis*. *D. tenuifolia* is often found in association with other threatened species such as *Dodonaea falcata*, *Grevillea juniperina*, *Micromyrtus minutiflora*, *Pultenaea parviflora* and *Styphelia laeta*. At Yengo *D. tenuifolia* is reported to occur in disturbed escarpment woodland on Narrabeen sandstone. Associated tree species include *Eucalyptus eximia*, *E. punctata*, *E. sparsifolia* and *Callitris endlicheri*. The shrub layer is dominated by *D. tenuifolia*, *Leucopogon muticus*, *Leptospermum parvifolium* and *Pultenaea microphylla* (Maryott-Brown & Wilks 1993).	**Unlikely** No suitable habitat was present.
Cynanchum elegans White-flowered Wax Plant	BC Act 2016 – E EPBC Act 1999 – E	This species occurs in scattered coastal localities from the QLD-NSW border south to Wollongong. Found in dry, littoral or subtropical rainforest, and occasionally in scrub and woodland from sea level to about 600m ASL.	**Unlikely** Suitable habitat was absent.
Eucalyptus glaucina Slaty Red Gum	BC Act 2016 – V EPBC Act 1999 – V	Grows in grassy woodland and dry eucalypt forest, usually on deep, moderately fertile and well-watered soils. This species has only been recorded on the north coast of NSW and in small populations from Taree to Broke and west of Maitland.	**Unlikely** Suitable habitat was absent.
Eucalyptus parramattensis subsp. decadens	BC Act 2016 – V EPBC Act 1999 – V	Generally, occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant. In the Kurri Kurri area, *E. parramattensis* subsp. *decadens* is a characteristic species of 'Kurri Sand Swamp Woodland and in the Tomago Sandbeds area, the species is usually associated with the 'Tomago Swamp Woodland'.	**Unlikely** No suitable habitat was present.
Acacia bynoeana	BC Act 2016-E EPBC Act 1999-V	Found in heath, woodland and dry sclerophyll forests on sandy soils derived from Hawkesbury Sandstone. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leafed Apple but has also been recorded within Spotted Gum – Ironbark forest at its most northerly extent in North Rothbury in the Hunter Valley. Found in central eastern NSW, from the Hunter District (Morisset, Kurri Kurri & North Rothbury) south to the Southern Highlands and west to the Blue Mountains.	**Unlikely** No suitable habitat was present.
Syzygium paniculatum Magenta Lilly Pilly	BC Act 2016-E EPBC Act 1999-V	Occurs in a narrow coastal distribution in rainforests on sandy soils or stabilised coastal dunes from Jervis Bay to Bulahdelah in NSW.	**Unlikely** Suitable habitat was absent.
Rhodamnia rubescens Scrub Turpentine	BC Act 2016-E4A	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Found in littoral, warm temperate and	**Unlikely** Suitable habitat was absent.

SPECIES	STATUS	HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	EPBC Act 1999-CE	subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	
Callistemon linearifolius Netted Bottle Brush	BC Act 2016 – V EPBC Act 1999 – V	Grows in dry sclerophyll forest on the coast and adjacent ranges. From the Georges River to the Hawkesbury River in the Sydney area, and north to Nelson Bay. Known to occur within Stony Ridge Reserve on Soldiers Point.	**Unlikely** Suitable habitat was absent.
Grevillea parviflora subsp. parviflora	BC Act 2016 – V EPBC Act 1999 – V	Occurs in a range of vegetation types from heath and shrubby woodland to open forest. In Sydney it has been recorded from Shale Sandstone Transition Forest and in the Hunter in Kurri Sand Swamp Woodland. however, other communities occupied include Corymbia maculata - Angophora costata open forest in the Dooralong area, in Sydney Sandstone Ridgetop Woodland at Wedderburn and in Cooks River / Castlereagh Ironbark Forest at Kemps Creek.	**Unlikely** Suitable habitat was absent.
Rhodomyrtus psidioides	BC Act 2016-E4A	Occurs from Broken Bay New South Wales to Maryborough in Queensland. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	**Unlikely** No suitable habitat was present.
Persoonia hirsuta	BC Act 2016-E EPBC Act 1999-E	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.	**Unlikely** No suitable habitat was present.
Tetratheca juncea Black-eyed Susan	BC Act 2016 – V EPBC Act 1999 – V	Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the local government areas of Central Coast, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock. Found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest.	**Unlikely** No suitable habitat was present.
Rutidosis heterogama Heath Wrinklewort	BC Act 2016 – V EPBC Act 1999 – V	Grows in heath on sandy soils and moist areas in open forest, and has been recorded along disturbed roadsides. Recorded from near Cessnock to Kurri Kurri with an outlying occurrence at Howes Valley. On the Central Coast it is located north from Wyong to Newcastle.	**Unlikely** Suitable habitat was absent.
Persicaria elatior	BC Act 2016 – V EPBC Act 1999 – V	Recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertsocaleyin, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). Grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	**Unlikely** Suitable habitat was absent.
Euphrasia arguta Eyebright	BC Act 2016 - E4A EPBC Act 1999 – CE	Found within the Nundle area reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance.	**Unlikely** Suitable habitat was absent.
Thesium australe Austral Toadflax	BC Act 2016-V	Grows in grassland or woodland, often in damp sites.	**Unlikely** Suitable habitat was absent.

SPECIES	STATUS	HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	EPBC Act 1999-V		
Maundia triglochinoides	BC Act 2016-V	Grows in swamps, lagoons, dams, channels, creeks or shallow freshwater 30 - 60 cm deep on heavy clay, low nutrients.	**Unlikely** No suitable habitat was present.
Heleioporus australiacus Giant Burrowing Frog	BC Act 2016-V EPBC Act 1999-V	Banks of semi-permanent to ephemeral sand or rock-based streams and has also been identified in dams, drainage ditches and roadside culverts.	**Unlikely** No suitable habitat was present.
Litoria aurea Green and Golden Bell Frog	BC Act 2016 – E EPBC Act 1999 – V	Inhabits swamps, lagoons, streams and ponds as well as dams, drains and storm water basins.	**Unlikely** No suitable aquatic habitat was present.
Litoria littlejohni Littlejohn's Tree Frog	BC Act 2016-V EPBC Act 1999-V	Habitats include wet and dry sclerophyll forest, coastal woodland and heath. Associated characteristics include rocky streams and sandstone outcrops, semi-permanent dams and slow flowing streams. The water quality required for breeding is usually tannic (pH 6.2) and contains detritus which is used as anchors for egg clusters.	**Unlikely** No suitable habitat was present.
Mixophyes balbus Stuttering Frog	BC Act 2016-E EPBC Act 1999-V	Occurs in wet forest regions of south-eastern Queensland, Eastern NSW and Victoria. In late spring, eggs are deposited among leaf litter on the banks of streams and subsequently are washed into the water during heavy rain.	**Unlikely** No suitable habitat was present.
Mixophyes iteratus Giant Barred Frog	BC Act 2016-E EPBC Act 1999-E	Distributed from Doongul Creek, Wongi State Forest, near Maryborough in south-eastern Queensland (Hines 2003), south to Warrimoo in the Blue Mountains, New South Wales. Occurs in rainforests and wet sclerophyll forests in upper to lower catchment areas (Ingram & McDonald 1993).	**Unlikely** Suitable habitat was absent.
Delma impar Striped Legless Lizard	BC Act 2016 – E EPBC Act 1999– E	Occurs in the Southern Tablelands, the South West Slopes, the Upper Hunter and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma, Muswellbrook and Tumut areas. Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland.	**Unlikely** No suitable habitat was present.
Anseranas semipalmata Magpie Goose	BC Act 2016-V	Relatively common in the Australian northern tropics. Records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.	**Unlikely** Suitable habitat was absent.
Oxyura australis Blue-billed Duck	BC Act 2016-V	Endemic to south-eastern and south-western Australia. It is widespread in NSW. Most common in the southern Murray-Darling Basin area. Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation.	**Unlikely** No suitable habitat was present.
Stictonetta naevosa	BC Act	Found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It	**Unlikely**

SPECIES	STATUS	HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
Freckled Duck	2016-V	breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and Lachlan Rivers, and other rivers within the Riverina. The duck is forced to disperse during extensive inland droughts when wetlands in the Murray River basin provide important habitat. The species may also occur as far as coastal NSW and Victoria during such times.	No suitable habitat was present.
Ptilinopus magnificus Wompoo Fruit-Dove	BC Act 2016-V	Occurs along the coast and coastal ranges from the Hunter River in NSW to Cape York Peninsula. It is rare south of Coffs Harbour. Found in, or near rainforest, low elevation moist eucalypt forest and brush box forests.	**Unlikely** Suitable habitat was absent.
Ephippiorhynchus asiaticus Black-necked Stork	BC Act 2016-E	Black-necked Storks are mainly found on shallow, permanent, freshwater terrestrial wetlands, and surrounding marginal vegetation, including swamps, floodplains, watercourses and billabongs, freshwater meadows, wet heathland, farm dams and shallow floodwaters, as well as extending into adjacent grasslands, paddocks and open savannah woodlands.	**Unlikely** Suitable habitat was absent.
Botaurus poiciloptilus Australasian Bittern	BC Act 2016 – E EPBC Act 1999– E	The Australasian Bittern lives alone or in loose groups and favours permanent fresh-waters dominated by sedges, rushes, reeds or cutting grasses (eg. *Phragmites, Scirpus, Eleocharis, Juncus, Typha, Baumea* and *Gahnia*) and feeds on insects, small fish, eels, frogs and other aquatic life, sometimes in rice fields.	**Unlikely** Suitable habitat was absent.
Ixobrychus flavicollis Black Bittern	BC Act 2016-V	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	**Unlikely** No suitable habitat was present.
Rostratula australis Australian Painted Snipe	BC Act 2016 – E EPBC Act 1999– E	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys.	**Unlikely** No suitable habitat was present.
Callocephalon fimbriatum Gang-gang Cockatoo	BC Act 2016-V	Tall montane forests and woodlands in mature wet sclerophyll forests. Requires hollows in which to breed between October and January. This Cockatoo species would be an infrequent visitor to the local area.	**Unlikely** No suitable habitat was present.
Calyptorhynchus lathami Glossy Black Cockatoo	BC Act 2016-V	Lowland coastal forests, dense mountain forests, semi-arid woodland and trees bordering watercourses, with (Allo)Casuarina trees for foraging.	**Unlikely** No suitable habitat was present.
Lathamus discolor Swift Parrot	BC Act 2016 – E EPBC Act 1999 – CE &M	Open Forest to Woodland, also street trees and in parks and gardens, winter flowering eucalypts for feeding. This species nests in Tasmania during the summer months.	**Unlikely** No Important Areas were mapped within the Subject Land for this species. No suitable habitat was present.
Glossopsitta pusilla Little Lorikeet	BC Act 2016 – V	Tall Open Forests, woodlands, orchards, parks and street trees.	**Low** Marginal transitory habitat was

SPECIES	STATUS	HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
			present.
Neophema pulchella Turquoise Parrot	BC Act 2016 – V	Lives on the edges of Eucalypt woodland adjoining clearings and on timbered ridges and creeks in farmland. It has also been recorded utilising roadside verges and orchards. Nests in small hollow branches of Eucalypts.	**Low** Marginal transitory habitat was present.
Artamus cyanopterus cyanopterus Dusky Woodswallow	BC Act 2016 - V	The Dusky Woodswallow is found in open forests and woodlands, and may be seen along roadsides and on golf courses.	**Low** Marginal transitory habitat was present.
Climacteris picumnus victoriae Brown Treecreeper	BC Act 2016 – V	This species is a medium sized insectivorous bird that occupies Eucalypt woodlands, particularly open woodlands lacking a dense understorey, River Red Gums on watercourses and around lakeshores. It is sedentary and nests in tree hollows within permanent territories.	**Unlikely** Suitable habitat was absent.
Anthochaera phrygia Regent Honeyeater	BC Act 2016 – E4A EPBC Act 1999 – E&M	Temperate woodlands and open forest, including forest edges, preferring to forage on large-flowered Eucalypts.	**Unlikely** No Important Areas were mapped within the Subject Land for this species. Suitable habitat was absent.
Grantiella picta Painted Honeyeater	BC Act 2016 – V	Nomadic, within a range of generally drier forested areas with mistletoes.	**Unlikely** Suitable habitat was absent.
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies)	BC Act 2016 – V	Usually found on the western side of the Great Dividing Range in dry sclerophyll forests and woodlands containing box-ironbark associations and River Red Gum. In the Hunter Valley this species is known to utilise drier coastal woodlands. Usually found in open woodlands.	**Unlikely** Suitable habitat was absent.
Chthonicola sagittata Speckled Warbler	BC Act 2016 – V	Speckled Warblers live in a wide range of eucalypt-dominated vegetation that has a grassy understorey, often on rocky ridges or in gullies. It builds a domed nest of grass, bark shreds and moss, lined with fur on the ground.	**Unlikely** Suitable habitat was absent.
Daphoenositta chrysoptera Varied Sittella	BC Act 2016 – V	Open eucalypt woodland/forest, mallee, inland acacia, coastal tea-tree scrubs, golf courses, orchards and parks.	**Low** Marginal transitory habitat was present.
Pomatostomus temporalis ssp. *temporalis* Grey-crowned Babbler	BC Act 2016 – V	Open forest, woodland, scrubland, farmland and outer suburbs. Prefers woodlands with regenerating trees, tall shrubs, and an intact ground cover of grass and forbs.	**Unlikely** Suitable habitat was absent.
Epthianura albifrons White-fronted Chat	BC Act 2016 – V	In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. 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.	**Unlikely** Suitable habitat was absent.

SPECIES	STATUS	HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
Petroica boodang Scarlet Robin	BC Act 2016 – V	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs.	**Unlikely** Suitable habitat was absent.
Erythrotriorchis radiatus Red Goshawk	BC Act 2016 – E4A EPBC Act 1999 – V	The species is very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. In NSW, preferred habitats include mixed subtropical rainforest, *Melaleuca* swamp forest and riparian *Eucalyptus* forest of coastal rivers.	**Unlikely** Suitable habitat was absent.
Circus assimilis Spotted Harrier	BC Act 2016 – V	This bird of prey occurs most commonly in native grassland and is also found in agricultural areas. Other habitat areas include grassy open woodland including acacia and mallee remnants.	**Unlikely** Suitable habitat was absent.
Falco hypoleucos Grey Falcon	BC Act 2016 – E EPBC Act 1999 – V	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Generally restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	**Unlikely** Suitable habitat was absent.
Falco subniger Black Falcon	BC Act 2016 – V	Widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions.	**Low** Hunting habitat is available for this species across the site.
Hamirostra melanosternon Black-breasted Buzzard	BC Act 2016 – V	Found sparsely in areas of less than 500mm rainfall, from north-western NSW and north-eastern South Australia to the east coast at about Rockhampton. Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. Hunts over grasslands and sparsely timbered woodlands.	**Low** Hunting habitat is available for this species across the site.
Hieraaetus morphnoides Little Eagle	BC Act 2016 – V	Is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used.	**Low** Hunting habitat is available for this species across the site.
Haliaeetus leucogaster White-bellied Sea-Eagle	BC Act 2016-V EPBC Act 1999 - M	Occupies habitat characterised by the presence of large areas of open water and feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans. The nests are built in a variety of sites including tall trees, bushes, mangroves, cliffs, rocky outcrops, caves, crevices, on the ground or even in artificial structures.	**Unlikely** Suitable habitat was absent.
Pandion cristatus Eastern Osprey	BC Act 2016-V	Found right around the Australian coast line. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feeds on fish over open waters.	**Unlikely** This species is unlikely to utilise the site.
Ninox connivens	BC Act 2016-V	Is found in forest and woodland, encountered most commonly in savanna and paperbark woodlands. It sometimes roosts in rainforests, but it requires the more open country for hunting and hollow Eucalypts for breeding.	**Unlikely** Suitable habitat was absent.
Ninox strenua Powerful Owl	BC Act 2016 – V	Inhabits a wide range of vegetation types from wet Eucalypt forests with a Rainforest understorey to Dry Open Forests and Woodlands. The species has been recorded utilising disturbed habitats such as exotic pine plantations and large trees in parks and gardens. Powerful Owls nest in a slight depression	**Unlikely** Suitable habitat was absent.

SPECIES	STATUS	HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
		in the wood-mould on the base of a cavity in a large old tree, sometimes in excess of 25 metres above the ground.	
Tyto novaehollandiae Masked Owl	BC Act 2016-V	A range of wooded habitats that contain mature trees with large hollows for roosting and nesting, and more open areas for hunting.	**Unlikely** Suitable habitat was absent.
Tyto tenebricosa	BC Act 2016-V	Prefers dense dimly-lit forests, inhabiting pockets of rainforest and wet sclerophyll forest mainly in mountainous areas, often in south-east facing gullies.	**Unlikely** Suitable habitat was absent.
Actitis hypoleucos Common Sandpiper	EPBC Act 1999 - M	Shallow pebbly, muddy or sandy edges of rivers and streams, coastal and inland; dams, lakes, sewage ponds, margins of tidal rivers, waterways in mangroves or saltmarsh; mudflats; rocky or sandy beaches.	**Unlikely** Suitable habitat was absent.
Calidris acuminata Sharp-tailed Sandpiper	EPBC Act 1999 - M	Tidal mudflats, saltmarshes, mangroves; shallow fresh, brackish or saline inland wetlands; sewage ponds and irrigated pastures.	**Unlikely** Suitable habitat was absent.
Calidris ferruginea Curlew Sandpiper	BC Act 2016-E EPBC Act 1999 -M	Tidal mudflats; saltmarsh; fresh, brackish or saline wetlands; sewage ponds.	**Unlikely** Suitable habitat was absent.
Numenius madagascariensis Eastern Curlew	EPBC Act 1999 - CE	Estuaries, tidal mudflats, sandspits, saltmarshes, mangroves; occasionally fresh or brackish lakes.	**Unlikely** Suitable habitat was absent.
Calidris melanotos Pectoral Sandpiper	EPBC Act 1999 -M	The Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	**Unlikely** Suitable habitat was absent.
Charadrius leschenaultii Greater Sand Plover	EPBC Act 1999 -V & M	The species occurs at numerous and widespread sites in Australia, especially along the north coast.	**Unlikely** Suitable habitat was absent.
Apus pacificus Fork-tailed Swift	EPBC Act 1999 - M	Inhabits the airspace over open country from semi deserts to coasts.	**Low** Due to the non-specific habitat requirements of this species habitat was considered to be present.
Cuculus optatus Oriental Cuckoo	EPBC Act 1999 -M	Inhabits a range of forests, typically feeding on insects and larvae.	**Unlikely** Suitable habitat was absent.
Gallinago hardwickii Latham's Snipe	EPBC Act 1999 – M	Utilises a variety of habitat, such as soft wet ground or shallow water with tussock and other green and dead vegetation, and scrub or open wetland from sea-level to alpine bogs.	**Unlikely** Suitable habitat was absent.
Motacilla flava Yellow Wagtail	EPBC Act 1999 - M	Habitat includes paddocks, and marshes. Open country near swamps, salt marshes, sewerage ponds, grassed surrounds to airfields, bare ground; occasionally on drier inland plains. Rare but regular visitor around the Australian coast, especially the NW coast; Broome to Darwin.	**Unlikely** No suitable habitat was present.

SPECIES	STATUS	HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
Myiagra cyanoleuca Satin Flycatcher	EPBC Act 1999 - M	Heavily vegetated gullies in forests and taller woodlands. During migration this species also utilises coastal forests, woodlands, mangroves, remnant trees in paddocks and gardens.	**Low** Suitable habitat was present.
Monarcha melanopsis Black-faced Monarch	EPBC Act 1999 - M	Utilises a range of habitats including rainforests, eucalypt woodlands & coastal scrubs.	**Unlikely** Suitable habitat was absent.
Symposiachrus trivirgatus as Monarcha trivirgatus	EPBC Act 1999 - M	Usually considered a denizen of the dense rainforests and moist eucalypt forests of eastern and north-eastern Australia, the Spectacled Monarch sometimes also inhabits mangroves and other densely vegetated habitats.	**Unlikely** Suitable habitat was absent.
Hirundapus caudacutus White-throated Needletail	EPBC Act 1999 - M	Inhabits the airspace above forests, woodlands, farmlands, plains, lakes, coasts and towns.	**Low** Due to the non-specific habitat requirements of this species habitat was considered to be present.
Rhipidura rufifrons Rufous Fantail	EPBC Act 1999 - M	Utilises a range of habitats including rainforests, wet sclerophyll forests, monsoon forests, scrubs, mangroves, watercourses, parks and gardens. During migration this species also utilises farms, street trees and buildings.	**Low** Transitory habitat was present.
Pandion haliaetus Osprey	EPBC Act 1999 - M	Inhabits coastal areas, particularly around large river mouths, lagoons and lakes. Feeds on fish over open waters.	**Unlikely** Suitable habitat was absent.
Tringa nebularia Common Greenshank	EPBC Act 1999 - M	Inhabits a wide variety of inland permanent and temporary wetlands and sheltered coastal habitats of varying salinity.	**Unlikely** Suitable habitat was absent.
Dasyurus maculatus ssp. *maculatus* Spotted-tailed Quoll	BC Act 2016 – V EPBC Act 1999 – V	Inhabits sclerophyll forests, rainforests and coastal woodlands. Nests are made in rock caves and hollow logs or trees, and basking sites are usually found nearby.	**Unlikely** Suitable habitat was absent.
Phascolarctos cinereus Koala	BC Act 2016 – V EPBC Act 1999 - V	Coastal woodland and open forest containing suitable food trees.	**Unlikely** Suitable habitat was absent.
Petrogale penicillata Brush-tailed Rock-wallaby	BC Act 2016 – E EPBC Act 1999 – V	Found in steep rocky sites in sclerophyll forests with a grassy understorey.	**Unlikely** Suitable habitat was absent.
Petaurus norfolcensis Squirrel Glider	BC Act 2016 – V	Dry sclerophyll forests and woodlands with exudates for foraging and hollows for nesting.	**Unlikely** Suitable habitat was absent.
Petauroides volans Greater Glider	EPBC Act 1999 – V	Eucalypt-dominated low open forests on the coast to tall forests in the ranges and low woodland west of Great Dividing Range. Not found within rainforests.	**Unlikely** Suitable habitat was absent.
Psuedomys novaehollandiae	EPBC Act 1999 – V	Known to inhabit open heathlands, open woodlands with a heathland understorey and vegetated sand dunes.	**Unlikely** No suitable habitat was present

SPECIES	STATUS	HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
New Holland Mouse			for this species.
Pteropus poliocephalus Grey-headed Flying-Fox	BC Act 2016 – V EPBC Act 1999 – V	Wet and Dry Sclerophyll Forests, Rainforest, Mangroves and Paperbark swamps and Banksia Woodlands.	**Moderate** Seasonal foraging habitat was available in the form of flowering Broad-leaved Paperbark.
Mormopterus norfolkensis Eastern Freetail-bat	BC Act 2016 – V	Appears to live in sclerophyll forests and woodland. Roosts in tree hollows or under loose bark.	**Low** Suitable hunting was available.
Miniopterus australis Little Bentwing-bat	BC Act 2016 – V	Tropical rainforest to warm-temperate wet and dry sclerophyll forest; caves or similar structures for roosting.	**Low** Suitable hunting habitat was present. Preferred roosting habitat was absent.
Miniopterus orianae oceanensis Large Bentwing-bat	BC Act 2016 – V	Wet and dry tall open forest, rainforest, monsoon forest, open woodland, paperbark forests and open grasslands, caves or similar structures for roosting. It occasionally uses tree hollows.	**Low** Suitable foraging habitat was present. Preferred roosting habitat in the form of caves was absent.
Myotis macropus Southern Myotis	BC Act 2016 – V	Various habitats of the coast and adjacent ranges with suitable waterbodies for hunting; caves or similar structures for roosting. It occasionally uses tree hollows.	**Unlikely** Suitable habitat was absent.
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	BC Act 2016 – V	Has been reported from a wide variety of habitats. Roosts in tree hollows, animal burrows, dry clay cracks, under rock slabs and in abandoned Sugar Glider nests.	**Low** Suitable foraging habitat was present.
Scoteanax rueppellii Greater Broad-nosed Bat	BC Act 2016 – V	Tree-lined creeks, woodland/clearing ecotones and rainforest creeks, roosting mainly in tree hollows.	**Low** Suitable foraging was available.
Vespadelus troughtoni Eastern Cave Bat	BC Act 2016 – V	The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT. A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals.	**Unlikely** Suitable habitat was absent.
Chalinolobus dwyeri Large Pied Bat	BC Act 2016 – V EPBC Act 1999 – V	Occupies dry sclerophyll forest and woodland. Roosts in caves, abandoned mud-nests of Fairy Martins and mine tunnels.	**Unlikely** Suitable habitat was absent.

5.4 FAUNA APPRASIAL RESULTS

5.4.1 DIURNAL SURVEYS

A small number of fauna species were observed during the field survey, the following list is inclusive of all species recorded within the site during field:

- *Rhipidura leucophrys* (Willy Wagtail);
- *Gymnorhina tibicen* (Australian Magpie);
- *Manorina melanocephala* (Noisy Miner);
- *Oryctolagus cuniculus* (European Rabbit) scats.

Scythrops novaehollandiae (Channel-billed Cuckoo) and *Grallina cyanoleuca* (Magpie Lark) were also heard calling in the near distance from the Subject Land. None of these species are listed as threatened under State or National legislation. European Rabbit is listed as a Key Threatening Process and is addressed further in Section 7.0 of this report.

5.5 SURVEY LIMITATIONS

As with all reports of this type the main survey limitation is considered to be the very short period of time in which the fieldwork was carried out. Limitations to the likelihood of detecting certain subject species were also encountered during this survey. Such limitations were generally related to the seasonal occurrence of species, be it as a result of known flowering periods for flora or migratory movements by fauna.

These limitations have been overcome by applying the precautionary principle in all cases where the survey methodology may have given a false negative result. This precautionary principle was achieved by recognising that most threatened species are rare and therefore unlikely to be encountered during a survey even if they may utilise the site at other times. These species have been assessed on the basis of the presence of their habitat and the likely significance of that habitat to a viable local population.

6.0 IMPACT ASSESSMENT

The following sections provide an analysis of the potential impact the proposal may have on the biodiversity values within the site and provide recommendations of compensatory and ameliorative measures that should be undertaken.

6.1 AVOIDANCE AND MINIMISATION OF IMPACTS

The proposal has been positioned in an area where minimal native vegetation is present and is already a highly utilised and disturbed location.

6.2 DIRECT IMPACT

The proposal will result in the following direct and potential impacts/losses:

The proposal will result in the following direct and potential impacts/losses:

- Removal of 17 trees, including 3 large specimens of *Melaleuca quinquenervia* (Broad-leaved Paperbark) and 5 specimens of *Casuarina cunninghamiana* (River She-Oak).
- Removal of other vegetation (the majority of the vegetation was composed of introduced species including priority weeds).

6.3 INDIRECT IMPACTS

The proposal may result in the following indirect and potential impacts:

- Erosion and sedimentation;
- Increased spread of noxious and other weeds;
- Edge effects.

6.4 MITIGATION MEASURES

A number of mitigation measures have been specified to minimise the impact of the loss of habitat. The measures will include:

- Prior to tree removal, all trees are to be inspected for habitat features such as bird nests (particularly during spring and early summer);
- Protection of habitat/vegetation outside impact area. Impact area should be clearly defined on the ground;
- Erosion Control;
- Control and appropriate deposal of Priority and other weed propagules within the subject site to prevent further spread to surrounding areas and deposal sites. (It must be noted that weed species are also common outside the impact area).

7.0 CONSIDERATIONS UNDER SECTION 7.3 OF THE BC ACT 2016

Considerations of the effects of the vegetation removal undertaken for the proposed development under *Section 7.3* of the BC Act (2016) for the concerned threatened species is given below. The species dealt with are those identified during the fieldwork and those identified as having potential habitat available on site in Table 4.3.

For the purposes of the Section 7.3 of the BC Act (2016), the following factors have been taken into account in deciding whether there is likely to be a significant effect on this threatened species, populations or ecological communities, or their habitats:

a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

Threatened Flora

No threatened flora species were recorded within the survey area during fieldwork. As a result of the highly disturbed nature of the site and residential location it is considered unlikely that the proposed development would significantly affect the life cycle of any of these flora species or place any viable local populations of these species at risk of extinction.

Threatened Fauna

No threatened fauna species were recorded within the survey area during fieldwork. Of the 82 addressed threatened fauna species the subject site was considered to contain marginal suitable habitat for 13 species:

- *Glossopsitta pusilla* Little Lorikeet
- *Neophema pulchella* Turquoise Parrot
- *Artamus cyanopterus cyanopterus* Dusky Woodswallow
- *Daphoenositta chrysoptera* Varied Sittella
- *Falco subniger* Black Falcon
- *Hamirostra melanosternon* Black-breasted Buzzard
- *Hieraaetus morphnoides* Little Eagle
- *Pteropus poliocephalus* Grey-headed Flying-Fox
- *Mormopterus norfolkensis* Eastern Freetail-bat
- *Miniopterus australis* Little Bentwing-bat
- *Miniopterus orianae oceanensis* Large Bentwing-bat
- *Saccolaimus flaviventris* Yellow-bellied Sheathtail-bat
- *Scoteanax rueppellii* Greater Broad-nosed Bat

The proposal will result in a small incremental reduction of modified habitat for the above species. The species that would find most use of the habitat within the site would be those highly mobile threatened species such as woodland birds, megachiropteran bats and microchiropteran bats. Given the highly disturbed nature of the site it is unlikely that the proposal will have a significant impact on these threatened fauna species such that a local extinction would occur.

b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

No threatened Ecological Community was identified on site.

c) In relation to the habitat of a threatened species or ecological community:

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

The vegetation removal activities as defined in Section 6.0 have resulted in the following:

- Removal of up to 17 trees, including three specimens of *Melaleuca quinquenervia* (Broad-leaved Paperbark), 5 specimens of *Casuarina cunninghamiana* (River She-Oak), 4 specimens of *Fraxinus angustifolia*, 2 specimens of *Pinus* sp., 1 specimen of *Platanus x acerifolia,* and one specimen each of the priority weeds *Ligustrum lucidum* (Broad-leaf Provet), and *Olea europaea subsp. cuspidata* (African Olive).
- Removal of other vegetation (the majority of the vegetation was composed of introduced species including priority weeds).

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The removal of vegetation for the proposal is unlikely to cause fragmented or isolation to areas of habitat.

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

The proposed development will result in the removal of up to 17 mature trees which will result in the loss of predominantly marginal habitat for those threatened species with potential habitat on site.

Given the location of the site no areas of habitat are likely to become fragmented or isolated as a result of the proposal. No areas of habitat important to the long-term survival of the addressed threatened species or Endangered Communities will be impacted.

d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly).

No areas of outstanding biodiversity value are within the site.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the site have been listed in Table 7.1.

Table 7.1: Key Threatening Processes.

Key Threatening Process	Applicability in regards to the subject site
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or threatened species.
Loss of Hollow-bearing Trees.	No hollow-bearing trees will require removal as a result of the proposal.
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as *Cenchrus clandestinus* (Kikuyu) were recorded within the subject site.
Predation by the *Felis catus* (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Competition and grazing by the feral European rabbit, *Oryctolagus cuniculus*	Evidence of the European rabbit was observed within the subject area. The proposal is unlikely to increase the numbers of this species within the locality.
Infection by Psittacine circoviral (beak and feather) disease affecting endangered psittacine species.	No endangered Psittacine species were seen on site. The proposal is unlikely to increase infection by this disease.
Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*	Specimens of African Olive will be removed as a result of the proposal.
Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)	Noisy miners were recorded within the site. The proposal is unlikely to increase the impacts associated with this species.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	This fungus was not observed within the site.

8.0 CONSIDERATIONS UNDER STATE ENVIRONMENT PLANNING POLICY (KOALA HABITAT PROTECTION) 2021

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

Within the City of Maitland SEPP 2021 applies to land that is not zoned RU1, RU2 or RU3 and has an area of more than one hectare or an area which has together with any adjoining land in the same ownership an area of more than one hectare, whether or not the development application applies to the whole, or only part of the land. The western portion of the Subject Land was zoned R1 General Residential and the remainder of the Subject Land was zoned RE2 Private Recreation under the Maitland Local Environmental Plan 2011. The Subject Land is over 1.00ha therefore SEPP 2021 is addressed further below.

With no approved Koala Plan of Management for this LGA, SEPP 2021 is addressed by considering Clause *11 Development assessment process — no approved koala plan of management for land.*

For the purposes of Clause 11 of the SEPP 2021, the following factors have been taken into account in deciding whether there is likely to be a significant impact on koalas or koala habitat:

11.5 … the council may grant development consent if the applicant provides to the council—
(a) information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application-
(i) does not include any trees belonging to the koala use tree species listed in Schedule 2 for the relevant koala management area, or

One species present on site, *Melaleuca quinquenervia* (Broad-leaved Paperbark) is a koala use tree species in the Central Coast Koala Management Area under Schedule 2 of SEPP 2021. Three specimens of this species were present within the Subject Land.

(ii) is not core koala habitat, or

Core Koala Habitat is defined in SEPP 2021 as
" (a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or

(b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years."

No koalas were identified during site surveys. According to the BioNet Atlas database search (DPIE, 2022a), few records of Koala are present within the Maitland LGA. The closest koala recorded was approximately 1.08km to the southwest of the site in Maitland from 2017. Additionally, all records

are physically isolated from the site due to residential developments, large waterways (Hunter River) or the New England Highway (Figure 8.1). It is therefore unlikely that any koalas associated with these records are able to travel to the site as part of foraging or movements within their home range.

Habitat on site was not considered highly suitable koala habitat due to the isolation of trees on site from other patches of vegetation, the lack of any other native vegetation on site and the location of the subject land within a highly residential locality. Given that there is no suitable koala habitat, no koalas recorded during site visits and no koala records on site within the past 18 years, the site is not considered to constitute Core Koala Habitat. Based on this information, development consent may be given by council.

> *(b) information the council is satisfied demonstrates that the land subject of the development application-*
> *(i) does not include any trees with a diameter at breast height over bark of more than 10 centimetres, or*

All trees surveyed within the site had a BDH above 10cm (see Table 5.2).

> *(ii) includes only horticultural or agricultural plantations.*

While the Subject Land is positioned within an established residential area of Maitland, there are remnant trees present in the middle of the site.

Taking all elements into consideration including the lack of habitat and native vegetation, the residential nature of the location and the lack of koala records on site the development is likely to have low or no impact on koalas or koala habitat.

9.0 CONSIDERATIONS UNDER STATE ENVIRONMENTAL PLANNING POLICY (COASTAL MANAGEMENT) 2018

A key aim of the Coastal Management SEPP (CM SEPP) is to promote an integrated and co-ordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the Coastal Management Act 2016, including the management objectives for each coastal management area, by:

- managing development in the coastal zone and protecting the environmental assets of the coast, and
- establishing a framework for land use planning to guide decision-making in the coastal zone, and
- mapping the 4 coastal management areas that comprise the NSW coastal zone for the purpose of the definitions in the Coastal Management Act 2016.

The Coastal Management SEPP identifies four coastal management areas that comprise the coastal zone. These are:

- the coastal wetlands and littoral rainforests area,
- the coastal vulnerability area,
- the coastal environment area, and
- the coastal use area.

The CM SEPP imposes targeted development controls for these areas to guide appropriate development within the coastal zone.

The study area is located within a mapped area of “Coastal Environment Area” and “Coastal Use Area”. Therefore, the development controls for these areas, as listed within Division 3 and 4 respectively of the CM SEPP have been addressed below.

DIVISION 3 COASTAL ENVIRONMENT AREA

Assessment for Development on Land within the Coastal Environment Area

(1) Development consent must not be granted to development on land that is within the coastal environment area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following:

- *the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,*
- *the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,*
- *marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,*
- *existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,*
- *Aboriginal cultural heritage, practices and places; and*
- *the use of the surf zone.*

(2) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that:

- the development is designed, sited and will be managed to avoid an adverse impact referred to in subclause (1), or
- if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or
- if that impact cannot be minimised—the development will be managed to mitigate that impact.

(3) This clause does not apply to land within the Foreshores and Waterways Area within the meaning of Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.

DIVISION 4 COASTAL USE AREA

Assessment for Development on Land within the Coastal Use Area

(1) Development consent must not be granted to development on land that is within the coastal use area unless the consent authority—

(a) has considered whether the proposed development is likely to cause an adverse impact on the following—

- *existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,*

- *overshadowing, wind funnelling and the loss of views from public places to foreshores,*
- *the visual amenity and scenic qualities of the coast, including coastal headlands,*
- *Aboriginal cultural heritage, practices and places,*
- *cultural and built environment heritage, and*

(b) is satisfied that—

- *the development is designed, sited and will be managed to avoid an adverse impact referred to in paragraph (a), or*
- *if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*
- *if that impact cannot be minimised—the development will be managed to mitigate that impact, and*
- *(c) has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development.*

(2) This clause does not apply to land within the Foreshores and Waterways Area within the meaning of Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.

The potential impacts of the proposed development are primarily restricted to the removal of coastal vegetation consisting of 17 canopy trees, planted gardens and disturbed groundcover. Methods of avoidance and minimisation have been detailed within this report. Given the highly disturbed nature of the Subject Land, metropolitan location and mitigation methods detailed within this report, impacts to coastal vegetation are expected to be of an incremental nature.

10.0 ASSESSMENT OF SERIOUS AND IRREVERSIBLE IMPACTS

Under the BC Act 2016, a determination of whether an impact is serious and irreversible (SAII) must be made in accordance with the principles prescribed in section 6.7 of the BC Regulation. The "*Guidance to assist a decision maker to determine a serious and irreversible impact*, 2017, sets out those potential SAII species and ecological communities (known as "potential SAII entities"). The principles for determining serious and irreversible impacts in the Biodiversity Conservation Regulation, 2017 are:

- *will cause a further decline of a species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or*
- *will further reduce the population of a species or ecological community that is currently observed, estimated, inferred, or reasonably suspected to have a very small population size, or*
- *are impacts on the habitat of a species or area of ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographic distribution, or*
- *are impacts on a species or ecological community is unlikely to respond to measures to improve habitat and vegetation integrity and is therefore irreplaceable.*

10.1 POTENTIAL SAII ENTITIES

In this case all potential SAII entities are derived from Appendix 2 of the Guide, and are within the Bionet search area. The approval authority must take those impacts into consideration and determine whether there are any additional and appropriate measures that will minimise those impacts if approval is to be granted. An Impact evaluation is shown in Table 9.1.

Table 9.1: SAII impact evaluation

Potential SAII Entities	Impact Evaluation	Impact Thresholds	Serious and Irreversible Impact?
Anthochaera phrygia Regent Honeyeater	Seasonal foraging habitat was present.	Not within a mapped BAM Important Area (DPIE, 2022)	No
Lathamus discolor Swift Parrot	Suitable foraging was present.	Not within a mapped BAM Important Area (DPIE, 2022)	No
Miniopterus australis Little Bentwing-bat	Suitable foraging habitat was present. Roosting habitat was absent.		No
Chalinolobus dwyeri Large Pied Bat	Suitable foraging habitat was present. Preferred roosting habitat was absent		No

Whilst the subject site contains suitable habitat for a number of the listed SAII species none of these species were recorded within the subject site or within close proximity.

11.0 CONSIDERATIONS UNDER THE COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

Considerations have been made to the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999. Assessments have been made to determine whether or not the proposal or activity has, will have, or is likely to have a significant impact on a matter of National Environmental Significance. The matters of National Environmental Significance and the appropriate responses are listed below:

- *World Heritage properties;*

The site is not likely to have a significant impact to any World Heritage Properties.

- *wetlands recognised under the Ramsar convention as having international significance;*

Although the subject land is within 10km of the Hunter Estuary Wetlands, the proposal is unlikely to impact on this Ramsar site.

- *listed threatened species and communities;*

The vegetation communities present on site were not consistent with any nationally listed TECs and/or populations.

A total of 45 nationally threatened species were recorded on the DAWE database as occurring or having potential habitat available within 10km of the site (Table 4.3). No nationally threatened species were recorded on site during the survey. Low quality habitat was considered to be available for some highly mobile threatened species such as woodland birds, megachiropteran bats and microchiropteran bats. The action will result in an incremental loss/modification of habitat within the locality for these species. The removal of trees as a result of the proposal will also result in an incremental reduction of seasonal foraging habitat for some birds listed above, as well as the Grey-headed Flying Fox. The proposal will result in an incremental loss of foraging and potential roosting/nesting habitat for these species in the local area, however it is not likely to have a significant impact on any of these species.

- *migratory species protected under international agreements;*

Seventeen nationally listed migratory species were recorded on the DAWE on-line database as occurring or having potential habitat available within 10km of the subject site, these being:

<u>Migratory Terrestrial Species:</u>

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

Migratory Wetland Species:

- *Actitis hypoleucos* (Common Sandpiper)
- *Calidris acuminate* (Sharp-tailed Sandpiper)
- *Calidris ferruginea* (Curlew Sandpiper)
- *Calidris melanotos* (Pectoral Sandpiper)
- *Charadrius leschenaultii* (greater Sand Plover)
- *Gallinago hardwickii* (Latham's Snipe)
- *Numenius madagascariensis* (Eastern Curlew)
- *Pandion haliaetus* (Osprey)
- *Tringa nebularia* (Common Greenshank)

Migratory Marine Birds

- *Apus pacificus* (Fork-tailed Swift)

Considering the relatively small impact on habitat in the locality it is unlikely that these species or any of the listed migratory species would be significantly affected by the proposal.

- *nuclear activities;*

The proposal does not involve any type of nuclear activity.

- *the Commonwealth marine environment;*

The proposal does not involve the modification of the Commonwealth marine environment.

12.0 CONCLUSION

Flora, fauna and habitat studies have been undertaken for a proposed Educational Establishment (All Saints College Maitland, St Peter's Campus) including adaptive reuse of the St Paul's Parish Hall, Multi-Purpose Centre, Signage and Staging at Lot 1 DP 69160, Lot 1 DP 1261532, Lot 1 DP 669283, Lot 2 DP 91268 (No. 20-24) Hunter Street, Horseshoe Bend NSW (the Subject Land).

The Subject Land was situated within an established residential area of Maitland/Horseshoe Bend that was characterised by mature trees and gardens. The site was largely composed of maintained lawns, planted gardens, landscaping, carpark, planted trees and a small number of clumped mature trees. The majority of the site was composed of introduced flora species particularly maintained introduced grasses. Due to the disturbance, vegetation within the subject site was unable to be assigned a Plant Community Type (PCT).

The proposal will result in the following direct and potential impacts/losses:

- Removal of up to 17 trees, including three specimens of *Melaleuca quinquenervia* (Broad-leaved Paperbark), 5 specimens of *Casuarina cunninghamiana* (River She-Oak), 4 specimens of *Fraxinus angustifolia* (Narrow-leaved Ash), 2 specimens of *Pinus* sp., 1 specimen of *Platanus x acerifolia* (London Plane Tree), and one specimen each of the priority weeds *Ligustrum lucidum* (Broad-leaf Privet), and *Olea europaea* subsp. *cuspidata* (African Olive).
- Removal of other vegetation (the majority of the vegetation was composed of introduced species including priority weeds).

No threatened flora or fauna species were recorded within the survey area during fieldwork. No habitat was considered present for any of the addressed threatened flora species. Of the 82 addressed threatened fauna species the subject site was considered to contain marginal suitable habitat for 13 species. The species that would find most use of the habitat within the site would be those highly mobile threatened species such as woodland birds, megachiropteran bats and microchiropteran bats. The proposal will result in a small incremental reduction of modified habitat for the 13 species.

Consideration of the State Environment Planning Policy Koala Habitat Protection 2021 identified that one species present on site, *Melaleuca quinquenervia* (Broad-leaved Paperbark) is a koala use tree species in the Central Coast Koala Management Area under Schedule 2 of SEPP 2021. Three specimens of this species were present within the Subject Land. Taking all elements into consideration including the lack of habitat and native vegetation, the residential nature of the location and the lack of koala records on site the development is likely to have low or no impact on koalas or koala habitat.

Considerations have been made to the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act (1999). Considering the relatively small impact on habitat in the locality it is unlikely that these species or any of the listed migratory species would be significantly affected by the proposal.

No Threatened Ecological Communities, Endangered Populations or species were recorded on the site during fieldwork. As a result of the highly disturbed nature of the site and residential location it is considered unlikely that the proposal would have a significant effect on the life cycle of any of these communities or species such that a local extinction would occur.

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APPENDIX A

TOTAL FLORA LIST

Introduced species are indicated by an asterisk ("*").

The following standard abbreviations are used to indicate subspecific taxa:

subsp.	subspecies
var.-	variety
× -	hybrid between the two indicated species

Threatened Species - NSW Biodiversity Conservation Act 2016 (BC Act)

V	Vulnerable
E1	Endangered
E2	Endangered Population
E4A	Critically Endangered Population

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

V	Vulnerable
E	Endangered
CE	Critically Endangered

Serious and Irreversible Impact SAII

Regional Significance (Hunter Rare Plants Database – Version 1 2003)

L	endemic to Hunter Region
DA	disjunct in the Hunter Region, rare or localized (aggregated)
DB	disjunct in the Hunter Region, widespread and uncommon (broad)
R	rare but extends beyond the Hunter Region
U	everywhere uncommon
N	at northern distributional limit in the Hunter
E	at eastern distributional limit in the Hunter
S	at southern distributional limited in the Hunter
W	at western distributional limited in the Hunter
T	may be threatened in the Hunter Region
S	Probably secure in the Hunter Region

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
CONIFEROPSIDA (Conifers)						
Pinaceae						
**Pinus* sp.						
MAGNOLIOPSIDA: Magnoliidae						
LILOPSIDA: (Monocotyledons)						
Asparagaceae						
Lomandra longifolia	Spiny Mat Rush					Aug, Sept
Cyperaceae						
Cyperus gracilis	Slender Flat-sedge					
Doryanthaceae						
Doryanthes excelsa	Gymea Lily					
Iridaceae						
**Dietes bicolor*	African Iris					
Poaceae						
**Axonopus fissifolius*	Narrow-leaved Carpet Grass					
**Cenchrus clandestinus syn Pennisetum clandestinum*	Kikuyu					
**Chloris gayana*	Rhodes Grass					
Digitaria Sanguinalis	Summer Grass					
**Ehrhartia erecta*	Panic Veldt Grass					
**Paspalum dilatatum*	Paspalum					
Sporobolus creber	Slender Rats Tail					
**Stenotaphrum secundatum*	Buffalo Grass					
**Vulpia bromoides*	Fescue					
MAGNOLIIDAE (Dicotyledons)						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
Apiaceae						
Centella asiatica	Indian Pennywort					
Asteraceae						
**Bidens pilosa*	Cobblers Pegs					
**Cirsium vulgare*	Spear Thistle					Sept
Cotula australis	Carrot Weed					
Euchiton involucratus syn. *Gnaphalium involucratum*	Cudweed					
**Hypochaeris radicata*	Catsear, Flatweed					
**Sonchus oleraceus*	Common Sow Thistle					
**Taraxacum officinale*	Dandelion					
Berberidaceae						
**Nandina domestica*	Nandina					
Casuarinaceae						
Casuarina cunninghamiana	River She-oak					
Cupressaceae						
Cupressus sp.						
Euphorbiaceae						
Euphorbia drummondii	Caustic Weed					
**Ricinus communis*	Castor Oil Plant					
Malvaceae						
**Modiola carliniana*	Red-flowered Mallow					Sept
Meliaceae						
Melia azedarach var. *australasica*	White Cedar					
Myrtaceae						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
Melaleuca quinquenervia	Broad-leaved Paperbark					Feb, Mar
Oleaceae						
**Fraxinus angustifolia*	Narrow-leaved Ash					
**Ligustrum lucidum*	Large-leaved Privet					Jan, Feb
**Olea europaea* subsp. *cuspidata*	African Olive					
Platanaceae						
**Platanus xhispanica*	London Plane Tree					
Phytolaccaceae						
**Phytolacca octandra*	Inkweed					
Plantaginaceae						
**Plantago lanceolata*	Plantain					
Portulacaceae						
Portulaca oleracea	Purslane, Pigweed					
Primulaceae						
**Lysimachia arvensis* syn. *Anagallis arvensis*	Scarlet Pimpernel					
Rosaceae						
**Photinia serratifolia*	Photinia					
Pomax umbellata	Pomax					
Solanaceae						
**Cestrum parqui*	Green Cestrum					Sept, Oct