Ecological Assessment

for a
Proposed Residential Subdivision
at
176 Wollombi Road,
Farley, NSW 2320

Prepared by:

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Site Details:	176 Wollombi Rd, Farley, NSW 2320
Prepared by:	***Sarah Jones B.Env.Sc., G.Dip.DBPA (Design in Bushfire Prone Areas)*** ***Firebird ecoSultants Pty Ltd*** **A**BN – 16 105 985 993 PO Box 354, Newcastle NSW 2300 M: 0414 465 990 Email: sarah@firebirdeco.com.au T: 02 4910 3939 Fax: 02 4929 2727
Prepared for:	**The Bathla Group**
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Executive Summary

Introduction

Firebird ecoSultants Pty Ltd has been engaged by The Bathla Group to provide an ecological assessment for a proposed residential subdivision ('the proposal') at 176 Wollombi Rd, Farley 2320. Lot 23 DP701849 ("the Site").

This assessment aims to recognise the relevant requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act), *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

A literature review and desktop research was combined with flora and fauna surveys, and a habitat assessment. Commonwealth, state and local government policies and guidelines formed the basis of project surveying and assessment methodology.

Flora

A few scattered paddock trees, *Corymbia maculta* (Spotted gum trees) & *Eucalyptus punctata (Grey gum),* occur within the site which are potentially a remnant of a form of Lower Hunter Spotted Gum - Ironbark Forest (listed as an endangered ecological community under the BC Act). The vegetation within the site however has been highly modified from its original form, with a cleared and heavily grazed understorey which is almost entirely made up of exotic pasture grasses. The Lower Hunter Native Vegetation mapping has not indicated any vegetation communities at the site while the Keith Class Vegetation Mapping reports the Hunter-Macleay Dry Sclerophyll Forest community type.

It is therefore considered that the vegetation within the site has been modified to an extent that it would no longer be representative of a form of Lower Hunter Spotted Gum - Ironbark Forest (listed as an endangered ecological community under the BC Act).

Fauna

The site may provide marginal habitat for potentially occurring threatened species that are adapted to open areas, such as woodland birds and microbats. No fauna was spotted during surveys.

Impact Assessment

The proposal would require the removal of vegetation within the entire site, which is approximately 2.09 ha of exotic grassland with scattered paddock trees and landscaped gardens.

One (1) hollow bearing tree will be removed by the proposed development which would be suitable for a range of species including small birds and mammals, and microbats. Habitat trees identified for removal shall have their hollow sections salvaged; alternatively, artificial nest boxes will be erected off site in a patch of forest located approximately 100m to the site's north, at a replacement ratio of 1:1.

Due to the historic clearing and current land use within the site and immediate area, the proposal would not impact connectivity.

Potential direct impacts to flora and fauna include:

- Removal of a few native scattered paddock trees, one of which contains hollows;
- Risk of runoff, erosion and sedimentation, during construction;
- Some minor loss of marginal habitat suited for species adapted to open areas;
- Temporary disturbance to fauna during construction work

Potential indirect impacts to flora and fauna include:

- Long and short-term edge effects resulting from the clearing of vegetation (e.g. changes in light filtration, cumulative effect leading to extinction);
- Operational phase impacts on downstream water quality, from overflow events.

Section 5.2 outlines proposed mitigation measures. If these are adhered to, it is considered unlikely that the proposal would significantly impact any threatened species, populations or EECs. Overall, considering the highly modified state of the site, the proposal is not expected to have any significant impacts on native biodiversity.

Conclusion

Assessments of Significance under the BC Act (five-part tests) and Significant Impact Assessments under the EPBC Act have acknowledged that the proposal has the potential to impact on a number of threatened species. This impact however is not significant and, provided that the recommendations (below) are adhered to, is unlikely to place any viable local populations / communities at risk of extinction. Furthermore, it is concluded that a BDAR is not required as the site is not listed on the Biodiversity Values Map, nor does it meet the BOS vegetation removal thresholds being 0.2 ha. It was also determined that there would be no significant effect on threatened species, populations or ecological communities – this too determines that a BDAR is not required. It is also concluded that an EPBC Act Referral and approval of DEE is not required. Finally, the provisions of Koala Habitat Protection SEPP have also been considered and it is concluded that the site does not constitute 'Potential Koala Habitat'; no further provisions of Koala Habitat Protection SEPP apply.

Recommendations

The following recommendations should be conditioned as part of any development consent;

The following measures of avoidance have been or are required to be undertaken:

- One (1) hollow bearing tree will be removed by the proposed development which would be suitable for a range of species including small birds and mammals, and microbats. The following is recommended in relation to the removal of these trees:

  - Habitat trees identified for removal shall have their hollow sections salvaged; alternatively, artificial nest boxes will be erected at a replacement ratio of 1:1. The number and size of replacement nest boxes will be determined following clearing, where an ecologist can adequately assess the hollows on the ground.

  - Habitat trees identified for removal are to have their hollows inspected by a suitably qualified Ecologist and Fauna Handler immediately prior to clearing, to determine if the hollows are being utilised by fauna. Any fauna located are to be trapped and relocated to adjoining areas not subject to development pressure prior to the tree being felled.

  - Hydrological and sediment/erosion controls must be implemented where necessary to maintain the quality and quantity of pre-development water flows into downstream areas.

Terms & Abbreviations

Abbreviation	Meaning
API	Aerial Photograph Interpretation
BC Act	*Biodiversity Conservation Act 2016*
DCP	Development Control Plan
APZ	Asset Protection Zone
DEE	Department of Environment and Energy
DPE	Department of Planning and Environment
EEC	Endangered Ecological Community
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
Ha	Hectare
LHCCREMS	Lower Hunter and Central Coast Regional Environment Management Strategy
LEP	Local Environmental Plan
MC	Maitland Council
NPWS	National Parks and Wildlife Service
OEH	Office of Environment and Heritage
ROTAP	Rare or threatened Australian Plants
TEC	Threatened Ecological Community

CONTENTS

TABLES

FIGURES

1 INTRODUCTION

1.1 Background

Firebird ecoSultants Pty Ltd has been engaged by The Bathla Group to provide an ecological assessment for a proposed residential subdivision ('the proposal') 176 Wollombi Road, Farley, NSW 2320 Lot 23 DP701849 ('the site').

This assessment aims to recognise the relevant requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act), *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

A literature review and desktop research was combined with flora and fauna surveys, and a habitat assessment. Commonwealth, state and local government policies and guidelines formed the basis of project surveying and assessment methodology.

1.2 Site Particulars

Locality:	176 Wollombi Road, Farley, NSW 2320
LGA:	Maitland
Lot / DP:	Lot 23 DP701849
IBRA Region	Sydney Basin
IBRA Subregion	Hunter
Mitchell Landscape	Newcastle Coastal Ramp
Land size:	~2.09 ha
Zoning:	R1 – General Residential
Current Land Use:	Grazing, homestead/garden and some remnant native vegetation

1.3 Site Description

The site is zoned as both R1 – General Residential under the Maitland Local Environment Plan (LEP) 2011 and is approximately 2.09 ha in size. It is predominately cleared with a heavily grazed understorey and scattered native and exotic canopy trees and a few shrubs. To the east, the site is predominately surrounded by managed rural land with grazing cattle. To the north, there is a trainline <70m from the lot boundary. New subdivisions are being built to the west where land clearing has already occurred. No streams or dams occur onsite. Some larger parcels of vegetation occur several kilometres to the south-west as well as to the south-east.

See Figure 1-1 for the site locality.

1.4 Description of the Proposal

The proposal includes a 27-lot residential subdivision within which a road network will be constructed. It is estimated that several medium-large endemics as well as exotic trees (scattered paddock trees), weeds (mainly exotic grasses) and occasional shrubs would be removed for the proposed access roads, building envelopes, driveway. See Appendix A for the site plans.

1.5 Purpose and Scope of Study

The scope of this ecological assessment report is to:

- Identify vascular flora species on the site;
- Identify and map existing vegetation communities;
- Identify fauna species for the site through desk-top analysis, assuming presence for some marginal species. Any sightings observed at the site were also noted.
- Identify existing habitat types on the site and assess the habitat potential for threatened species / populations, or endangered ecological communities (EECs) known from the proximate area;
- Assess the status of identified or potentially occurring flora species, vegetation communities and fauna species under relevant legislation;
- Assess the potential impacts of the proposal on threatened species / populations or EECs, or their habitats;
- Identify the biodiversity values and constraints on the site; and
- Provide recommendations to ensure that the recorded biodiversity values on the site are adequately managed and/or protected.

Whilst survey work has been undertaken wholly within the bounds of the site, consideration has been afforded to areas off the site in order to appreciate the environmental context of the site.

The purpose of this report is to:

- Ensure planning, management and development decisions are based on sound scientific information and advice by documenting the presence of any biodiversity components or potential significant impacts that may exist on the site;
- Provide information to enable compliance with applicable assessment requirements contained within the EP&A Act, BC Act, EPBC Act and any other relevant state, regional and local environmental planning instruments; and
- Enable the provision and analysis of ecological data that is comparable with data for other sites within the region to ensure continuity and consistency for survey and results.

1.6 Qualifications and Licensing

Qualifications

Fieldwork for this project was undertaken by Ollie Broun & Stephanie Sheehy. Report writing was undertaken by Sarah Jones & Stephanie Sheehy. Qualifications are provided in Appendix B.

Licensing

Research was conducted under the following licences:

- NSW National Parks and Wildlife Service Scientific Investigation Licence SL100533;
- Animal Research Authority (Trim File No: TRIM 11/5655) issued by NSW Department of Primary Industries; and
- Animal Care and Ethics Committee Certificate of Approval (Trim File No: TRIM 11/5655) issued by Department of Primary Industries.

Certification

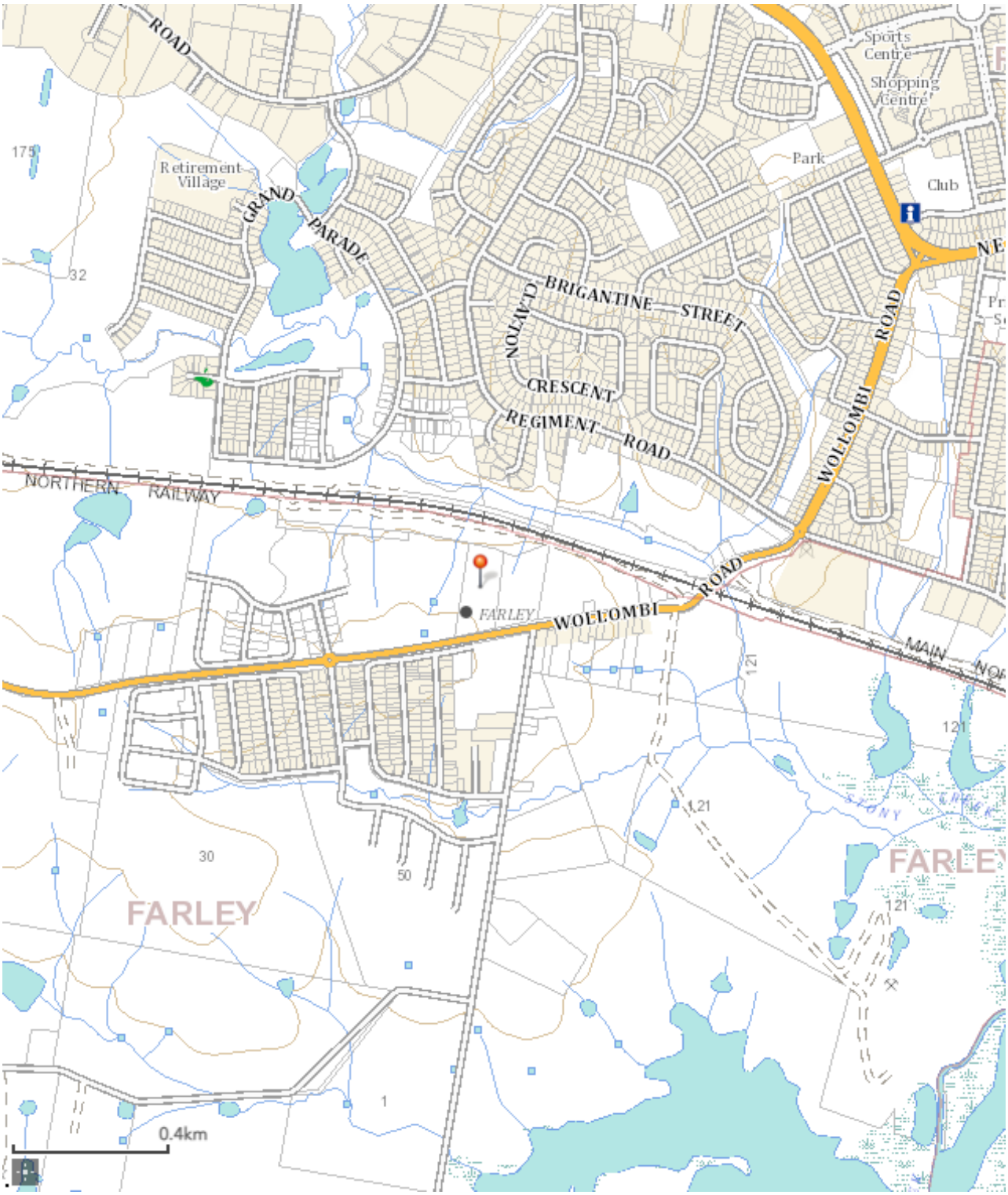
As the principal author, I, Sarah Jones, make the following certification:

- The results presented in the report are, in the opinion of the principal author and certifier, a true and accurate account of the species recorded, or considered likely to occur within the site;
- Commonwealth, state and local government policies and guidelines formed the basis of project surveying methodology, or where the survey work has been undertaken with specified departures from industry standard guidelines, details of which are discussed and justified in Section 2;
- All research workers have complied with relevant laws and codes relating to the conduct of flora and fauna research, including the *Animal Research Act 1995, National Parks and Wildlife Act 1974* and the *Australian Code of Practice for the Care and Use of Animals for Scientific Purposes*.

Signature of Principal Author and Certifier:

Sarah Jones
Ecologist / Bushfire Planner
FPA BPAD-A Certified Practitioner (BPD-PA-26512)
B.Env.Sc. G.Dip.DBPA (Design for Bushfire Prone Areas)

Figure 1-1: Site Location



2 METHODOLOGY

This assessment included a desktop-based analysis of previous records of threatened species in the area, a review of any relevant literature and field-based surveys of the site and surrounding area. Where possible, survey methods have been designed in accordance with the relevant survey and assessment guidelines.

2.1 Desktop Research

2.1.1 Database Searches

The following database searches were undertaken, in order to compile a list of threatened flora and fauna species and Matters of National Environmental Significance (MNES), predicted to occur in the area:

Review of threatened fauna and flora records within a 10 km radius of the site, contained in the OEH Atlas of NSW Wildlife (NSW BioNet).

Review of the Matters of National Environmental Significance (MNES) records within a 10 km radius of the site, using the Commonwealth Department of Environment and Energy (DEE), EPBC Act Protected Matters Search Tool.

2.1.2 Literature Review

Information sources reviewed included, but were not limited to:

- Aerial Photograph Interpretation (API);
- Relevant ecological survey guidelines, including:
  - LHCCREMS Flora and Fauna Survey Guidelines, Lower Hunter Central Coast Region 2002, Volume 1 & Volume 2 (Murray et al. 2002);
  - OEH *Threatened species assessment guidelines: The assessment of significance* (Department of Environment and Climate Change (DECC, 2007)
  - OEH *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* (Department of Environment and Conservation (DEC) 2004) and *NSW Guide to Surveying Threatened Plants* (OEH 2016)
- Environmental / planning reports relevant to the site / area, including:
  - *Maitland Local Environment Plan* (LEP) *2011*
  - *Hunter Regional Plan 2036* (Department of Planning & Environment)
  - *Maitland Development Control Plan* (DCP) *2011*
- Any relevant recovery plans.
- OEH Threatened Species, Populations and Ecological Communities website <http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/>; and

- Collective knowledge gained from previous ecological assessments in the local area.

2.2 Flora Survey and Vegetation Mapping

A flora survey was conducted on 22nd August 2022. This included, a survey using Cropper's (1993) random meander technique, to record flora species and to determine the boundaries of any vegetation communities as well as a "Grasslands and other Groundcover Assessment (and Certificate) for the site.

Isolated paddock trees were mapped into definable map units. This included an assessment of the potential for exotic vegetation communities to constitute an EEC, listed under the BC Act and EPBC Act.

Finally, opportunistic searches for threatened / significant flora species were undertaken on the site (however largely this search was undertaken via a desktop survey). A list of potentially occurring significant flora species from the locality (10 km radius) was compiled (see Section 2.1); these included threatened species listed under the BC Act, EPBC Act, Rare or Threatened Australian Plants (ROTAP) (Briggs and Leigh 1996), as well as any other species deemed to be of local importance. Targeted searches were then undertaken over the site, whereby the entire site was systematically traversed.

2.3 Habitat Assessment

An assessment of the relative habitat values of the site was undertaken on the site. A tree hollow assessment was the main habitat feature identifiable. The habitat assessment focused on the identification of habitat types and resources favoured by all major guilds of native flora and fauna, including threatened species known from the region. The assessment was based on specific habitat requirements in regards to home range, feeding, roosting, breeding, movement patterns and corridor requirements. Consideration was given to contributing factors including topography, soil, light and hydrology.

2.4 Survey Limitations

The field survey was undertaken on 22nd August 2022. Given the relatively small area of vegetation to be removed (which can only be referred to as isolated paddock trees and a strip along the front fence [both native and exotic] and some scattered shrubs) as well as the site's lack of connectivity to broader tracts of vegetation, no nocturnal surveys were undertaken. Nonetheless, in order to address any potential limitations which are inherent in ecological surveys due to seasonal and weather restrictions, the habitat assessment and the presence of local records for threatened species were used to assess whether threatened species were likely to be present. Furthermore, where necessary the precautionary principle of 'assumed presence' has been applied.

The survey methods undertaken are unlikely to detect all of the species present within the study area or have potential to occur within the study area due to seasonal and temporal conditions.

3 RESULTS

3.1 Desktop Research

3.1.1 Database Searches

A number of threatened species and EECs have been recorded on the Atlas of NSW Wildlife database and EPBC Act Protected Matters Search Tool, within a 10 km radius of the site. These are listed in Table 3-1. Note that marine species have been excluded, as they would not be relevant to the site. See Appendix C for the full EPBC Protected Matters report.

Table 3-1: Threatened Species and TECs Identified Within a 10 km Radius of the Site by a Search of the NSW Atlas of Wildlife and the EPBC Act Protected Matters Search Tool

Scientific Name	Common Name	BC Act	EPBC Act
Threatened Flora			
Acacia bynoeana	Bynoe's Wattle	E	V
Arthraxon hispidus	Hairy Jointgrass	V	V
Caladenia tessellata	Thick Lip Spider Orchid	E	V
Callistemon linearifolius	Netted Bottle Brush	V	Not Listed
Cryptostylis hunteriana	Leafless Tongue Orchid	V	V
Cymbidium canaliculatum	Tiger Orchid	Not Listed	Not Listed
Cynanchum elegans	White-flowered Wax Plant	E	E
Dichanthium setosum	Bluegrass	V	V
Eucalyptus camaldulensis	River Red Gum	Not Listed	Not Listed
Eucalyptus glaucina	Slaty Red Gum	V	V
Eucalyptus parramattensis subsp. decadens		V	V
Euphrasia arguta		C E	C E
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	V	V
Persicaria elatior	Tall Knotweed	V	V

Scientific Name	Common Name	BC Act	EPBC Act
Persoonia hirsuta	Hairy Geebung	E	E
Persoonia pauciflora	North Rothbury Persoonia	C E	C E
Pomaderris brunnea	Brown Pomaderris	E	V
Prostanthera cineolifera	Singleton Mint Bush	V	V
Pterostylis gibbosa	Illawarra Greenhood	E	E
Rhizanthella slateri	Eastern Australian Underground Orchid	V	E
Rhodamnia rubescens	Scrub Turpentine	C E	Not Listed
Rhodomyrtus psidioides	Native Guava	C E	Not Listed
Rutidosis heterogama	Heath Wrinklewort	V	V
Syzygium paniculatum	Magenta Lilly Pilly	E	V
Tetratheca juncea	Black-eyed Susan	V	V
Thesium australe	Austral Toadflax	V	V
Threatened Birds			
Anseranas semipalmata	Magpie Goose	V	Not Listed
Anthochaera phrygia	Regent Honeyeater	CE	C E
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	Not Listed
Botaurus poiciloptilus	Australasian Bittern	E	E
Calidris ferruginea	Curlew Sandpiper	E	C E
Callocephalon fimbriatum	Gang-gang Cockatoo	V	Not Listed
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	Not Listed
Charadrius leschenaultii	Greater Sand-plover	V	V
Chthonicola sagittata	Speckled Warbler	V	Not Listed
Daphoenositta chrysoptera	Varied Sittella	V	Not Listed
Ephippiorhynchus asiaticus	Black-necked Stork	E	Not Listed
Erythrotriorchis radiatus	Red Goshawk	CE	V

Scientific Name	Common Name	BC Act	EPBC Act
Falco hypoleucos	Grey Falcon	E	Not Listed
Glossopsitta pusilla	Little Lorikeet	V	Not Listed
Grantiella picta	Painted Honeyeater	V	V
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	Not Listed
Hirundapus caudacutus	White-throated Needletail	Not Listed	Not Listed
Lathamus discolor	Swift Parrot	E	CE
Limosa lapponica baueri	Bar-tailed Godwit (baueri)	Not Listed	V
Ninox connivens	Barking Owl	V	Not Listed
Numenius madagascariensis	Eastern Curlew	Not Listed	C E
Oxyura australis	Blue-billed Duck	V	Not Listed
Petroica boodang	Scarlet Robin	V	Not Listed
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V	Not Listed
Pycnoptilus floccosus	Pilotbird	Not Listed	Not Listed
Rostratula australis	Australian Painted Snipe	E	E
Sternula albifrons	Little Tern	E	Not Listed
Tyto novaehollandiae	Masked Owl	V	Not Listed
Threatened Mammals			
Chalinolobus dwyeri	Large-eared Pied Bat	V	V
Dasyurus maculatus	Spotted-tailed Quoll	V	E
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	Not Listed
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	Not Listed
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	Not Listed

Scientific Name	Common Name	BC Act	EPBC Act
Myotis macropus	Southern Myotis	V	Not Listed
Petauroides volans	Greater Glider	Not Listed	V
Petaurus australis	Yellow-bellied Glider	V	Not Listed
Petaurus norfolcensis	Squirrel Glider	V	Not Listed
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V
Phascogale tapoatafa	Brush-tailed Phascogale	V	Not Listed
Phascolarctos cinereus	Koala	V	V
Potorous tridactylus	Long-nosed Potoroo	V	V
Pseudomys novaehollandiae	New Holland Mouse	Not Listed	V
Pteropus poliocephalus	Grey-headed Flying-fox	V	V
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	Not Listed
Scoteanax rueppellii	Greater Broad-nosed Bat	V	Not Listed
Vespadelus troughtoni	Eastern Cave Bat	V	Not Listed
Threatened Hepetofauna			
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	E	V
Delma impar	Striped Legless Lizard	V	V
Ecological Communities			
Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions (E, CE*)		E	CE
Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions (E, CE*)		E	CE
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (E, V*)		E	V

Scientific Name	Common Name	BC Act	EPBC Act
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (E)		E	-
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions (E)		E	-
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions (E)		E	-
Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion (V, CE*)		V	CE
Lower Hunter Spotted Gum-Ironbark Forest in the Sydney Basin Bioregion (E)		E	-
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (E)		E	-
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (E)		E	-
Other			
Hunter Estuary Wetland		-	Wetland of International Importance (Ramsar)

Status: V: Vulnerable, E: Endangered, CE: Critically Endangered, M: Migratory

Flora Survey and Vegetation Mapping

In the past the site was likely a form of Lower Hunter Spotted Gum - Ironbark Forest (listed as an endangered ecological community under the BC Act). However, the site and surrounding area contains only a handful of remnant *Corymbia maculata* (Spotted Gum), there are also a few *Eucalyptus robusta* (Swamp Mahogany), and *Eucalyptus punctata (Grey Gum).* The vegetation has been highly modified from its original form, with a cleared and heavily grazed understorey. The Lower Hunter Native Vegetation mapping has not indicated any vegetation communities at the site while the Keith Class Vegetation Mapping reports the Hunter-Macleay Dry Sclerophyll Forest community type.

Figure 3-1 provides a distribution map of the site's vegetation communities and Appendix D provides a full list of recorded species. Appendix E is the preliminary arborist report stating tree health and location. The dominant floristic characteristics of the vegetation community are described below. Photographs of the vegetation and habitat values of the site are also shown below.

3.1.2 Exotic Grassland with Scattered Paddock Trees

The vegetation within the site however has been highly modified from its original form, with a cleared and heavily grazed understorey which is almost entirely made up of exotic pasture grasses and planted gardens containing both native and exotic vegetation. The Lower Hunter Native Vegetation mapping has not indicated any vegetation communities at the site while the Keith Class Vegetation Mapping reports the Hunter-Macleay Dry Sclerophyll Forest community type.

It is therefore considered that the vegetation within the site has been modified to an extent that it would no longer be representative of a form of Lower Hunter Spotted Gum - Ironbark Forest (listed as an endangered ecological community under the BC Act).

3.1.3 Vegetation Integrity

The site's exotic grassland can be best described as scattered paddock trees, dominated by exotic pasture grasses. The vegetation within the site has been highly modified from its original form to an extent that it is no longer considered to be a native vegetation community. Appendix E - preliminary arborist report, states tree health and location.

Photo 1: Scattered paddock trees within the site (looking north toward the dwelling)

3.1.4 Endangered Ecological Communities and Threatened Flora

As discussed above, it is considered that the vegetation within the site has been modified to an extent that it would no longer be representative of a form of Lower Hunter Spotted Gum - Ironbark Forest (listed as an endangered ecological community under the BC Act). Therefore, no endangered ecological communities occur with the site.

No threatened flora species were observed on the site. It is considered that the current grazing pressure on the site would prevent the establishment and persistence of threatened flora species predicted to occur in the area. Thus, it is concluded that they are unlikely to be present.

3.2 Fauna

The site may provide marginal habitat for potentially occurring threatened species that are adapted to open areas, such as woodland birds and microbats. Fauna observed on site included the Australian Magpie (*Gymnorhina tibicen*), Willie Wagtail (*Rhipidura leucophrys*) & the Brown honeyeater (*Lichmera indistincta*).

3.2.1 Threatened Fauna

No threatened fauna species were recorded within the site.

3.3 Habitat Assessment

The following provides a summary of the site's habitat values:

- The site largely lacks an understorey. This would limit habitat availability. The site's few scattered trees however, may provide potential foraging, nesting, resting and roosting habitat for fauna species adapted to open areas.
- One (1) hollow-bearing tree occurs within the site that would be suitable for a range of species including small birds and mammals, and microbats.
- The site is heavily grazed and managed in a 'tidy' condition, with minimal ground timber. This would limit habitat for birds, reptiles, frogs and invertebrates that rely on ground timber for foraging, nesting, resting, perching or basking. However, it is most likely that common snakes and other reptiles do frequent the site.
- The site lacks rocky surfaces, outcrops, caves or ledges.
- The site contains a mixture of suitable foraging habitats for microchiropteran bats (including structurally open/edge habitat).

3.3.1 Corridors and Connectivity

The site's vegetation has very tenuous links to relatively isolated patches of remnant vegetation within the wider locality, these patches on their own do not connect to conserved estate, much of the local area is considered for future residential living.

The site may form part of a network of 'stepping stones' throughout the area for fauna species that are able to traverse open areas. The site itself is already predominantly cleared of canopy vegetation and mostly consists of scattered paddock trees and landscaped garden with both planted native and exotic vegetation. The proposal is not expected to impact on existing connectivity within the site.

The site is not located within or near to any green corridor identified in the Hunter Regional Plan 2036 (Department of Planning and Environment, 2016).

Tree No.	Species
1	Corymbia maculata
2	Cinnamomum camphora
3	Eucalyptus pilularis
4	Jacaranda
5	Melaleuca armillaris
6	Eucalyptus punctata
7	Melaleuca armillaris
8	Eucalyptus robusta
9	Eucalyptus punctata
10	Leptospermum petersonii
11	Callistemon viminalis
12	Morus nigra
13	Eucalyptus species
14	Ficus macrophylla
15	Eucalyptus species
16	Callistemon viminalis
17	Callistemon viminalis
18	Melaleuca 'CV'
19	Eucalyptus crebra
20	Unidentified shrub

Note:
Boundaries are not survey accurate.
Although all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

FIGURE 3-1: VEGETATION MAP

Ref No 3151

CLIENT	Client
SITE DETAILS	No.176 Wollombi Road Farley
DATE	8 September 2022

NORTH

0 25 50 75

SCALE 1500 @ A3

PIXELDRAFTING

Firebird ecoSultants Pty Ltd
ABN - 16 105 985 993
Level 1, 146 Hunter Street, Newcastle NSW 2300
P O Box 354 Newcastle NSW 2300

firebird

4 THREATENED SPECIES / COMMUNITIES LIKELIHOOD OF OCCURRENCE ASSESSMENT

Several threatened species and EECs were identified in Section 3 of this report, as potentially occurring in the area. An assessment of the likelihood of occurrence for each of these threatened species and EECs was conducted; see Table 4-1. This assessment deals with the following heads of consideration in tabulated form:

'**Species / Community'** – Lists each threatened species / community known from the vicinity. The status' of each, under the BC Act and EPBC Act, are also provided.

'Habitat Description and Known Populations' – Provides a brief account of the preferred habitat attributes required for the existence / survival of each species / community and information on known populations in the area.

'Likelihood of Occurrence' – Assesses the likelihood of each species / community to occur in or within the immediate vicinity of the study area in terms of the aforementioned habitat description and taking into account local habitat preferences, results of current field investigations, data gained from various sources (such as OEH Atlas of NSW Wildlife, herbariums, etc.) and previously gained knowledge via fieldwork undertaken within other ecological assessments in the locality.

'Potential for Impact'– Assesses the likely level / significance of impacts to each species / community that would result from the proposed development, taking into account direct and indirect short and long-term impacts.

Note: Species highlighted in grey will be assessed under section 7.3 of the BC Act (i.e., five-part test) in section 5 of this report.

Table 4-1: Threatened Species Chance of Occurrence & Potential for Impact

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Threatened Flora			
Acacia bynoeana Bynoe's Wattle (E, V*)	Bynoe's wattle is found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. Occurs in heath or dry sclerophyll forest on sandy soils. The species is currently known from about 30 locations, with the size of the populations at most locations being very small (1-5 plants). It has recently been found in the Colymea and Parma Creek areas west of Nowra. (OEH, 2017a).	**Low** Was not recorded on site It is unlikely to have been overlooked during the survey effort. Not near any known population.	**Low** Unlikely to occur on the site.
Arthraxon hispidus Hairy Jointgrass	A creeping grass over wide-spread South-east Queensland, North coast of NSW and Japan to Eurasia however is actually not common. With 2-6cm long blades, long white hairs edging the leaf and purple in colour stems, this grass is a perennial species that dies down in Winter.	**Low** Was not recorded on site It is unlikely to have been overlooked during the survey effort. Not near any known population.	**Low** Unlikely to occur on site.
Caladenia tessellata Thick Lip Spider Orchid (E,V*)	The Thick Lip Spider Orchid is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. It was also recorded in the Huskisson area in the 1930s. The species occurs on the coast in Victoria from east of Melbourne to almost the NSW border. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. Flowers appear between September and November (but apparently generally late September or early October in extant southern populations).	**Low** Was not recorded on site, no known populations within the nearby area (10x10km search area). Unlikely to occur due to the highly altered and disturbed nature of the site.	**Low** Unlikely to occur on the site.
Callistemon linearifolius Netted Bottle Brush (V)	Recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW. Recorded in 2000 at Coalcliff in the northern Illawarra. For the Sydney area, recent records are limited to the Hornsby Plateau area near the Hawkesbury River. The species was more widespread in the past, and there are currently only 5-6 populations remaining from the 22 populations historically recorded in the Sydney area. Three of the remaining populations are reserved in Ku-ring-gai Chase National Park, Lion Island Nature Reserve and Spectacle Island Nature Reserve. The species has also been recorded from Yengo National Park. Grows in dry sclerophyll forest on the coast and adjacent ranges. (OEH, 2017a).	**Low** Was not recorded on site. It is unlikely to have been overlooked during the survey effort.	**Low** Unlikely to occur on site.
Cryptostylis hunteriana Leafless Tongue Orchid (V, V*)	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. The larger populations typically occur in woodland dominated by Scribbly Gum (Eucalyptus sclerophylla), Silvertop Ash (E. sieberi), Red Bloodwood (Corymbia gummifera) and Black Sheoak (Allocasuarina littoralis); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (C. subulata) and the Tartan Tongue Orchid (C. erecta)	**Low** This species was not recorded onsite. It is unlikely to have been overlooked.	**Low** This species did not occur onsite.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Cymbidium canaliculatum (EP)	In NSW the species is restricted to the north-eastern quarter of the State, occurring chiefly in inland districts west to New Angledool and Walgett on the north western plains and north of the Hunter River, through the north western slopes, northern tablelands and north coast into south-eastern Queensland. A disjunct population of fewer than 500 individuals though estimated to be as low as 90, which occurs in the Hunter Valley at the south-eastern distributional limit of the species' range. The Hunter population is known to occur naturally as far south as Weston and Pokolbin in the Lower Hunter, which represents its south-eastern geographic limit, but appears to be more centred in the Upper Hunter, predominantly north of Singleton. In this area it is chiefly known from an area bounded by Ravensworth, Muswellbrook, Denman and Sandy Hollow, but extends northwards to the Aberdeen – Scone – Wingen districts. Isolated occurrences are also known from the Merriwa plateau, Bylong valley and the Gungal area near Goulburn River (including the Goulburn River National Park). Nevertheless, the population is defined as occurring in the Hunter Catchment, and as such may be present in any of the local government areas of Cessnock, Maitland, Dungog, Singleton, Muswellbrook, Newcastle, Port Stephens, part of Mid-western Regional, and part of Upper Hunter. The vast majority of individuals (>90%) occur on private property, scattered across 30-40 sites, predominantly in the Muswellbrook and Upper Hunter LGAs. Typically grows in the hollows, fissures, trunks and forks of trees in dry sclerophyll forest or woodland, where its host trees typically occur on Permian Sediments of the Hunter Valley floor. It usually occurs singly or as a single clump, which can form large colonies on trees, between two and six metres from the ground (OEH, 2017a).	**Low** Was not recorded on site. The site lacks potential habitat of dry sclerophyll forest or woodland.	**Low** Unlikely to occur on site.
Cynanchum elegans White-flowered Wax Plant (E, E*)	A climber or twiner that can grow up to 10 m high. Occurs on a variety of lithologies and soil types, usually on steep slopes with varying degrees of soil fertility. Recorded from rainforest gullies scrub and scree slopes; from the Gloucester district to the Wollongong area and inland to Mt Dangar (OEH, 2017a).	**Low** Was not recorded on the site. The site lacks suitable, steep gully habitat.	**Low** Would not be impacted as it is unlikely to occur on the site.
Dichanthium setosum Bluegrass (V,V*)	Bluegrass occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland. It occurs widely on private property, including in the Inverell, Guyra, Armidale and Glen Innes areas. Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture. (Often collected from disturbed open grassy woodlands on the northern tablelands, where the habitat has been variously grazed, nutrient-enriched and water-enriched). It is open to question whether the species tolerates or is promoted by a certain amount of disturbance, or whether this is indicative of the threatening processes behind its depleted habitat (OEH, 2017a).	**Low - Moderate** Was not recorded on site. Potential habitat occurs on site due to the site's disturbed nature.	**Low** Unlikely to occur on site because this species has only been recorded outside of the 10km radius search.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Eucalyptus camaldulensis Eucalyptus camaldulensis population in the Hunter catchment (EP)	The Hunter population occurs from the west at Bylong, south of Merriwa, to the east at Hinton, on the bank of the Hunter River, in the Port Stephens local government area. It has been recorded in the local government areas of Lithgow, Maitland, Mid-Western Regional, Muswellbrook, Port Stephens, Singleton and Upper Hunter. Prior to European settlement, between 10,000 and 20,000 ha of habitat suitable for the River Red Gum occurred in the Hunter catchment. Today only 19 stands are known, occupying at most c. 100 ha, the largest remnant being 15 - 20 ha in extent. Smaller remnants contain only one to several trees. The total number of individuals is estimated to be between 600 - 1000 mature or semi mature trees. May occur with Eucalyptus tereticornis, Eucalyptus melliodora, Casuarina cunninghamiana subsp. cunninghamiana and Angophora floribunda	**Low** Was not recorded on site. This is a conspicuous species and it is highly unlikely that this species was overlooked during surveys.	**Low** Unlikely to occur on site.
Eucalyptus parramattensis subsp. *decadens* Earp's Gum (V, V*)	Occurs in low-lying, often swampy areas and in woodlands with associates such as *Eucalyptus racemosa, E. globoidea* and *Angophora bakeri*. Occurs in two vegetation communities: Tamago Sand Swamp and the Kurri Sands Swamp communities, both of which occur on poor sandy soils from either Pleistocene sands or Permian sediments (OEH, 2017a).	**Low** Was not recorded on site.	**Low** Was not recorded on site.
Euphrasia arguta (CE,CE*)	Euphrasia arguta has only been recorded from relatively few places within an area extending from Sydney to Bathurst and north to Walcha. The Royal Botanic Gardens Specimen Register records an additional location reported and vouchered in 2002 from near the Hastings River; and Euphrasia arguta was also recorded from the Barrington Tops in 2012. Known to occur in the open forest country around Bathurst in sub humid places, on the grassy country near Bathurst, and in meadows near rivers (OEH, 2017a).	**Low** Was not recorded on site. Unlikely to occur due to the highly disturbed nature of the site.	**Low** Unlikely to occur on the site.
Grevillea parviflora subsp. *parviflora* Small-flower Grevillea (V, V*)	Occurs in sandy or light clay soils, usually over thin shales often with lateritic ironstone gravels which are often infertile and poorly drained. Occurs in a range of vegetation types from heath and scrubby woodland to open forest (OEH, 2017a).	**Low** Was not recorded on site. It is unlikely to have been overlooked during surveys.	**Low** Was not recorded on site.
Persicaria elatior Tall Knotweed (V,V*)	Tall Knotweed has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	**Low** Was not recorded on site. The site contains lack appropriate freshwater wetland habitat.	**Low** Was not recorded on site.
Persoonia hirsuta Hairy Geebung (E, E*)	Persoonia hirsuta has a scattered distribution around Sydney. The species is distributed from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. Persoonia hirsuta has a large area of occurrence, but occurs in small populations, increasing the species' fragmentation in the landscape. The Hairy Geebung is found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone (OEH, 2017a).	**Low** Was not recorded on site. It is unlikely to have been overlooked during surveys.	**Low** Was not recorded on site

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Persoonia pauciflora North Rothbury Persoonia (CE, CE*)	Extremely restricted distribution; all but one of the plants which make up the only known population occur within a 2.5 km radius of the original specimen at North Rothbury in the Cessnock local government area. Within this range, there are three main sub-populations which comprise approximately 90% of the total population. The other 10% of the population occurs as scattered individuals in what is a relatively disturbed landscape. It is found in dry open forest or woodland dominated by Spotted Gum (*Corymbia maculata*), Broad-leaved Ironbark (*Eucalyptus fibrosa*) and/or Narrow-leaved Ironbark (*E. crebra*) and supporting a moderate to sparse shrub layer and grassy groundcover. The majority of the population is known to occur on silty sandstone soils derived from the Farley Formation (OEH, 2017a).	**Low** Was not recorded on site. The site contains potential habitat, although this species is not known to occur outside its 2.5 km range of North Rothbury.	**Low** Was not recorded on site
Pomaderris brunnea Brown Pomaderris (E, V*)	Brown Pomaderris is found in a very limited area around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. It also occurs near Walcha on the New England tablelands and in far eastern Gippsland in Victoria.	**Low** Was not recorded. Unlikely to occur due to the highly disturbed nature of the site.	**Low** Was not recorded on site.
Prostanthera cineolifera Singleton Mint Bush (V, V*)	Grows in open woodlands on exposed sandstone ridges. Usually found in association with shallow or skeletal sands. Fire response is unknown, but other Prostanthera species are fire sensitive, with recruitment occurring from the soil seed bank following a fire. Life span is unknown but is expected to be in the vicinity of 10-20 years while the estimated minimum time to produce seed is approximately 3-4 years.	**Low - Moderate** Was not recorded on site. Potential habitat occurs on site due to the site's disturbed nature**.**	**Low** Was not recorded on site
Pterostylis gibbosa Illawarra Greenhood (E, E*)	The Illawarra Greenhood is a deciduous orchid that is only visible above the ground between late summer and spring, and only when soil moisture levels can sustain its growth. Known from a small number of populations in the Hunter region (Milbrodale), the Illawarra region (Albion Park and Yallah) and the Shoalhaven region (near Nowra). All known populations grow in open forest or woodland, on flat or gently sloping land with poor drainage (OEH, 2017a). Occurs adjacent to, but not immediately in, drainage lines on flat to moderately steep slopes formed on Narrabeen sandstone and alluvial soils derived from it.	**Low** Was not recorded. Unlikely to occur due to the highly disturbed nature of the site.	**Low** Unlikely to occur on the site.
Rhizanthella slateri Eastern Australian Underground Orchid (V,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. Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest.	**Low** No known populations within the nearby area (10x10km search area). Unlikely to occur due to the highly altered and disturbed nature of the site.	**Low** Unlikely to occur on the site.
Rhodamnia rubescens Scrub Turpentine (CE)	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Populations of R. rubescens typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m a.s.l. in areas with rainfall of 1,000-1,600 mm. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	**Low** Was not recorded on site. It is unlikely to have been overlooked during surveys.	**Low** Was not recorded on site

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Rhodomyrtus psidioides Native Guava (CE)	Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW.	**Low** The site lacks potential habitat of littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. It is unlikely to have been overlooked during surveys.	**Low** Was not recorded on site.
Threatened Birds			
Anseranas semipalmata Magpie Goose (V)	This species is found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Activities are centred on wetlands, mainly those on floodplains of rivers and large shallow wetlands formed by run-off; breeding can occur in both summer and winter dominated rainfall areas and is strongly influenced by water level; most breeding now occurs in monsoonal areas; nests are formed in trees over deep water; breeding is unlikely in south-eastern NSW (OEH, 2017a).	**Low** Was not recorded on the site. The site lacks suitable wetland habitat.	**Low** Unlikely to occur on site.
Anthochaera Phrygia Regent Honeyeater (CE, CE*)	Inhabits dry open forest and woodlands that support a high abundance and species richness of birds; these areas have large numbers of mature trees, high canopy cover and abundance of mistletoes. A shrubby understorey is an important source of insects and nesting material. Distributed in NSW is very patchy but mainly confined to breeding areas in the Capertee Valley and the Bundarra-Barraba regions (OEH, 2017a).	**Low** The site is predominately cleared of vegetation. This species is unlikely to occur within the site.	**Low** The proposal would not impact this species.
Artamus cyanopterus Dusky Wood swallow (V)	In New South Wales it is widespread from coast to inland, including the western slopes of the Great Dividing Range and farther west. It is sparsely scattered in, or largely absent from, much of the Upper Western region. The Dusky Woodswallow is often reported in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist forests or rainforests.	**Low - Moderate** The site is predominately cleared of vegetation. This species is unlikely to occur within the site.	**Low - Moderate** The site is predominately cleared of vegetation. This species is unlikely to occur within the site.
Botaurus poiciloptilus Australasian Bittern (E, E*)	Requires large, relatively undisturbed freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.) (OEH, 2017a).	**Low** The site lacks large undisturbed wetland.	**Low** The site lacks potential habitat.
Calidris ferruginea Curlew Sandpiper (E,CE*)	Occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Breeds in Siberia and migrates to Australia for the non-breeding period, arriving in Australia between August and November, and departing between March and mid-April. It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts (OEH, 2017a).	**Low** The site lacks potential habitat.	**Low** The site lacks potential habitat.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Callocephalon fimbriatum Gang-gang Cockatoo (V)	The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee. In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (Eucalyptus pauciflora) woodland and occasionally in temperate rainforests. Favours old growth forest and woodland attributes for nesting and roosting (OEH, 2017a).	**Low** The site is predominately cleared of vegetation. This species is unlikely to occur within the site.	**Low** The proposal would not impact this species.
Calyptorhynchus lathami Glossy Black-Cockatoo (V)	The glossy black-cockatoo inhabits coastal woodlands and drier forest areas, open inland woodlands or timbered watercourses where casuarinas or she oaks are common. In NSW, the current distribution of the glossy black-cockatoo covers areas from the coast to the tablelands, and as far west as the Riverina and Pilliga Scrub (OEH, 2017a).	**Low** The site lacks preferred habitat for this species this being forest areas, open inland woodlands or timbered watercourses where casuarinas or she oaks are common.	**Low** The proposal would not impact this species.
Charadrius leschenaultia Greater Sand-plover (V,V*)	The Greater Sand-plover breeds in central Asia from Armenia to Mongolia, moving further south for winter. In Australia the species is commonly recorded in parties of 10-20 on the west coast, with the far northwest being the stronghold of the population. The species is apparently rare on the east coast, usually found singly. In NSW, the species has been recorded between the northern rivers and the Illawarra, with most records coming from the Clarence and Richmond estuaries. Almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks. Roosts during high tide on sandy beaches and rocky shores; begin foraging activity on wet ground at low tide, usually away from the edge of the water; individuals may forage and roost with other waders.	**Low – Moderate** The site lacks preferred habitat for this species this the site lacks preferred habitat for this species this being coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks.	**Low** The site lacks preferred habitat and is unlikely to occur within the site.
Chthonicola sagittata Speckled Warbler (V)	The Speckled Warbler has a patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. The species is most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area (OEH, 2017a).	**Low** The site lacks potential habitat of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Large, relatively undisturbed remnants are required for the species to persist in an area.	**Low** The site lacks potential habitat.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Daphoenositta chrysoptera Varied Sittella (V)	Distribution in NSW is nearly continuous from the coast to the far west. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy (OEH, 2017a).	**Low** The site is predominately cleared of vegetation. This species is unlikely to occur within the site.	**Low** The proposal would not impact this species.
Ephippiorhynchus asiaticus Black-necked Stork (E)	Requires relatively large, open wetlands. Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries. Builds large nests high in tall trees close to water. Widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW (although vagrants may occur further south or inland, well away from breeding areas) (OEH, 2017a).	**Low - Moderate** The site lacks large open wetland; however, this species may occasionally pass through the site.	**Low** The site lacks potential habitat.
Erythrotriorchis radiates Red Goshawk (CE,V*)	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. Red Goshawks inhabit open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus Forest of coastal rivers (OEH, 2017a).	**Low** The site lacks suitable rainforest, melaleuca or riparian habitat.	**Low** The site lacks suitable habitat.
Falco hypoleucos Grey Falcon (E)	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey (OEH, 2017a).	**Low** No records. This is a highly mobile and nomadic species that rarely disperses to coastal NSW. It is highly unlikely that this species would utilise the site.	**Low** The site represents poor habitat for this species and it is unlikely to occur.
Glossopsitta pusilla Little Lorikeet (V)	Found in dry, open *Eucalyptus* forests and woodlands. Feeds on abundant flowering *Eucalyptus* sp., but will also take nectar from *Melaleuca* sp and fruit from *Mistletoe* sp. On the eastern slopes and coastal areas favoured food sources are *Corymbia maculata* (Spotted Gum), *E. fibrosa* (Broad-leaved Ironbark), *E. robusta* (Swamp Mahogany) and *E. pilularis* (Blackbutt). Requires hollow-bearing trees for nesting (OEH, 2017a). One record from 2016 occurs approximately 2km to the site's west (OEH 2017b).	**Low** The site is predominately cleared of vegetation. This species is unlikely to occur within the site.	**Low** The proposal would not impact this species.
Grantiella picta Painted Honeyeater (V, V*)	Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Nomadic; the greatest concentrations of birds and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution (OEH, 2017a).	**Low** The site lacks Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	**Low** The site lacks potential habitat.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Haliaeetus leucogaster White-bellied Sea Eagle (V)	Distributed along the coastline (including offshore islands) of mainland Australia and Tasmania. It also extends inland along some of the larger waterways, especially in eastern Australia. The inland limits of the species are most restricted in south-central and south-western Australia, where it is confined to a narrow band along the coast. It is found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands, typically characterised by the presence of large areas of open water (larger rivers, swamps, lakes, and the sea) (OEH, 2017a).	**Low** The site is predominately cleared of vegetation. This species may occasionally pass through the site but is unlikely utilise the site due to a lack of perching opportunities.	**Low** The proposal would not impact this species.
Hirundapus caudacutus White-throated Needletail (V*)	The White-throated Needletail is widespread in eastern and south-eastern Australia (Barrett et al. 2003; Blakers et al. 1984; Higgins 1999). In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. Further south on the mainland, it is widespread in Victoria, though more so on and south of the Great Divide, and there are few records in western Victoria outside the Grampians and the South West. The species occurs in adjacent areas of south-eastern South Australia, where it extends west to the Yorke Peninsula and the Mount Lofty Ranges. It is widespread in Tasmania (Barrett et al. 2003; Blakers et al. 1984; Higgins 1999). White-throated Needletails only occur as vagrants in the Northern Territory (recorded in the Top End, including around Darwin, Katherine and Mataranka and Tennant Creek; and further south around Alice Springs) and in Western Australia (at disparate sites from the Mitchell Plateau in the Kimberley, south to the Nullarbor Plain and Augusta in the South West, and west to Barrow Island, the Houman Abrolhos and the Swan River Plain) (Barrett et al. 2003; Blakers et al. 1984; Brooker et al. 1979; Sedgwick 1978; Slater 1964; Storr 1987; Storr et al. 1986; Wheeler 1959). The species is also a vagrant to various outlying islands, including Norfolk, Lord Howe, Macquarie, Christmas and Cocos-Keeling Islands (Barrand 2005; Green 1989; McAllan et al. 2004; Schodde et al. 1983; Stokes et al. 1984; Warham 1961a).	**Low** The site is predominately cleared of vegetation. This species is unlikely to occur.	**Low** Unlikely to occur within the site.
Lathamus discolor Swift Parrot (E, E*)	Occurs where eucalypts are flowering profusely or where there are abundant lerp (from sap sucking bugs) infestations. Favoured feed trees include winter flowering species such as *E. robusta* (Swamp Mahogany), *C. maculata* (Spotted Gum), *E. gummifera* (Red Bloodwood), *E. sideroxylon* (Mugga Ironbark) and *E. albens* (White Box). Commonly used lerp infested trees include Grey Box *E. macrocarpa* (Grey Box), *E. moluccana* (Grey Box) and *E. pilularis* (Blackbutt). Breeds in Tasmania during spring and summer and migrates to south-eastern Australia during autumn and winter. In NSW, it mostly occurs on the coast and south west slopes (OEH, 2017a).	**Low** The site is predominately cleared of vegetation. This species is unlikely to occur within the site.	**Low** The proposal would not impact this species.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Ninox connivens Barking Owl (V)	The Barking Owl is found throughout continental Australia except for the central arid regions. Although common in parts of northern Australia, the species has declined greatly in southern Australia and now occurs in a wide but sparse distribution in NSW. Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g., western NSW) due to the higher density of prey on these fertile soils. One record from 1977 occurs approximately 5km to the west of the site (OEH 2017b).	**Low** The site is predominately cleared of vegetation. This species is unlikely to occur within the site.	**Low** The proposal would not impact this species.
Oxyura australis Blue-billed Duck (V)	The Blue-billed Duck is endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. It is generally only during summer or in drier years that they are seen in coastal areas. The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. It will fly if disturbed, but prefers to dive if approached.	**Low** The site lacks deep water in large permanent wetlands and swamps with dense aquatic vegetation. However, this species may occasionally pass through the site.	**Low** The proposal would not impact this species.
Petroica boodang Scarlet Robin (V)	This species is found from south east Queensland to south east South Australia and also in Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. Inhabits dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps (OEH, 2017a).	**Low** Was not recorded on site. The vegetation within the proposed development footprint is considered to be very low value habitat, due to its disturbed nature, however this species may occasionally pass through the site.	**Low** The area of vegetation to be removed would represent an insignificant portion of foraging habitat.
Pomatostomus temporalis temporalis Grey-crowned Babbler (eastern subspecies) (V)	The eastern subspecies (temporalis occurs from Cape York south through Queensland, NSW and Victoria and formerly to the south east of South Australia. This subspecies also occurs in the Trans-Fly Region in southern New Guinea. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions (OEH, 2017a). Numerous recent records occur in the surrounding area of the site (OEH 2017b).	**Low-Moderate** Species was not recorded on site.	**Low** Species was not recorded on site.
Pycnoptilus floccosus Pilot bird (V)	Records ranging from the Great Divide to the blue Mountains. They can be found in ground level of wet forests and moist gullies timbered with mature gumtrees and dense bracken. Known to be poor flyers, they are predominately resident birds.	**Low** Was not recorded on site. The site lacks the potential habitat for this species.	**Low** Would not be impacted as the site lacks the potential habitat.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Rostratula australis Australian Painted Snipe (E,E*)	Most records are from the south east, particularly the Murray Darling Basin, with scattered records across northern Australia and historical records from around the Perth region in Western Australia. 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. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds (OEH, 2017a).	**Low** Was not recorded on site. The site lacks potential wetland habitat with dense cover.	**Low** Would not be impacted as the site lacks potential habitat.
Sternula albifrons Little Tern (E)	Almost exclusively coastal, preferring sheltered environments; however, may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records). Nests in small, scattered colonies in low dunes or on sandy beaches just above high tide mark near estuary mouths or adjacent to coastal lakes and islands. The nest is a scrape in the sand, which may be lined with shell grit, seaweed or small pebbles.	**Low** The site lacks preferred habitat for this species.	**Low** Unlikely to occur.
Tyto novaehollandiae Masked Owl (V)	Found in a range of habitats; locally it occurs within sclerophyll forests and woodlands where preferred prey species occur (being predominantly terrestrial mammals). Requires large tree hollows for nesting and prefers to roost in these hollows as well (OEH, 2017a).	**Low** The site is predominately cleared of vegetation. This species is unlikely to occur within the site.	**Low** The proposal would not impact this species.
Threatened Mammals			
Chalinolobus dwyeri Large-eared Pied Bat (V, V*)	Roosts in caves, crevices in cliffs, old mine workings. Frequents low to mid-elevation dry open forest and woodland close to these features. Requires a canopied habitat (OEH, 2017a).	**Low - Moderate** The site lacks suitable roosting habitat (i.e., caves or similar structures); However, it contains potential foraging habitat.	**Low-Moderate** Any potential impacts on this species will be assessed.
Dasyurus maculatus subsp. *maculatus* Spotted-tailed Quoll (V, E*)	Found in a variety of forested habitats from sclerophyll forests, rainforests and coastal woodlands. Creates a den in fallen hollow logs or among rocky outcrops and is an opportunistic hunter of a variety of prey. Generally, does not occur in otherwise suitable habitats that are in close proximity to urban development. Hunter Region records are largely confined to the surrounding ranges and larger vegetation remnants (OEH, 2017a). Three records occur in the surrounding area of the site; however, none are relatively recent (OEH 2017b).	**Low** Was not recorded on site. The site is predominately cleared of vegetation and contains no potential roosting areas.	**Low** The site lacks potential habitat.
Falsistrellus tasmaniensis Eastern False Pipistrelle (V)	Found in a variety of forest types such as open forests, woodlands and wetter sclerophyll forests (usually with trees >20 m). Roosts in tree hollows. Appears to locally favour upland habitats. A limited number of records occur on the central coast and the Hunter Region (OEH, 2017a).	**Low-Moderate** Was not recorded on site. The site contains some potential roosting and foraging habitat.	**Low-Moderate** Any potential impacts on this species will be assessed.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Micronomus norfolkensis Eastern Coastal Freetail-bat (V)	Distributed south of Sydney extending north into south-eastern Queensland. No records west of the Great Dividing Range. Most records have been reported from dry eucalypt forest and woodland. It is expected that open forested areas and the cleared land adjacent to bushland, constitutes important habitat. Predominantly a tree-dwelling species, roosting in hollows or behind loose bark in mature *Eucalypts* (OEH, 2017a). Several records occur within the surrounding area of the site as recent as 2009 (OEH 2017b).	**Low-Moderate** Was not recorded on site. The site contains some potential roosting and foraging habitat but lacks the typical vegetation structure required of this species.	**Low-Moderate** Any potential impacts on this species will be assessed.
Miniopterus orianae oceanensis Large Bent-winged Bat (V)	Utilises a range of habitats for foraging, including rainforest, wet and dry sclerophyll forests, woodlands and open grasslands. Requires caves or similar structures for roosting habitat (OEH, 2017a). Several records occur in the surrounding area of the site as recent as 2017 (OEH 2017b).	**Low-Moderate** The site contains hollow-bearing trees and potential foraging habitat. Numerous records occur in the surrounding area (OEH 2017b).	**Low-Moderate** Any potential impacts on this species will be assessed.
Myotis Macropus Southern Myotis (V)	Found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. Rarely found more than 100 km inland, except along major rivers. Roosts in groups of 10-15, close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings and under bridges. Forages over streams and pools catching insects and small fish by raking their feet across the water surface (OEH, 2017a).	**Low-Moderate** No preferred habitat i.e., streams or dams.	**Low-Moderate** Site lacks preferred habitat.
Petauroides volans Greater Glider (V*)	Inhabits eucalypt forests and woodlands. Favours forests with a diversity of eucalypt species, due to seasonal variation in preferred feed trees. Shelters and nests in large tree hollows. Prefers large, undisturbed habitat patches (>160 km²). Restricted to eastern Australia, occurring from Windsor Tableland in North Qld through to central Victoria (OEH, 2017a).	**Low** Was not recorded on site. The site is predominately cleared of vegetation and lacks appropriate forest vegetation.	**Low** The site lacks potential habitat.
Petaurus australis Yellow-bellied Glider (V)	The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	**Low** Was not recorded on site. The site is predominately cleared of vegetation and lacks appropriate forest vegetation.	**Low** The site lacks potential habitat.
Petaurus norfolkensis Squirrel Glider (V)	Occurs in eucalypt forests and woodlands where it feeds on sap exudates and blossoms. Tree hollows are required for nesting. Also requires winter foraging resources when the availability of normal food resources may be limited, such as winter-flowering shrubs and small tree species. Sparsely distributed in eastern Australia, from northern Queensland to western Victoria (OEH, 2017a). Numerous records occur in the surrounding area of the site as recent as 2017 (OEH 2017b).	**Low** Was not recorded on site. The site is predominately cleared of vegetation and lacks appropriate forest vegetation.	**Low** The site lacks potential habitat.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Petrogale penicillata Brush-tailed Rock-wallaby (E,V*)	In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north (OEH, 2017a).	**Low** Was not recorded on site. The site is predominately cleared of vegetation and lacks appropriate rocky areas.	**Low** The site lacks potential habitat.
Phascogale tapoatafa Brush-tailed Phascogale (V)	Inhabits dry open forest and woodlands, often in areas with sparse groundcover. Hunts mainly invertebrates, although some vertebrate prey is taken on occasion. Utilises small tree hollows for nesting and refuge sites (OEH, 2017a).	**Low - Moderate** The site lacks preferred habitat.	**Low - Moderate** The site lacks potential habitat.
Phascolarctos cinereus Koala (V, V*)	Occurs in forests and woodlands where it requires suitable feed trees (particularly *Eucalyptus* spp.) and habitat linkages. Will occasionally cross open areas, although it becomes more vulnerable to predator attack and road mortality during these excursions. Within the Greater Hunter Region it is largely confined to the Port Stephens area, the Lake Macquarie hinterland and the Watagan Mountains (OEH, 2017a). One record from 2004 occurs approximately 3km to the north of the site (OEH 2017b).	**Low** Site contains Koala feed trees being the Red Gum and Grey Gum, however, due to the isolated nature of the site, this species is unlikely to occur.	**Low** Species is unlikely to occur within the site.
Potorous tridactylus tridactylus Long-nosed Potoroo (V, V*)	In NSW it is sparsely distributed along the coast and Great Dividing Range. Found in wet eucalypt forests to coastal heaths and scrubs. Requires access to dense vegetation for shelter and the presence of an abundant supply of fungi for food (OEH, 2017a).	**Low** Was not recorded on site. The site is predominately cleared of vegetation and lacks appropriate dense rainforest vegetation.	**Low** The site lacks potential habitat.
Pseudomys novaehollandiae New Holland Mouse (V*)	Inhabits open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. Habitats with deep top soils and soft substrates are preferred for digging burrows. Fragmented distribution across Tasmania, Victoria, New South Wales and Queensland (OEH, 2017a).	**Low** Was not recorded on site. The site is predominately cleared of vegetation and lacks appropriate dense heath vegetation.	**Low** The site lacks potential habitat.
Pteropus poliocephalus Grey-headed Flying-Fox (V, V*)	Occurs along the east coast from Bundaberg, Queensland to Melbourne, Victoria. Utilises a range of habitats including rainforests, sclerophyll forests and woodlands, heaths, swamps and mangroves. Considered an important pollinator and seed disperser of native trees. Colonies usually formed in gullies with a dense vegetation canopy and a water source nearby (OEH, 2017a).	**Low** Was not recorded on site. The site is predominately cleared of vegetation and lacks appropriate forested vegetation.	**Low** The site lacks potential habitat.
Saccolaimus flaviventris Yellow-bellied Sheathtail Bat (V)	A wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	**Low-Moderate** Was not recorded on site. The site contains some potential roosting and foraging habitat.	**Low-Moderate** Any potential impacts on this species will be assessed.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Scoteanax rueppellii Greater Broad-nosed Bat (V)	Forages in moister gullies and wet sclerophyll forests as well as in lightly wooded areas and open spaces / ecotones. Roosts in tree hollows and is relatively widespread within the Lower Hunter Region (OEH, 2017a).	**Low-Moderate** Was not recorded on site. The site contains some potential roosting and foraging habitat.	**Low-Moderate** Any potential impacts on this species will be assessed.
Vespadelus troughtoni Eastern Cave Bat (V)	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. Occasionally found along cliff-lines in wet eucalypt forest and rainforest. 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 (OEH, 2017a).	**Low-Moderate** Was not recorded on site. The site lacks suitable roosting habitat (i.e. caves or similar structures); however, it contains potential foraging habitat.	**Low-Moderate** Any potential impacts on this species will be assessed.
Threatened Hepetofauna			
Heleioporus australiacus Giant Burrowing Frog (V,V*)	The Giant Burrowing Frog is distributed in south eastern NSW and Victoria, and appears to exist as two distinct populations: a northern population largely confined to the sandstone geology of the Sydney Basin and extending as far south as Ulladulla, and a southern population occurring from north of Narooma through to Walhalla, Victoria. Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based (OEH, 2017a).	**Low** Was not recorded on site. The site lacks suitable habitat for this species.	**Low** Unlikely to occur on the site.
Litoria aurea Green and Golden Bell Frog (E, V*)	Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (*Typha* spp.) or spikerushes (*Eleocharis* spp.). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering sites available. Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range, however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands (OEH, 2017a).	**Low - Moderate** Was not recorded on site. Marginal potential habitat occurs.	**Low** No preferred habitat on site
Litoria littlejohni Littlejohn's Tree Frog (V, V*)	Has a distribution that includes the plateaus and eastern slopes of the Great Dividing Range from Watagan State Forest (90 km north of Sydney) south to Buchan in Victoria. The majority of records are from within the Sydney Basin Bioregion with only scattered records south to the Victorian border and this species has not been recorded in southern NSW within the last decade. Records are isolated and tend to be at high altitude.	**Low - Moderate** Was not recorded on site. Marginal potential habitat occurs to the north of the site at the creek line.	**Low** Unlikely to occur on the site.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Mixophyes balbus Stuttering Frog (E, V*)	Found in association with permanent streams through temperate and sub-tropical rainforest and wet sclerophyll forest. Shows a preference for the interiors of large forest tracts in areas with relatively cool mean annual temperatures. These sites are typically free from any disturbance with a thick canopy and relatively simple understory. Occurs along first order streams and occasionally associated with springs. Not associated with ponds or ephemeral pools (OEH, 2017a).	**Low** The site lacks potential habitat of permanent streams through temperate and sub-tropical rainforest and wet sclerophyll forest.	**Low** Unlikely to occur on site as the site lacks potential habitat.
Delma impar Striped Legless Lizard (V,V*)	The Striped Legless Lizard 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. Also occurs in the ACT, Victoria and south-eastern South Australia. Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component.	**Low** Was not recorded on site.	**Low** Would not be impacted as it does not occur on or near the site.
Ecological Communities			
Central Hunter Grey Box-Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions (E, CE*)	Occurs in areas of relatively low rainfall and high temperatures. It is associated mostly with Permian lithology, and is situated on gently undulating hills, slopes and valleys, or occasionally on rocky knolls (OEH, 2017a).	**Low** Not recorded on or near the site.	**Low** Would not be impacted as it does not occur on or near the site.
Central Hunter Ironbark-Spotted Gum-Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions (E, CE*)	Occupies undulating country including low rises and slopes, occurring on all aspects. It may also occur on alluvial and colluvial soils in valleys (OEH, 2017a).	**Low** Not recorded on or near the site.	**Low** Would not be impacted as it does not occur on or near the site.
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (E, V*)	Occurs in the intertidal zone on the shores of estuaries and lagoons that are permanently or intermittently open to the sea (OEH, 2017a).	**Low** Not recorded on or near the site.	**Low** Would not be impacted as it does not occur on or near the site.
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (E)	Known from along the majority of the NSW coast. However, it is distinct from Sydney Freshwater Wetlands which are associated with sandplains in the Sydney Basin bioregion (OEH, 2017a).	**Low** Not recorded on or near the site.	**Low** Would not be impacted as it does not occur on or near the site.

Species / Population	Habitat Description & Known Populations	Likelihood of Occurrence	Potential for Impact
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions (E)	Associated with coastal areas subject to periodic flooding and in which standing fresh water persists for at least part of the year in most years. Typically occurs on silts, muds or humic loams in low-lying parts of floodplains, alluvial flats, depressions, drainage lines, backswamps, lagoons and lakes but may also occur in backbarrier landforms where floodplains adjoin coastal sandplains. Generally occur below 20 m elevation on level areas. They are dominated by herbaceous plants and have very few woody species. The structure and composition of the community varies both spatially and temporally depending on the water regime (OEH, 2017a).	**Low** Not recorded on or near the site.	**Low** Would not be impacted as it does not occur on or near the site.
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions (E)	Occurs on gentle slopes of depressions and drainage flats on the Hunter Valley floor (OEH, 2017a).	**Low** Not recorded on or near the site.	**Low** Would not be impacted as it does not occur on the site.
Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion (V, CE*)	Occurs on colluvial soils derived from Triassic sandstones and conglomerates that has covered the underlying Permian (OEH, 2017a).	**Low** Not recorded on or near the site.	**Low** Would not be impacted as it does not occur on or near the site.
Lower Hunter Spotted Gum-Ironbark Forest in the Sydney Basin Bioregion (E)	Occurs principally on Permian geology in the central to lower Hunter Valley. The Permian substrates most commonly supporting the community belong to the Dalwood Group, the Maitland Group and the Greta and Tomago Coal Measures, although smaller areas of the community may also occur on the Permian Singleton and Newcastle Coal Measures and the Triassic Narrabeen Group (OEH, 2017a).	**Moderate** The site contains species belonging to this EEC. The site is highly disturbed.	**Low** Would not be impacted as the site is heavily disturbed with only remnants remaining.
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (E)	Associated with grey-black clay-loams and sandy loams, where the groundwater is saline or sub-saline, on waterlogged or periodically inundated flats, drainage lines, lake margins and estuarine fringes associated with coastal floodplains (OEH, 2017a).	**Low** Not recorded on or near the site.	**Low** Would not be impacted as it does not occur on or near the site.
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (E)	Associated with humic clay loams and sandy loams, on waterlogged or periodically inundated alluvial flats and drainage lines associated with coastal floodplains (OEH, 2017a).	**Low** Not recorded on or near the site.	**Low** Would not be impacted as it does not occur on or near the site.

Notes: V = Vulnerable (BC Act), **V* =** Vulnerable (EPBC Act), **E** = Endangered (BC Act), **E*** = Endangered (EPBC Act), **CE** = Critically Endangered (BC Act), **CE*** = Critically, **M** = Migratory (EPBC Act)

5 IMPACT ASSESSMENTS

5.1 Description of Potential Impacts

The proposal would require the removal of vegetation within the entire site, which is approximately 2.09 ha of exotic grassland with scattered paddock trees and landscaped gardens with planted native and exotic vegetation.

One (1) hollow bearing tree will be removed by the proposed development which would be suitable for a range of species including small birds and mammals, and microbats. Habitat trees identified for removal shall have their hollow sections salvaged; alternatively, artificial nest boxes will be erected, at a replacement ratio of 1:1.

Due to the historic clearing and current land use within the site and immediate area, the proposal would not impact connectivity.

Potential direct impacts to flora and fauna include:

- Removal of a few native scattered paddock trees, one of which contain hollows;
- Risk of runoff, erosion and sedimentation, during construction;
- Some minor loss of marginal habitat suited for species adapted to open areas;
- Temporary disturbance to fauna during construction work

Potential indirect impacts to flora and fauna include:

- Long and short-term edge effects resulting from the clearing of vegetation (e.g. changes in light filtration, cumulative effect leading to extinction);
- Operational phase impacts on downstream water quality, from overflow events.

Section 5.2 outlines proposed mitigation measures. If these are adhered to, it is considered unlikely that the proposal would significantly impact any threatened species, populations or EECs. Overall, considering the highly modified state of the site, the proposal is not expected to have any significant impacts on native biodiversity.

5.2 Avoidance and Minimisation

The following measures of avoidance have been or are required to be undertaken:

- One (1) hollow bearing tree will be removed by the proposed development which would be suitable for a range of species including small birds and mammals, and microbats. The following is recommended in relation to the removal of these trees:
  - Habitat trees identified for removal shall have their hollow sections salvaged; alternatively, artificial nest boxes will be erected, at a replacement ratio of 1:1. The number and size of replacement nest boxes will be determined following clearing, where an ecologist can adequately assess the hollows on the ground.
  - Habitat trees identified for removal are to have their hollows inspected by a suitably qualified Ecologist and Fauna Handler immediately prior to clearing, to determine if the hollows are being utilised by fauna. Any fauna located are to be trapped and relocated to adjoining areas not subject to development pressure prior to the tree being felled.
- Hydrological and sediment/erosion controls must be implemented where necessary to maintain the quality and quantity of pre-development water flows into downstream areas.

5.3 Biodiversity Conservation Act 2016

An assessment under section 7.3 of the BC Act (i.e. five-part test) has been undertaken to identify whether the proposal will significantly impact on the following threatened species and EECs. The threatened species test of significance is used to determine if a development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. It is applied as part of the Biodiversity Offsets Scheme entry requirements and for Part 5 activities under the Environmental Planning and Assessment Act 1979.

An assessment under section 7.3 of the BC Act (i.e. five-part test) has been undertaken to identify whether the proposal will significantly impact on the following threatened species and TECs.

- Large-eared Pied Bat *(Chalinolobus dwyeri)*
- Eastern Freetail-bat *(Mormopterus norfolkensis)*
- Little Bentwing-bat (*Miniopteus australis*)
- Eastern Bentwing-bat *(Miniopterus schreibersii subsp. oceanensis)*
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis)*

- Greater Broad-nosed Bat (*Scoteanax rueppellii)*
- Yellow Bellied Sheath-tailed Bat (*Saccolaimus flaviventris)*
- Eastern Cave Bat *(Vespadelus troughtoni)*

5.3.1 Biodiversity Offset Scheme

The BC Act sets out the Biodiversity Offsets Scheme (BOS) framework, which aims to avoid, minimise and offset impacts on biodiversity from development and clearing, and to ensure land that is used to offset impacts is secured in-perpetuity. The types of developments that the BOS applies to, include local development (under Part 4 of the EP&A Act) that is likely to significant affect threatened species / EECs, as determined by:

- BOS development threshold; or
- Assessment of Significance; or
- Development on Areas of Outstanding Biodiversity Value (AOBV) (note, at this stage AOBVs include areas of declared critical habitat under the *Threatened Species Conservation Act 1995.* This site does not contain any such areas).

The BOS development threshold has two elements:

- Area Criteria – whether the amount of native vegetation being cleared exceeds a threshold area set out below; and
- Biodiversity Values Map (BVM) – whether the impacts occur on an area mapped on the BVM.

Consideration of the site, under the BOS development threshold is discussed below.

5.3.2 Area Criteria

The minimum lot size of the site is 0.045 ha. The threshold for vegetation clearance for lots of this minimum lot size is ≥0.25ha. The proposal would require the removal of <0.12ha of native vegetation, therefore the proposal would not trigger the area threshold of > 0.25ha, as such a BAM (Biodiversity Assessment Method) report will not be required. Refer to Figure 5-1 for area of native vegetation being removed.

5.3.3 Biodiversity Values Map

The site is not mapped as having high biodiversity value in the BVM. Refer to Figure 5-2 below.

Note:
Boundaries are not survey accurate.
Although all reasonable care has been taken to ensure the information shown on this map is up to date and accurate, no guarantee is given that the information portrayed is free from error or omission. Please verify the accuracy of all information prior to use.

FIGURE 5-1: NATIVE VEGETATION WITHIN THE SITE

Ref No 3151

CLIENT	Client
SITE DETAILS	No.176 Wollombi Road Farley
DATE	15 September 2022

NORTH

0 25 50 75

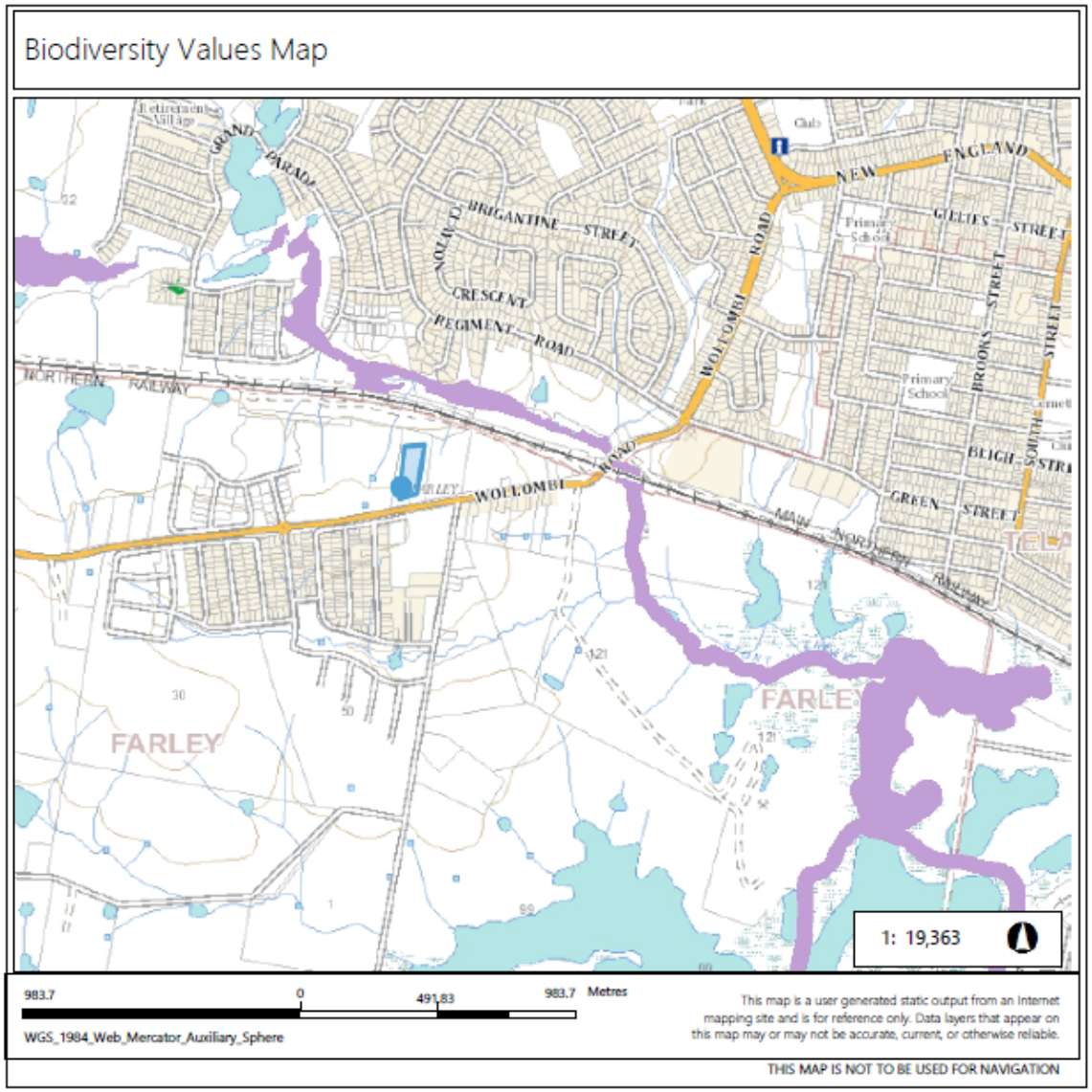
SCALE 1500 @ A3

PIXELDRAFTING

Firebird ecoSultants Pty Ltd
ABN - 16 105 985 993
Level 1, 146 Hunter Street, Newcastle NSW 2300
P O Box 354 Newcastle NSW 2300

firebird

Figure 5-2: Extract of Biodiversity Values Map (Site: Lot 23 DP701849)



5.3.4 Test of Significance

In accordance with Section 7.3 of the BC Act, the following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species 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,

No threatened species occur on site.

Threatened microbats

Large-eared Pied Bat (*Chalinolobus dwyeri*), Eastern Freetail-bat (*Mormopterus norfolkensis*), Little Bentwing-bat (*Miniopterus australis*), Eastern Bentwing-bat (*Miniopterus schreibersii* subsp. *oceanensis*), Greater Broad-nosed Bat (*Scoteanax rueppellii*), Eastern Cave Bat (*Vespadelus troughtoni*), Yellow Bellied Sheath-tailed Bat (*Saccolaimus flaviventris)* and **Eastern False Pipistrelle (*Falsistrellus tasmaniensis*).**

These species are highly mobile and known to travel large distances to forage. They generally forage in structurally open habitat and associated edge habitat and roost in trees containing hollows, or (in the case of M. schreibersii oceanensis (Eastern Bentwing-bat), Chalinolobus dwyeri (Large-eared Pied Bat), Vespadelus troughtoni (Eastern Cave Bat), Miniopterus australis (Little Bentwing-bat), Falsistrellus tasmaniensis (Eastern False Pipistrelle) and the Miniopterus schreibersii subsp. oceanensis (Eastern Bentwing-bat), caves or similar structures). The development footprint contains roosting habitat and potential foraging habitat.

The majority of the site is cleared and can be best described as scattered paddock trees, dominated by exotic pasture grasses and landscaped gardens. The vegetation within the site has been highly modified from its original form to an extent that it is no longer considered to be a native vegetation community. The removal of approximately 2.09 ha of exotic grassland is considered to be an insignificant area of low value foraging habitat, particularly considering that similar foraging habitat is widespread in the area.

One (1) hollow bearing tree will be removed by the proposed development which would be suitable for a range of species including microbats. Habitat trees identified for removal shall have their hollow sections salvaged; alternatively, artificial nest boxes will be erected off site in a patch of forest located approximately 500m to the site's west, at a replacement ratio of 1:1.

Provided that the mitigation measures listed in Section 5.2 are employed, the action proposed is not likely to have an adverse effect on the life cycle of these species such that a viable local population of these species is likely to be placed at risk of extinction.

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 EECs occur within or near the 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

The proposal would remove approximately 2.09 ha of exotic grassland which is considered to be an insignificant area of low value foraging habitat for species adapted to open areas, particularly considering that similar foraging habitat is widespread in the area.

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,

The vegetation to be removed consists of scattered paddock trees over exotic grassland and landscaped gardens. The site and surrounding area have been historically cleared for agricultural land use, as such the site is already isolated. No areas of habitat would become fragmented or isolated by the proposal.

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 majority of the site is cleared and can be best described as scattered paddock trees, dominated by exotic pasture grasses and landscaped gardens. The vegetation within the site has been highly modified from its original form to an extent that it is no longer considered to be a native vegetation community. The removal of approximately 2.09 ha of exotic grassland is considered to be an insignificant area of low value foraging habitat, particularly considering that similar foraging habitat is widespread in the area.

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 declared AOBV occur in or near the site. The proposal is unlikely to affect any such areas, either directly or indirectly.

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 following Key Threatening Processes (KTP's) are considered to be potentially associated with the assessed threatened species / EEC:

'Clearing of Native Vegetation'

The removal of a few scattered native paddock trees is considered to be an insignificant portion of native vegetation. The proposal is unlikely to increase the impact of this KTP.

'Loss of Hollow-bearing Trees'

One (1) hollow bearing tree will be removed by the proposed development which would be suitable for a range of species including small birds and mammals, and microbats. Habitat trees identified for removal shall have their hollow sections salvaged; alternatively, artificial nest boxes will be erected, at a replacement ratio of 1:1.

'Invasion of Native Plant Communities by Exotic Perennial Grasses'; 'Invasion, Establishment and Spread of Lantana'; 'Invasion and Establishment of Exotic Vines and Scramblers'

The site is already exposed to edge effects and contains several weedy species. It is unlikely that the proposal would increase the impact of this KTP, provided that appropriate protocols and procedures to prevent spread of weeds are followed during construction works.

'Human Caused Climate Change'

It is considered that the modification of the site would constitute a minor incremental change. It is unlikely that the proposal would significantly increase the impact of this KTP.

5.3.5 BC Act Conclusion

Assessments of significance under Section 7.3 of the BC Act have acknowledged that the proposal has the potential to impact on 9 threatened species; this impact however is not significant and is unlikely to place any viable local populations at risk of extinction. Therefore, the application of the Biodiversity Offsets Scheme is not required.

5.4 Koala Habitat Protection SEPP 2020

This policy applies to each local government area listed in Schedule 1 and includes Maitland LGA.

First Consideration – Is the Land 'Potential Koala Habitat'?

Schedule 2 of the Koala Habitat Protection SEPP lists numerous 'Feed Tree' species that are considered indicators of 'Potential Koala Habitat'. The presence of any of the species listed on a site proposed for development triggers the requirement for an assessment for 'Potential Koala Habitat'.

> "Areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component".

Although there are specimens of *Eucalyptus robusta* and *Eucalyptus tereticornis* at the site, the site is not considered to constitute 'Potential Koala Habitat' as defined by Koala Habitat Protection SEPP. In any case searches for signs of koala by scat and scratch marks have been undertaken. No signs of koalas within the site were noted. No further provisions of Koala Habitat Protection SEPP apply.

5.5 Water Management Act 2000

The *Water Management Act 2000* (WM Act) provides a number of mechanisms for protection of water sources via the water management planning process. If a 'controlled activity' is proposed on 'waterfront land', an approval is required under Section 91 (2) of the WM Act. This proposal does not require assessment under this Act.

5.6 Environment Protection and Biodiversity Conservation Act 1999

The EPBC Act focuses Commonwealth interests on MNES. The MNES identified in the EPBC Act, which require assessment and approval by the Commonwealth, include:

- World Heritage Properties;
- National Heritage Places;
- Wetlands of International Importance (declared Ramsar wetlands);
- Listed threatened species and ecological communities;
- Listed migratory species;
- Commonwealth marine areas;
- Commonwealth land; and
- The Great Barrier Reef Marine Park.

The assessment and approval process applies to any action that has, will have, or is likely to have, a significant impact on MNES. The MNES and study area-specific responses are as follows.

World Heritage Areas

The study area is not a World Heritage area, and is not in close proximity to any such area.

National Heritage Places

The study area is not part of a National Heritage Place, and is not in close proximity to any such area.

Wetlands of International Importance (declared Ramsar wetlands)

The study area is not part of RAMSAR Wetland area, and is not in close proximity to any such area.

Listed Threatened Species and Ecological Communities

As detailed in previous Table 4.1, the following threatened species, listed under the EPBC Act, may potentially occur on the site:

Threatened Species

- Large-eared Pied Bat

The Bilateral Agreement between NSW State and the Federal Government allow for these species to be addressed under one piece of legislation, which has been undertaken above, under the BC Act.

Listed Migratory Species

The following nationally listed migratory species potentially occur within a 10 km radius of the study area:

- *Rhipidura rufifrons* - Rufous Fantail
- *Apus pacificus* - Fork-tailed Swift
- *Cuculus optatus* - Oriental Cuckoo, Horsfield's Cuckoo

The site is almost entirely cleared of native vegetation and is mostly characterised by scattered paddock trees, exotic pasture grasses. The proposed development would not result in a significant impact on these species.

Commonwealth Marine Area

The proposal will not have a significantly adverse effect on any Commonwealth marine area, as there are no such marine areas occur within the region.

Commonwealth Land

The proposal will not have a significantly adverse effect on any Commonwealth lands, as there are no such lands occur within the region.

The Great Barrier Reef Marine Park

The proposal will not have a significantly adverse effect on any Great Barrier Reef Marine Park, as there are no such parks occur within the region.

EPBC Act Assessment Conclusion

Based on the above, it is considered the current proposal would be unlikely to impact on any MNES under the EPBC Act. Refer to Thus referral to the Commonwealth DoE is not considered necessary.

6 CONCLUSION/RECOMMENDATIONS

This assessment aims to recognise the relevant requirements of the *Environmental Planning and Assessment Act 1979* (EP&A Act), *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

A literature review and desktop research was combined with flora and fauna surveys, and a habitat assessment. Commonwealth, state and local government policies and guidelines formed the basis of project surveying and assessment methodology.

Assessments of Significance under the BC Act (five-part tests) and Significant Impact Assessments under the EPBC Act have acknowledged that the proposal has the potential to impact on a number of threatened species and one (marginally classified) EEC. This impact however is not significant and, provided that the recommendations below are adhered to, is unlikely to place any viable local populations / communities at risk of extinction.

It is concluded that the BOS and concurrence of OEH is not required. It is also concluded that an EPBC Act Referral and approval of DEE is not required. Finally, the provisions of SEPP 44 have also been considered and it is concluded that the site does not constitute 'Potential Koala Habitat'.

Recommendations:

The following recommendations should be conditioned as part of any development consent;

- One (1) hollow bearing tree will be removed by the proposed development which would be suitable for a range of species including small birds and mammals, and microbats. The following is recommended in relation to the removal of these trees:

  - Habitat trees identified for removal shall have their hollow sections salvaged; alternatively, artificial nest boxes will be erected at a replacement ratio of 1:1. The number and size of replacement nest boxes will be determined following clearing, where an ecologist can adequately assess the hollows on the ground.

  - Habitat trees identified for removal are to have their hollows inspected by a suitably qualified Ecologist and Fauna Handler immediately prior to clearing, to determine if the hollows are being utilised by fauna. Any fauna located are to be trapped and relocated to adjoining areas not subject to development pressure prior to the tree being felled.

  - The clearing of any habitat trees shall be timed to take place outside of the breeding periods of the fauna species likely to use the site, or as approved by council.

- A suitably qualified Ecologist and Fauna Handler should be present during habitat tree removal to ensure any displaced native fauna can be dealt with appropriately.

- Hydrological and sediment/erosion controls must be implemented where necessary to maintain the quality and quantity of pre-development water flows into downstream areas.

7 BIBLIOGRAPHY

Bell, S.A.J. (2016) Volume 2: Vegetation Community Profiles, Lake Macquarie Local Government Area. Working Draft v2. Unpublished Report to Lake Macquarie City Council. March 2016. Eastcoast Flora Survey.

Bell, S.A.J. & Driscoll, C. (2016) Volume 1: Vegetation Mapping Report, Lake Macquarie Local Government Area. Stages 1 - 6. Unpublished Report to Lake Macquarie City Council. March 2016. Eastcoast Flora Survey.

Cropper, S. (1993). *Management of Endangered Plants*. CSIRO Publications, East Melbourne, Victoria.

DEC (2004) *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities. Working Draft.* NSW Department of Environment and Conservation 2004.

DEC (2006) *Recovery Plan for Large Forest Owls: Powerful Owl) Ninox strenua, Sooty Owl (Tyto tenbricosa) and Masked Owl (Tyto novaehollandiae).* October 2006.

DECCW (2011) *Lower Hunter and Central Coast Regional Vegetation Survey VIS_ID 2225. Lower_hunter_REMS_VISmap_2225.* DECCW, Sydney.

DECC (2007) *Threatened species assessment guidelines: The assessment of significance.* Department of Environment and Climate Change (NSW), Sydney.

DEE (2017) *EPBC Act Protected Matters Search Tool*. Accessed March 2017.

GeoLINK (2013) *Grey-headed Flying Fox Management Strategy for the Lower Hunter*. Prepared for Department of Sustainability, Environment, Water, Population and Communities. GeoLINK, Coffs Harbour.

House, S (2003) *Lower Hunter & Central Coast Regional Biodiversity Conservation Strategy, Technical Report, Digital Aerial Photo Interpretation & Updated Extant Vegetation Community Map*. Report to Lower Hunter & Central Coast Regional Environmental Management Strategy, Callaghan, NSW, May 2003.

Klienfelder (2017) *Flora and Fauna Assessment: Proposed Residential Subdivision Main Road Edgeworth*. Prepared for Mcloy Group, June 2017.

Matthei L.E. (1995) *Soil Landscapes of the Newcastle 1:100,000 Sheet*, NSW Department of Land and Water Conservation, Sydney.

Murray, M., Bell, S., Hoye, G. (2002) *Flora and fauna survey Guidelines: Lower Hunter Central Coast Region 2002.* Lower Hunter & Central Coast Regional Environmental Management Strategy, NSW.

NSW Office of Water (2012) *Guidelines for Riparian Corridors on Waterfront Land.* NSW Department of Primary Industries.

NSW Rural Fire Service (2006) *Planning for Bushfire Protection – A Guide for Councils, Planners, Fire Authorities, Developers and Home Owners.*

NSW Scientific Committee (2012) *Listing guidelines version 1.3, January 2012. Guidelines for interpreting listing criteria for species, populations and ecological communities under the NSW Threatened Species Conservation Act*.

Office of Environment and Heritage (2016) *NSW Guide to Surveying Threatened Plants.* February 2016.

OEH (2017a) *Saving our Species*, accessed March 2017. <http://www.environment.nsw.gov.au/threatenedspecies/>.

OEH (2017b) *Atlas of NSW Wildlife (NSW BioNet),* accessed March 2017. <http://www.bionet.nsw.gov.au/>.

OEH (2017c) *Six Maps,* accessed March 2017. <http://maps.six.nsw.gov.au>.

Pennay, M., Law, B. & Leinhold, L. (2004) *Bat Calls of NSW. Region based guide to the echolocation calls of microchiropteran bats*. Department of Environment and Conservation, NSW.

Scotts, D. (2003) *Key habitats and corridors for forest fauna: A landscape framework for conservation in north-east New South Wales*. NSW NPWS Occasional Paper 32, NSW National Parks and Wildlife Service, Sydney.

Thackway R, Cresswell ID (1995) *An interim biogeographic regionalisation for Australia: a framework for setting priorities in the National Reserve System Cooperative Program.* (Version 4.0. ANCA: Canberra).

Triggs, B. (2004) *Tracks, Scats and Other Traces: a Field Guide to Australian Mammals.* Oxford University Press, Australia.

Van Dyck, S., Gynther, I. and Baker, A. (2013) *Field Companion to the Mammals of Australia*. New Holland Publishers, Sydney.

APPENDIX A SITE PLANS

1/948329

1 DA02 SUBDIVISION PLAN
1 : 600

DO NOT SCALE

USE FIGURED DIMENSIONS AT ALL TIMES. IF IN DOUBT CHECK WITH THE BUILDER. CONTRACTOR'S TO CHECK AND VERIFY ALL LEVELS, DATUMS AND DIMENSIONS ON SITE AND SHALL REPORT ANY DISCREPANCIES OR OMMISSIONS TO THE BUILDER PRIOR TO COMMENCEMENT OF WORK AND DURING THE CONSTRUCTION PHASE.

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DA ISSUE

REV	DATE	DESCRIPTION	BY
1	20/07/2022	ISSUED FOR DA APPLICATION	JP

GENERAL NOTES:

NORTH:

02 9636 2465 | 02 9688 4762 | www.bathla.com.au
The Bathla Group
137 Gilba Road, Girraween NSW 2145
PO Box 270, Wentworthville NSW 2145
Connect with us
"Building dreams together"

PROJECT:
176 WOLLOMBI ROAD, FARLEY 2320

LOT NUMBER:
LOT 23 DP 701849

DRAWING TITLE:
SUBDIVISION PLAN

PROJECT No.	
DATE:	JULY 2022
DRAWN BY:	SS
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REV:	1
ISSUED BY:	JP

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APPENDIX B QUALIFICATIONS

Curriculum Vitae

Sarah Jones
Ecologist / Bushfire Consultant
B.Env.Sc, G.Dip.DBPA
BPAD-A Certified Practitioner (BPD-PA-26512)

Qualifications / Licences

- Bachelor of Environmental Science (The University of Newcastle)
- Graduate Diploma in Design for Bush Fire Prone Areas (University of Western Sydney)
- *BAAS18020 Accredited Assessor, as required by the Biodiversity Conservation Regulation 2017 and accredited to apply the BAM*
- NSW Scientific Licence SL100533
- Fire Protection Authority of Australia (FPAA) Member
- BPAD- A (Alternate Solutions) Bushfire Planning and Design Certified Practitioner – Certification No: PBD-PA-26512
- RFS / PIA NSW Consulting Planners Bushfire Training Course
- WorkCover NSW OHS General Induction for Construction Work in NSW

Areas of Expertise

Sarah Jones is an ecologist and bushfire planning specialist with over 20 years ecological experience within both the consulting, and the government sector. Sarah is an Accredited Biodiversity Assessor and has an extensive range of Ecological Assessment reporting experience and ecological field experience. Experience within the consulting industry has primarily included a wide range of flora and fauna assessment disciplines as required by a wide range of public and private clients. Sarah has a strong grounding in threatened flora and fauna species, endangered ecological communities, ground dependent ecosystems and populations. She has experience in the preparation of environment impact assessments in terrestrial environments, constraints and opportunities reporting, flora and fauna monitoring and survey, vegetation and conservation management plans.

Sarah Jones is accredited to undertake Biodiversity Development Assessment Reports (BDAR) under the Biodiversity Conservation Act and Tests of Significance (5-part test) to assess biodiversity / flora and fauna / ecological impacts when undertaking Development Applications (DA) and Major Projects / State Significant Developments (SSD) in New South Wales.

Sarah Jones is a (Bushfire Planning and Design) BPAD-A Certified Practitioner through Fire Protection Australia (FPA). BPAD Accredited Practitioners are recognised by industry, regulators, fire agencies, end-users and the community as providers of professional bushfire assessment, planning, design and advice services. The Scheme provides an enhanced level of confidence for government and the community that practitioners are accredited by a suitably robust scheme that is administered by the peak national body for fire safety.

Employment History

Ecologist and Bushfire Planner
Firebird ecoSultants Pty Ltd
Jan 2011 to present

Consultant Role Development Planner – (Flora and Fauna)
Lake Macquarie City Council
June 2013 –February 2015
Previous temporary role August - October 2012

Senior Ecologist / Bushfire Planner

RPS Group plc.
June 2006 to Jan 2011

Development Planner (Flora & Fauna)
Lake Macquarie City Council
Jan 2005 to Sept 2005

Ecologist / Bushfire Consultant
Harper Somers O'Sullivan
Nov 2001 to Jan 2005

Ecologist
Ecotone Environmental Consultants, Waratah, NSW
Jan 2001 – Nov 2001

Volunteer Environmental Educator
Community Partnership Newcastle City Council
Sept 2000 – Dec 2000

APPENDIX C EPBC PROTECTED MATTERS SEARCH

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 05-Sep-2022

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	52
Listed Migratory Species:	18

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	14
Commonwealth Heritage Places:	1
Listed Marine Species:	24
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	2
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	23
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Hunter estuary wetlands	10 - 20km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Central Hunter Valley eucalypt forest and woodland	Critically Endangered	Community may occur within area	In feature area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area	In feature area
Hunter Valley Weeping Myall (Acacia pendula) Woodland	Critically Endangered	Community may occur within area	In buffer area only
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In feature area
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limosa lapponica baueri			
Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pycnoptilus floccosus			
Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rostratula australis			
Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
FROG			
Litoria aurea			
Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area	In feature area
Mixophyes balbus			
Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Mixophyes iteratus			
Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
MAMMAL			
Chalinolobus dwyeri			
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Petauroides volans			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat may occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Petrogale penicillata](#)			
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
[Potorous tridactylus tridactylus](#)			
Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat may occur within area	In feature area
[Pseudomys novaehollandiae](#)			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Pteropus poliocephalus](#)			
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
[Acacia bynoeana](#)			
Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Arthraxon hispidus](#)			
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Caladenia tessellata](#)			
Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Cryptostylis hunteriana](#)			
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Cynanchum elegans](#)			
White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area
[Dichanthium setosum](#)			
bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eucalyptus glaucina Slaty Red Gum [5670]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus parramattensis subsp. decadens Earp's Gum, Earp's Dirty Gum [56148]	Vulnerable	Species or species habitat known to occur within area	In feature area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Grevillea parviflora subsp. parviflora Small-flower Grevillea [64910]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat may occur within area	In buffer area only
Persoonia pauciflora North Rothbury Persoonia [67214]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area	In feature area
Prostanthera cineolifera [11233]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rutidosis heterogama Heath Wrinklewort [13132]	Vulnerable	Species or species habitat known to occur within area	In feature area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tetratheca juncea Black-eyed Susan [21407]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Pandion haliaetus](#) Osprey [952]		Species or species habitat known to occur within area	In buffer area only
[Tringa nebularia](#) Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [11627]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [11609]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11605]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11608]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12638]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [12650]	NSW	In buffer area only
Defence		
Defence - SCOBIE BARRACKS ; 2/17 RNSWR RUTHERFORD ; RUTHERFORD GRES DEPOT [10055]	NSW	In buffer area only
Defence - Defence Housing Authority		

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [11626]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11628]	NSW	In buffer area only
Transport and Regional Services - Airservices Australia		
Commonwealth Land - Airservices Australia [11629]	NSW	In buffer area only
Unknown		
Commonwealth Land - [16528]	NSW	In buffer area only
Commonwealth Land - [11624]	NSW	In buffer area only
Commonwealth Land - [11625]	NSW	In buffer area only
Commonwealth Land - [12652]	NSW	In buffer area only

Commonwealth Heritage Places [Resource Information]

Name	State	Status	Buffer Status
Historic			
Maitland Post Office	NSW	Listed place	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
[Chalcites osculans as Chrysococcyx osculans](#) Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
[Haliaeetus leucogaster](#) White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
[Lathamus discolor](#) Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
[Merops ornatus](#) Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Werakata	State Conservation Area	NSW	In buffer area only
Werakata	National Park	NSW	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Development of the Hunter Economic Zone Industrial Estate	2004/1417	Controlled Action	Post-Approval	In buffer area only
F3 to Branxton Link Electricity Adjustments	2007/3814	Controlled Action	Post-Approval	In buffer area only
Gas Transmission Pipeline	2011/5917	Controlled Action	Completed	In buffer area only
Hunter Employment Zone - Stage 1, Road and Rail access	2002/653	Controlled Action	Completed	In buffer area only
Kurri Kurri Gas Fired Power Station	2021/8888	Controlled Action	Post-Approval	In buffer area only
Kurri Kurri Lateral Pipeline Project	2021/9113	Controlled Action	Assessment Approach	In buffer area only
New dual carriageway from F3 Fwy to Branxton Link	2007/3431	Controlled Action	Post-Approval	In buffer area only
Pelaw Main Bypass Road near Cessnock	2007/3891	Controlled Action	Completed	In buffer area only
Queensland Hunter Gas Pipeline, approximately 825 km in length	2008/4483	Controlled Action	Completed	In buffer area only
Upgrade of approx 32km of Main Northern Railway, including construction of 3rd track	2009/4897	Controlled Action	Post-Approval	In feature area
Not controlled action				
Abel Coal Project	2007/3695	Not Controlled Action	Completed	In buffer area only
Battery Recycling Facility, Kurri Kurri, NSW	2016/7782	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Bloomfield Colliery - Life of Mine Extension - 20km northwest of Newcastle, NSW	2017/8132	Not Controlled Action	Completed	In buffer area only
construction of 33kV substation and relocation of power line	2005/2395	Not Controlled Action	Completed	In buffer area only
Hebburn No 2 Colliery	2001/301	Not Controlled Action	Completed	In buffer area only
Hunter Natural Gas Pipeline	2004/1902	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Queensland Hunter Gas Pipeline, approximately 833 km in length	2008/4620	Not Controlled Action	Completed	In buffer area only
Remediation and demolition of Hydro Aluminium Kurri Kurri Smelter, NSW	2015/7496	Not Controlled Action	Completed	In buffer area only
Revised alignment Hunter Natural Gas Pipeline	2005/2470	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Collection and reprocessing of carbonaceous materials	2005/2196	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Rehabilitation of Hexham Swamp	2003/1244	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Rezoning and Residential Development of Avery's Village, Cessnock, NSW	2007/3880	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

Bioregional Assessments			
SubRegion	BioRegion	Website	Buffer Status
Hunter	Northern Sydney Basin	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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APPENDIX D RECORDED SPECIES LIST

FLORA

CLASS MAGNOLIOPSIDA (Flowering Plants)	
ASTERACEAE	
*Conyza bonariensis**	Flaxleaf Fleabane
*Senecio madagascariensis**	Fireweed
*Hypochoeris radicata**	Catsear
BIGNONIACEAE	
*Jacaranda mimosifolia**	Jacaranda
FABACEAE	
*Trifolium repens**	White Clover
LAURACEAE	
*Cinnamomum camphora**	Camphor Laurel
MORACEAE	
Ficus macrophylla	
*Morus nigra**	Black Mulberry
MYRTACEAE	
Callistemon viminalis	Weeping Bottlebrush
Corymbia maculata	Spotted Gum
Eucalyptus robusta	Swamp Mahogany
Eucalyptus crebra	Narrow-leaved Ironbark
Eucalyptus punctata	Grey Gum
Eucalyptus pilularis	Blackbutt
Leptospermum petersonii	Lemon-scented Teatree
Melalueca Sp.	
Melaleuca armillaris	Bracelet Honey-myrtle
PLANTAGINACEAE	
*Plantago lanceolata**	Lamb's Tongue
POACEAE	
*Pennisetum clandestinum**	Kikuyu Grass
*Cynodon dactylon**	Common Couch

** Denotes non-endemic / introduced species*

APPENDIX E Preliminary Tree Assessment

MONACO

DESIGNS PL

PRELIMINARY
TREE ASSESSMENT

For:
Bathla

Site Address:
176 Wollombi Rd,
Farley

Site Inspection Date:
15.08.2022

Report Date:
17.08.2022

Job No.
6274

mobile: 0409123200
email: paul@monaco.net.au abn: 69078380168

TREE REPORTS LANDSCAPE PLANS
VEGETATION MANAGEMENT PLANS

IMPORTANT NOTES *– Trees on development sites (and neighbouring properties) can potentially render it undevelopable, or reduce potential yield. Developers and builders should obtain advice from a Consulting Arborist prior to purchasing a site, or engaging a Building Designer. A simple site analysis of significant trees and determining their TPZ's could save all parties involved significant time and money.*

Many trees contain internal defects, of which many cannot be determined without dissection. These defects could be from genetic, human or environmentally influenced factors that may be hazardous to persons or property. Although deaths are rare from falling trees, common sense should prevail in extreme weather conditions.

This report was not written with the intention of being used in a court of law.

TABLE OF CONTENTS

1. Introduction

1.1 This pre-development assessment has been commissioned by Ms Kaushal of Bathla, to assess the species, health, general condition and retention value of the trees located at the pre-mentioned address, (hereafter 'The Site').

2. Documents Provided

2.1 Survey by Innovative Survey Solutions was relied upon for the tree locations – Ref 210401 – Dated 07.10.2021 (zoomed extract provided for clarity).

3. Method and Limits

3.1 Observations and recordings of the trees were made using the Visual Tree Assessment (VTA) at ground level during the site inspection. The VTA '*interprets the body language of trees, linking internals defects to the trees own repairs structures....so trees that are apparently dangerous should be distinguished from trees that are really dangerous...*' (Mattheck 2007). No invasive tests, ie dissections, excavation, probing or coring were undertaken.

3.2 Access was predominately available to the site. These findings are summarised in the Tree Assessment Schedule in Section 5.

3.3 Weather conditions were extremely windy, hence complete VTA may be compromised.

3.4 All endemic species will be deemed to have a high retention value irrespective of their health and condition, unless dead / dying or dangerous. These traits may not be tolerated within a residential setting

3.5 Measurements may include survey data, or be amended where required. DBH's that are rounded up (units of 10's) have been measured as a straight diametre. DBH's to units of 1's have been determined by measuring the trunk circumference for more accuracy as required.

3.6 Photographs included within this report were taken at time of initial inspection, unless noted otherwise.

3.7 Terminology used in this report is explained in Section 6.

3.8 Crown spreads are taken as an average of the radii, unless the crown is severely distorted or the issue requires more accurate dimensioning.

3.9 The Australian Standard AS 4970-2009 'Protection of Trees on Development Sites' is utilised where applicable for determining minimum clearances where works encroach the tree protection zone (TPZ). However, distances may be varied by the Consulting Arborist once other factors are taken into consideration, including but not limited to; *individual species tolerance to disturbance, soil geology and topography, meso / microclimate, proposed construction / engineering methods and potential Arboricultural techniques that could be utilised.*

3.10 No advice that site is Bushfire prone.

4. The Site

4.1 The site is highly disturbed and includes stock grazing.

5. Tree Assessment Schedule

No.	Scientific Name	Age Class	Health	Condition	Height (m)	Spread (m)	D BH (mm)	On / Off Site	Disease	Retention Value	TPZ / SRZ (m) [Based on AS4970- Can be varied subject to detailed inspection]
1	*Corymbia maculata*	M	G	G	16	10	522	On	-	Very High	6.26 / 2.519 Animal trunk scuffs. Cavity and wound in co-dominant junction
2	*Cinnamomum camphora*	M	G	G	8	16	Multi	On	-	Low	-
3	*Eucalyptus pilularis* (as)	M	G	G	> 20	> 20	713	On	-	Very High	8.56 / 2.87
4	*Jacaranda mimosifolia*	M	G	G	8	10	500 Bse	On	-	Mod	6 / 2.47 Multi trunk
5	*Melaleuca armillaris*	O	A	A	7	10	Multi	On	Y	Low	-
6	*Eucalyptus punctata* (as)	M	A	P	12	15	600 Bse	On	Y	Low	- Significant fungal attack
7	*Melaleuca armillaris*	M	G	G	8	10	500 Bse	On	-	Mod/ Low	-
8	*Eucalyptus robusta*	M	G	G	16	12	900 Bse	On	-	High	10.8 / 3.16 Dual Trunk
9	*Eucalyptus punctata (as)*	M	A	P	16	12	525	On	Y	Low	- Significant fungal attack, thinning crown and trunk wound
10	*Leptospermum petersonii*	M	G	g/ a	4	5	350 Bse	On	Y	Low	-
11	*Callistemon viminalis*	M	G	G	4	5	250	On	-	Low	-
12	*Morus nigra*	Exempt specimen									
13	*Eucalyptus species*	M	G	G	18	> 20	>1k	On	-	Very High	12 / 3.31
14	*Ficus macrophylla*	M	G	G	12	> 20	748	On	-	Mod/ High	8.98 / 2.93
15	*Eucalyptus species*	Dead									
16	*Callistemon viminalis*	O	A	A	6	6	500 Bse	On	Y	Low	- Deadwood, thinning crown and coppiced
17	*Callistemon viminalis*	O	A	P	5	10	600 Bse	On	Y	Low	- Dead codominant leaders
18	*Melaleuca 'CV'*	M	G	G	4	6	350 Bse	On	-	Low	-
19	*Eucalyptus crebra* (as)	M	G	G	16	> 20	487	On	-	Very High	5.847 – 2.45
20	*Unidentified deciduous shrub*	M	?	P	< 3	5	150 Bse	On	Y	Low	Trunk wound and borers

Regards
Paul Monaco

Paul Monaco, Bach. Hort. Sc. (AQF 7), Arboriculture (AQF 5), Bushland Regeneration (AQF 3).
Landscape and Horticultural Consultant, Consulting Arborist.
Quantified Tree Risk Assessment (QTRA) - 3923
Limitation of liability

This report has been prepared by the arborist and must be accepted on the basis that all reasonable attempts have been made to identify factors and features relevant to the tree(s) specified. Unless otherwise stated, observations have been made by eye from ground level (VTA).

It must be noted that any opinions given by the arborist relating to the health, desirability, or significance of any tree will not necessarily coincide with the opinions of the relevant council authorities or their Tree Management Officers.

Surveys are not undertaken by Monaco Designs PL. Hence we cannot confirm their accuracy.

Tree related hazards should be kept in perspective with man made hazards. Roof materials, advertising material, general rubbish etc can cause serious harm if they fall in extreme weather conditions. Trees should be seen in perspective with other essentials / desirables of life, which are not hazard free.

6. Terminology Used In This Report

6.1 AGE CLASSES: - (I) Immature refers to a juvenile tree. (S) Semi-mature, refers to a tree between growth stages immature and mature. Can be sexually mature. (M) A tree at sexual maturity, or approaching full size with opportunity for further growth. (O) Over-mature, refers to a tree past its peak growth or health and is either in, or about to enter decline.

6.2 HEALTH CLASS: - A combination of several factors including, but not limited to; crown density, leaf colour, presence of epicormic shoots, ability to withstand disease invasion and degree of die back. Good (G) / Average (A) / Poor (P).

6.3 CONDITION CLASS: - refers to the trees form and growth habit as a result of its environment (aspect, suppression by other trees and soils). It takes into consideration structural defects as per the VTA. Good (G) / Average (A) / Poor (P).

6.4 DIAMETER AT BREAST HEIGHT (DBH):- Expressed in millimetres, this is the average radius measured at 1400mm from the ground for single trunk specimens. For multiple trunked specimens, the measurement is taken below the flange of the branch collar. Where a tree is trunkless, diameter is determined by taking an average of the radius and noted at ground level.

6.5 DISEASE: - Includes a range of factors, biotic and abiotic in nature that could affect the long term vitality of the specimen, ie pests, pathogens, cankers, soil compaction etc.

6.6 RETENTION VALUE: - Has been determined based on (but not limited to) the following criteria:-

6.6.1 Zero – Tree is a noxious / environmental weed, diseased or damaged beyond remediation and removal required or exempt from Local Council's TPO.

6.6.2 Low – An immature specimen that could be replaced with new tree planting, poor representation of the species, negative impact on amenity or visual significance within the landscape.

6.6.3 Moderate – Tree has a fair contribution to visual character, good representation of species, semi-mature / mature specimen, potential habitat relevance.

6.6.4 High – Excellent visual character / amenity, representation of species, mature specimen, indigenous / endemic species.

6.6.5 Very High - Endangered or threatened species, heritage / historical or cultural significance, endemic species / remnant vegetation, habitat for endangered or threatened fauna, commemorative planting. Trees on neighbouring properties, including Council Land.

6.7 Tree Protection Zone (TPZ):- As defined by AS 4970-2009 – 'A specified area above and below ground and at a given distance from the trunk set aside for the protection of a trees roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development'. TPZ = DBH x 12 (represented as radius).

6.8 Structural Root Zone (SRZ):- As defined by AS 4970-2009 – 'The area around the base of a tree required for the trees stability in the ground'.

6.9 VTA – Visual Tree Assessment – described by Dr Clause Mattheck in '*The Body Language of Trees*'. This assessment process is supported by The International Society of Arboriculture, as a system to inspect trees for indicators of structural defects that may pose a risk of failure.

6.10 (as): - Assumed species

7. References / Bibliography

7.1 AS 4373 – 1996 'Pruning of Amenity Trees'.

7.2 AS 4970-2009 'Protection of Trees on Development Sites'.

7.3 Brooker, I. and Kleinig, D. (1996) 'Eucalyptus, An Illustrated Guide to Identification – Vol. 1' Reed Books Australia.

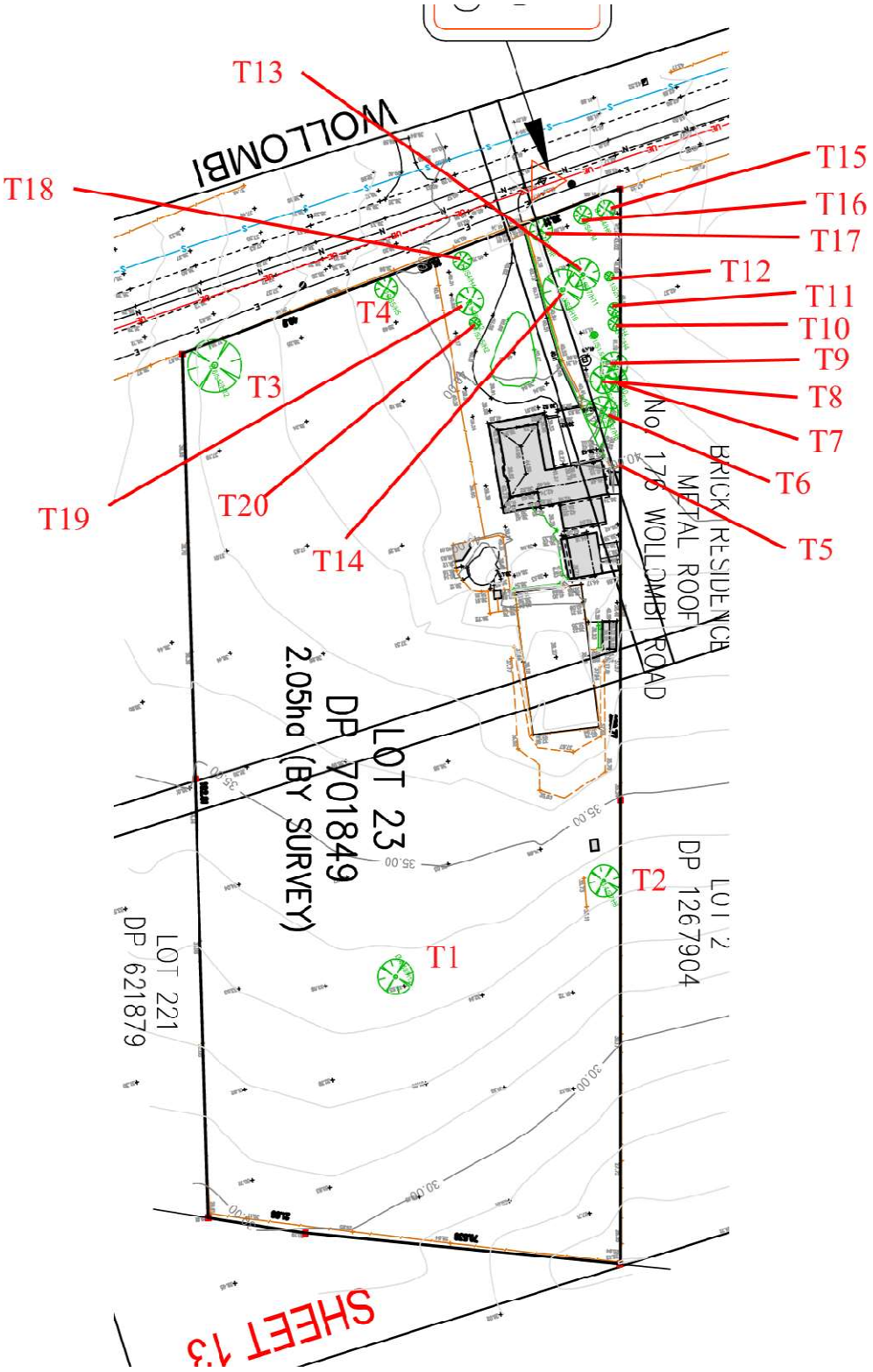
7.4 Fairley, A and Moore, P. (1989) 'Native Plants of the Sydney District', Kangaroo Press, Kenthurst NSW.

7.5 Harris, R.W. ET AL (2004) 'Arboriculture – 4th Ed.', Prentice Hall.

7.6 Robinson, L. (1994) 'Field Guide to the Native Plants of Sydney', Kangaroo Press.

7.7 Mattheck, C. (2015) 'The Body Language of Trees – Encyclopedia of Visual Tree Assessment' Karlsruhe Institute of Technology.

8. Survey Plan - NTS



9. Assorted Pictures

Plate 1 – T1

Plate 2 – T2

Plate 3 – T7-T9

Plate 4 – T13-T14

Plate 5 – T14

Plate 6 – T19