Ecological Assessment Report

for the

Proposed Manufactured Home Estate at Lot 7 DP 810442 Lot 8 DP 810442 Part Lot 11 DP 597659 (No. 27, 29 & Part 33) Metford Road, TENAMBIT NSW

Prepared by: WILDTHING Environmental Consultants

38c Stapleton Street
WALLSEND NSW 2287
ABN: 41 033 509 215

For:

Regal Hunter Properties Pty Ltd
C/. HDB Town Planning & Design
44 Church Street
Maitland NSW 2320

Job No: 12838

May 2024

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

Project Name	Ecological Assessment Report for the proposed Manufactured Home Estate at Lot 7 DP 810442 Lot 8 DP 810442 Part Lot 11 DP 597659 (No. 27, 29 & Part 33) Metford Road, TENAMBIT NSW	
Project Number	12838	
Prepared By	Dr Kylie Bridges Ecologist BEnvSc Hons PhD BAAS20005	
Fieldwork By	Nicola Mohr Ecologist BScMSc BAAS23007	
	Dr Kylie Bridges Ecologist BEnvSc Hons PhD BAAS20005	
Reviewed By	Daryl Harman Senior Ecologist BEnvSc BAAS17074	
Date	24 May 2024	
Version Number	1	

Disclaimer

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

Summary

Flora, fauna and habitat studies have been undertaken for the proposed Manufactured Home Estate within Lots 7 & 8 DP 810442 and Part Lot 11 DP 597659 (No. 27, 29 & Part 33) Metford Road, Tenambit NSW. The 4.65ha irregular rectangular shaped subject land consisted of three Lots, Lot 7 and Lot 8 DP 810442 and Lot 11 DP 597659. The proposed development area (subject land) consisted of Lot 7 and Lot 8 DP 810442 and part Lot 11 DP 597659 and was located on the eastern side of Metford Road in lands to the immediate south and east of the Regal Inn. The subject land is Zoned RU2 – Rural Landscape and located in Maitland City Council LGA. The subject land contained managed open grassy areas, with some scattered trees and planted gardens. The site has been utilised as a hobby farm for the past 35 years. The vegetation within the proposed development is a disturbed with a mix of native and exotic species. Few areas of vegetation within the subject land have remained in close to their original state with lack of native midstorey and shrub species. Two pre-existing dwellings and associated infrastructure are present within the subject land.

Native vegetation in the form of sclerophyll woodland was present in small remnant patches around pre-existing dwellings within the subject land. The subject land also contained large areas of heavily grazed grassland with scattered remnant and planted trees. Native vegetation had been subject to disturbances such as past vegetation clearance, property maintenance activities, past and ongoing grazing (horses and a sheep were observed on site during fieldwork), weed incursion and planted gardens established within the site. The dominant canopy species was *Corymbia maculata* (Spotted Gum).

The vegetation of the study area was stratified by assigning the vegetation to Plant Community Types (PCTs) detailed in the NSW Vegetation Information System (VIS) classification database, the following PCTs were present within the study area:

- PCT 3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest (0.51ha);
- Couch grassland (1.47ha);
- Exotic groundcover and planted gardens (2.67ha);
- Managed Roadside Grassland (0.06ha).

Couch Grassland was assessed under the Streamlined Biodiversity Development Assessment Report – Planted Native Vegetation (SBDAR - Planted) Module. The remaining native vegetation within the subject land did not exceed the BOS clearing threshold.

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

- Removal of up to 0.51ha of highly disturbed PCT 3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest;
- Removal of up to 0.51ha of highly disturbed example of the EEC Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions;
- Removal of up to 1.47ha of Couch Grassland;
- Removal of up to 3.15ha of Grazed Exotic Groundcover with Planted Gardens;
- Removal of four hollow-bearing trees;
- Removal of 75 native trees (Appendix B);
- Removal of known hunting habitat for *Haliaeetus leucogaster* (White-bellied Sea-Eagle);
- Removal of known roosting and hunting habitat for *Miniopterus australis* (Little Bentwing Bat)
- Removal of known habitat for the threatened species *Pomatostomus temporalis temporalis* (Grey-crowned Babbler), including one unkempt Grey-crowned Babbler Nest (as of February 2024);
- Removal of known foraging habitat for the threatened species *Pteropus poliocephalus* (Grey-headed Flying Fox);
- Removal of known habitat for a number of the addressed threatened species.

PCT 3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest was found to be most consistent with the Endangered Ecological Community - Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions. The proposal will result in an incremental reduction

of Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions within the local area. However considering the current disturbance to this community within the site and taking into the consideration the recommendations the proposal is unlikely to significantly impact this endangered ecological community such that its local occurrence is likely to be placed at risk of extinction

No threatened flora species were recorded within the survey area during fieldwork. Of the addressed 25 flora species assessed, the subject land was found to contain suitable habitat for 5 of the addressed species. The proposal may result in an incremental loss of marginal habitat for these threatened flora species; however, it is considered not likely that the proposal would significantly affect the life cycle of any of these threatened flora species or place any viable local populations of at risk of extinction.

Four threatened species were recorded utilising the site during surveys. Although no individuals were observed, an unkempt nests/roost attributed to *Pomatostomus temporalis temporalis* (Grey-crowned Babbler) was located within the subject land during fieldwork. An individual *Haliaeetus leucogaster* (White-Bellied Sea Eagle) was observed hunting over the subject land and adjoining lands during surveys. *Pteropus poliocephalus* (Grey-headed Flying-Fox) were observed flying into the subject land and foraging on *Syagrus romanzoffiana* (Cocus Palm) during stag watching and spotlighting surveys. *Miniopterus australis* (Little Bentwing Bat) was positively identified within the subject land during the Anabat survey.

Pteropus poliocephalus (Grey-headed Flying-Fox) were observed flying into the subject land and foraging on *Syagrus romanzoffiana* (Cocus Palm) during stag watching and spotlighting surveys. The treed areas within the subject land contained suitable foraging habitat for this megachiropteran bat species. No camps were observed within the subject land. The removal of vegetation from this site may result in an incremental loss in foraging habitat in the local area. Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) to search for Grey-headed Flying-Fox. If a Grey-headed Flying-Fox is located within the clearance area then a suitably qualified ecologist will be required to undertake a health assessment of the animal and relocate the specimen if healthy or take to a vet for treatment.Taking into consideration the relatively large amount of suitable foraging habitat within the local area, the proposal is unlikely to disrupt the life cycle of *Pteropus poliocephalus* such that local extinction would occur.

Miniopterus australis was positively identified within the site during the microchiropteran bat call survey. The entire site is likely to contain suitable hunting habitat for this microchiropteran bat species. Preferred roosting habitat in the form of caves was absent within the site, however man-made structures in the form of two dwellings and associated infrastructure was located within the subject land. Roosting in the form of tree hollows was present within the study area. The removal of vegetation and 4 hollow-bearing trees from this site may result in an incremental loss in the quality of hunting and roosting habitat in the local area. . Nest boxes are to be installed into retained trees at a ratio of two nest boxes per hollow-bearing tree. The nest boxes are to be installed prior to tree clearance within retained trees. The artificial nest boxes should be installed onto a tree in the nearest adjacent area of similar habitat by a suitably qualified ecologist. This mitigation measure will ensure that no net loss of hollows will result from the proposed development. Taking into consideration the relatively large amount of suitable hunting and roosting habitat retained within the subject land and within the local area, the absence of preferred roosting habitat within the site and the recommendation for compensatory nest boxes the proposal is unlikely to disrupt the life cycle of *M. australis* such that local extinction would occur.

One tree was found to contain and unkempt Grey-crowned Babbler nests/roost. The western portion of the site is likely to contain suitable nesting habitat for this avifauna species. The removal of vegetation from this site may result in an incremental loss in nesting habitat in the local area. . The removal of Grey-crowned Babbler habitat will require the following:

- Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) to search for Grey-crowned Babbler nests. If a nest is located within the clearance area then a relocation plan is to be implemented.
- If any nests are found to contain eggs or nestlings no clearance works will be allowed within the vicinity of any of the nests until the young have fledged (Only the breeding female usually sits on the eggs, the remainder of the birds will roost in another nearby nest). The nests/roosts will likely require an Elevated Work Platform (EWP) to access the nest

- Once it is determined there is no active breeding nests, they will then be relocated by an ecologist into neighbouring trees which are to remain in-situ.

Taking into consideration the relatively large amount of suitable nesting habitat retained within the local area and the recommendations within this report, the proposal is unlikely to disrupt the life cycle of Grey-crowned Babbler such that local extinction would occur.

No other threatened fauna species were recorded during fieldwork. Of the 52 remaining addressed threatened fauna species the subject site was considered to contain suitable habitat for 31 species. The proposal will result in a small incremental reduction habitat for the above species. Given the small impact it is unlikely that the proposal will have a significant impact on these threatened fauna species such that a local extinction would occur.

Haliaeetus leucogaster (White-Bellied Sea Eagle) was observed hunting within the immediate local area and briefly over the far east of the subject land. Surveys did not record any evidence of breeding in the form of large stick nests in trees within the subject land or in close proximity despite targeted searches. The removal of White-Bellied Sea Eagle habitat will require the following:

- Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) to search for White-Bellied Sea Eagle nests. If a nest is located within the clearance area then Maitland City Council is to be immediately notified and a plan is to be implemented.

Taking into consideration the relatively large amount of suitable hunting habitat retained within the local area and the recommendations within this report, the proposal is unlikely to disrupt the life cycle of White-Bellied Sea Eagle such that local extinction would occur.

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

In conclusion, the proposed subdivision, manufactured housing and associated infrastructure at 27, 29 and Part 33 Metford Road, Tenambit will result in an incremental reduction of remnant habitat, within the subject land and local area, however, is unlikely to have a significant impact on any addressed threatened species, endangered populations or threatened ecological communities considered within this report.

CONTENTS

Acronyms and Abbreviations used in this report

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

1.0 INTRODUCTION

Flora, fauna and habitat studies have been undertaken for the proposed Manufactured Home Estate within Lots 7 & 8 DP 810442 and Part Lot 11 DP 597659 (No. 27, 29 & Part 33) Metford Road, Tenambit NSW. The investigations were in accordance with the requirements of the *Environmental Planning and Assessment Amendment Act 2017* (EP&A Act 2017), the *Biodiversity Conservation Act 2016* (BC Act 2016) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act 1999). The results are presented here in the form of an Ecological Assessment.

1.1 THE SUBJECT LAND

The 4.65ha irregular rectangular shaped subject land consisted of three Lots, Lot 7 and Lot 8 DP 810442 and Lot 11 DP 597659. The proposed development area (subject land) consisted of Lot 7 and Lot 8 DP 810442 and part Lot 11 DP 597659 and was located on the eastern side of Metford Road in lands to the immediate south and east of the Regal Inn. Residential development was located to the west, and north of the subject land, rural style lots were located to the south and retention ponds associated with the Morpeth Waste Treamtement Works are located to the east of the subject land. The subject land is zoned RU2: Rural Landscape.

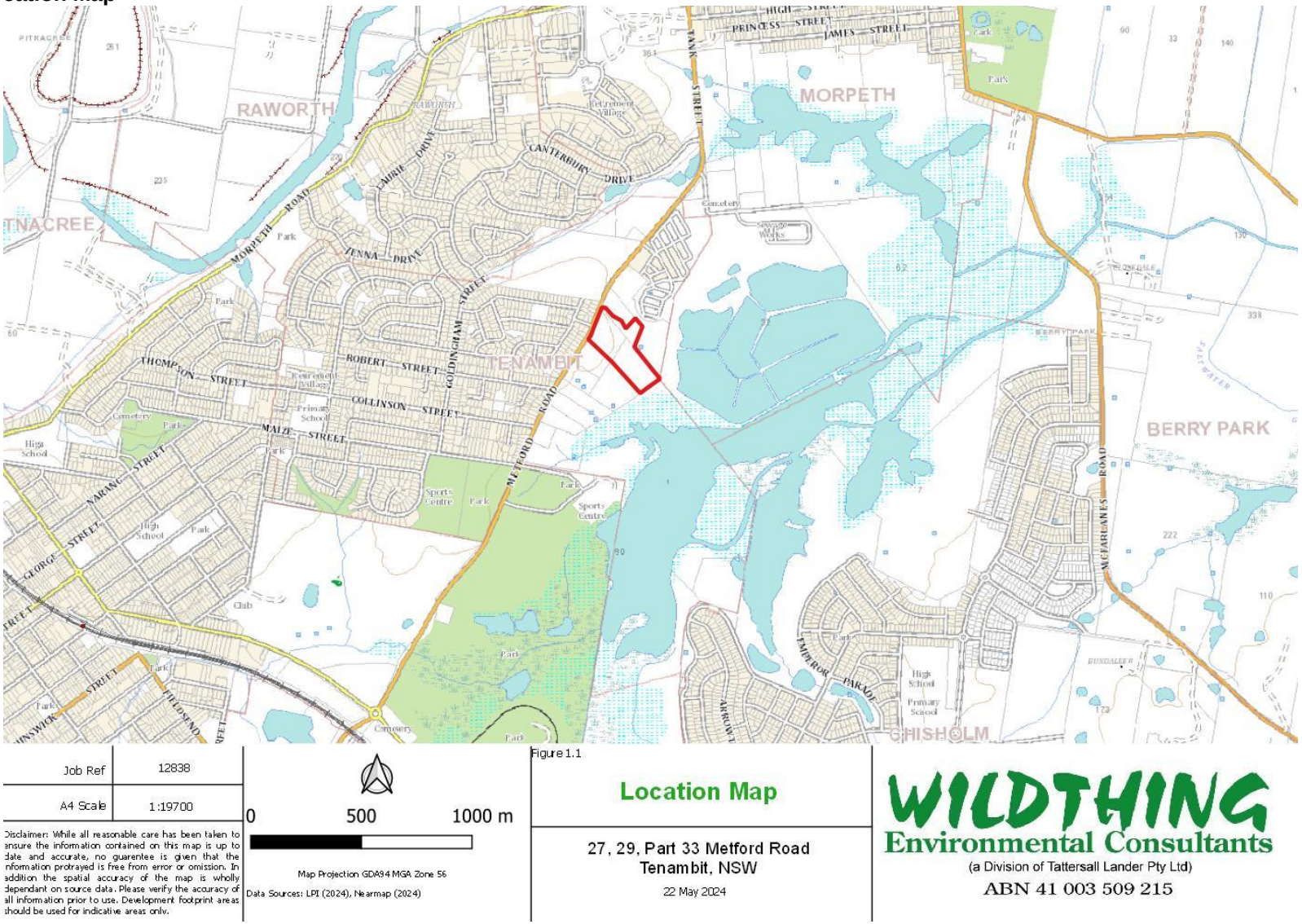
The subject land contained managed open grassy areas, with some scattered trees and planted gardens. The site has been utilised as a hobby farm for the past 35 years. The vegetation within the proposed development is a disturbed with a mix of native and exotic species. Few areas of vegetation within the subject land have remained in close to their original state with lack of native midstorey and shrub species. Two pre-existing dwellings and associated infrastructure are present within the subject land. The Regal Inn is present within the western portion of Lot 11 DP 597659.

A location map and aerial photo of the subject land has been provided in Figures 1.1 and 1.2.

1.2 THE PROPOSAL

The proponent intends to subdivide and construct a manufactured housing development within the subject land. The 4.65ha operational footprint and construction footprint (subject land) is positioned within an area that contains two established dwellings with associated infrastructure and a hobby farm. The subject land is proposed to be entirely cleared for development, including demolishing the pre-existing dwellings and associated infrustructure. The subject land is zoned RU2: Rural Landscape.The proposal is shown in Figures 1.3 and 1.4.

Figure 1.1 Location Map



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

Figure 1.2 Aerial Image of Subject Land

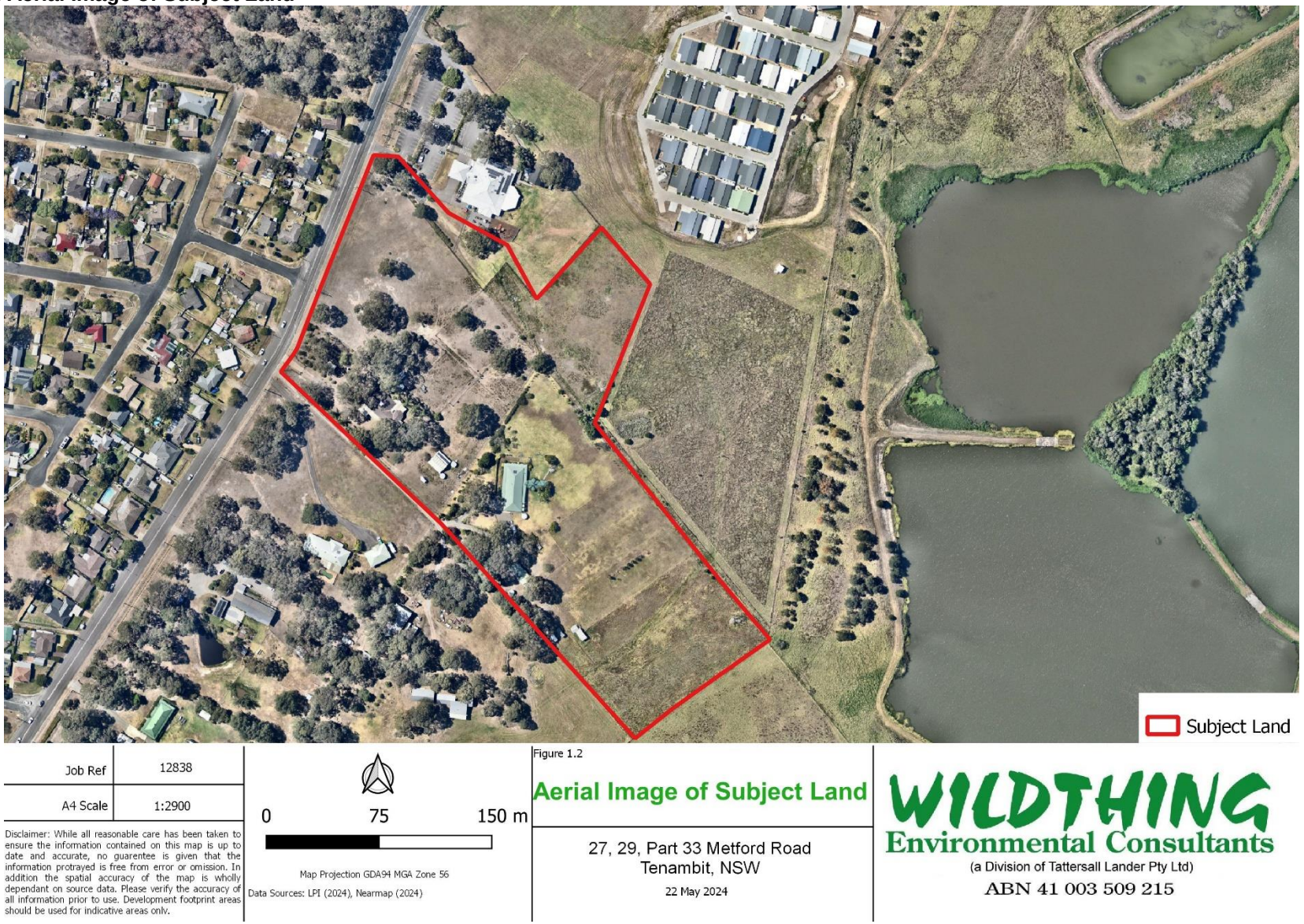


Figure 1.3 Aerial image of Subject Land and Design Plans

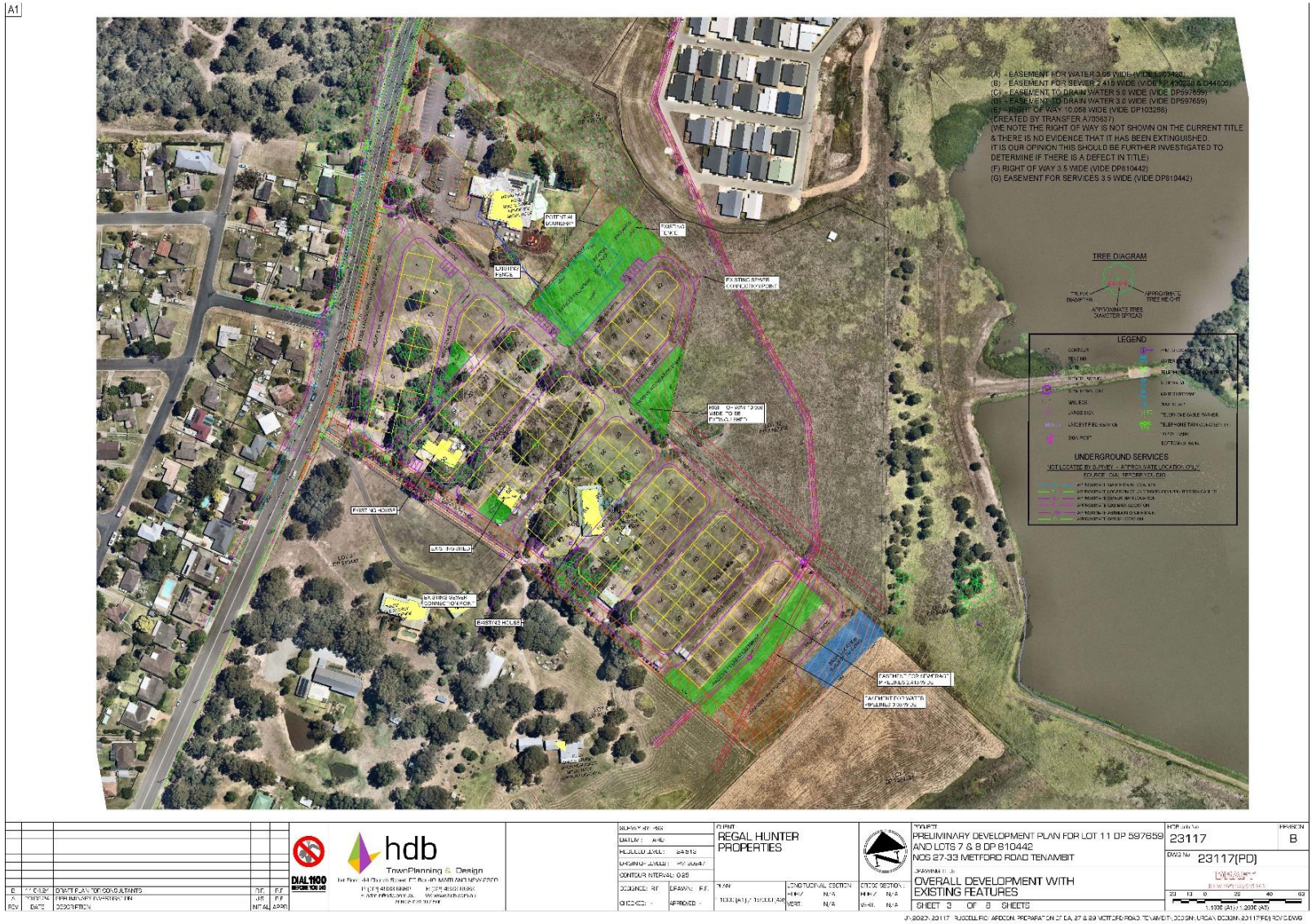
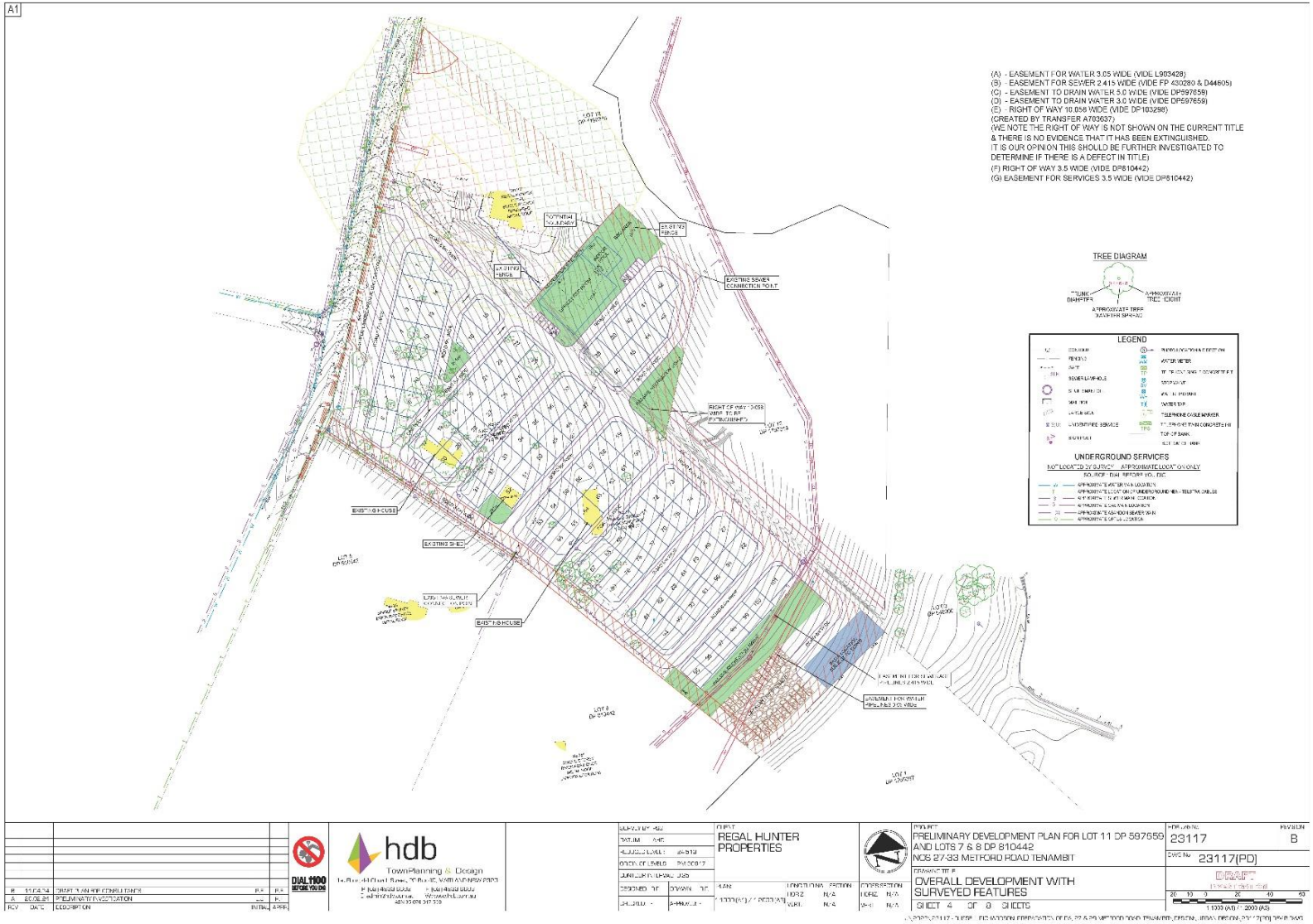


Figure 1.4 Design Plans



2.0 SUBJECT LAND CONTEXT

The subject land is located within the Sydney Basin Bioregion and Hunter Sub-bioregion (regions gazetted by the Minister, or an Interim Biogeographical Regionalisation of Australia (IBRA Bioregion). The subject land is located within the Maitland City Council Local Government Area (LGA) and is zoned as RU2: Rural Landscape.

2.1 HYDROGEOGRAPHY

There were no prescribed streams or waterbodies present within the subject land. Four Mile Creek was located to the south of the subject land. Morpeth Waste Treatment Works were located to the east. Figure 1.1 shows the prescribed streams wetlands in relation to the assessment area.

2.2 TOPOGRAPHY AND SOILS

The subject land fell within the BioNet Landscapes (formerly Mitchell Landscapes) (DPIE 2017) Newcastle Coastal Ramp (Nrm) in the west and Lower Hunter Channels and Floodplains (Het) in the east. The majority of the subject land was located within the Newcastle Coastal Ramp (Nrm) Landscape.The subject land contained one Soil Landscape, Beresfield (bez). The landscape is characterised by undulating rises to rolling low hills on Permian sediments iin the south east of the Hunter Region. Soils are shallow to moderately deep (25 - <100 cm), imperfectly drained Brown and Yellow Kurosols (Yellow Podzolic Soils and Soloths); and moderately deep to deep (50 - <150 cm), imperfectly drained Red, Brown and Yellow Kurosols (Red and Yellow Podzolic Soils and Soloths).

2.3 VEGETATION

Native vegetation in the form of sclerophyll woodland was present in small remnant patches around pre-existing dwellings within the subject land. The subject land also contained large areas of heavily grazed grassland with scattered remnant and planted trees. Native vegetation had been subject to disturbances such as past vegetation clearance, property maintenance activities, past and ongoing grazing (horses and a sheep were observed on site during fieldwork), weed incursion and planted gardens established within the site. The dominant canopy species was *Corymbia maculata* (Spotted Gum).

3.0 LEGISLATIVE CONTEXT

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

3.1 NSW ENVIRONMENTAL PLANNING AND ASSESSMENT AMENDMENT ACT 2017

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

3.2 NSW BIODIVERSITY CONSERVATION ACT 2016

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

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

The subject land is not mapped on the Biodiversity Values (BV) Map (Figure 3.1) and as such, the proposal does not automatically trigger entry into the BOS through impacting BV Mapped Land. The clearing threshold for the site is 1ha. Although the proposal will be clearing 0.51ha (PCT 3433) of native remnant vegetation and 1.47ha of planted native vegetation (*Cynadon dactylon* (Couch)), the proposal does not exceed the threshold triggers for entry into the BOS after consultation with Maitland City Council due to the nature of the planted vegetation.

As 1.47ha of vegetation present within the subject land was classified as 'Planted Native Vegetation', Assessment Method (BAM) 2020 Appendix D: Streamlined Assessment Module – Planted Native dated 6 December 2022; applies (Appendix B). The Planted Native Vegetation Module may be used in conjunction with the standard BAM to assess parts of the subject land.

The Module is divided into the following parts:

- D.1 – Decision-making key – to identify whether a standard BAM or a streamlined assessment is required
- D.2 – Assessment of planted native vegetation for threatened species habitat.

D.1 of the Module is used to assess if D.2 applies. If Questions 1–3 of the decision-making key are not applicable to the planted native vegetation, apply D.2 – Assessment of planted native vegetation for threatened species habitat. Assessment of planted native vegetation for threatened species habitat has

been completed in accordance with Appendix D. This vegetation type is not required to be further assessed using the BAM, and was thus excluded from consideration for the clearing threshold.

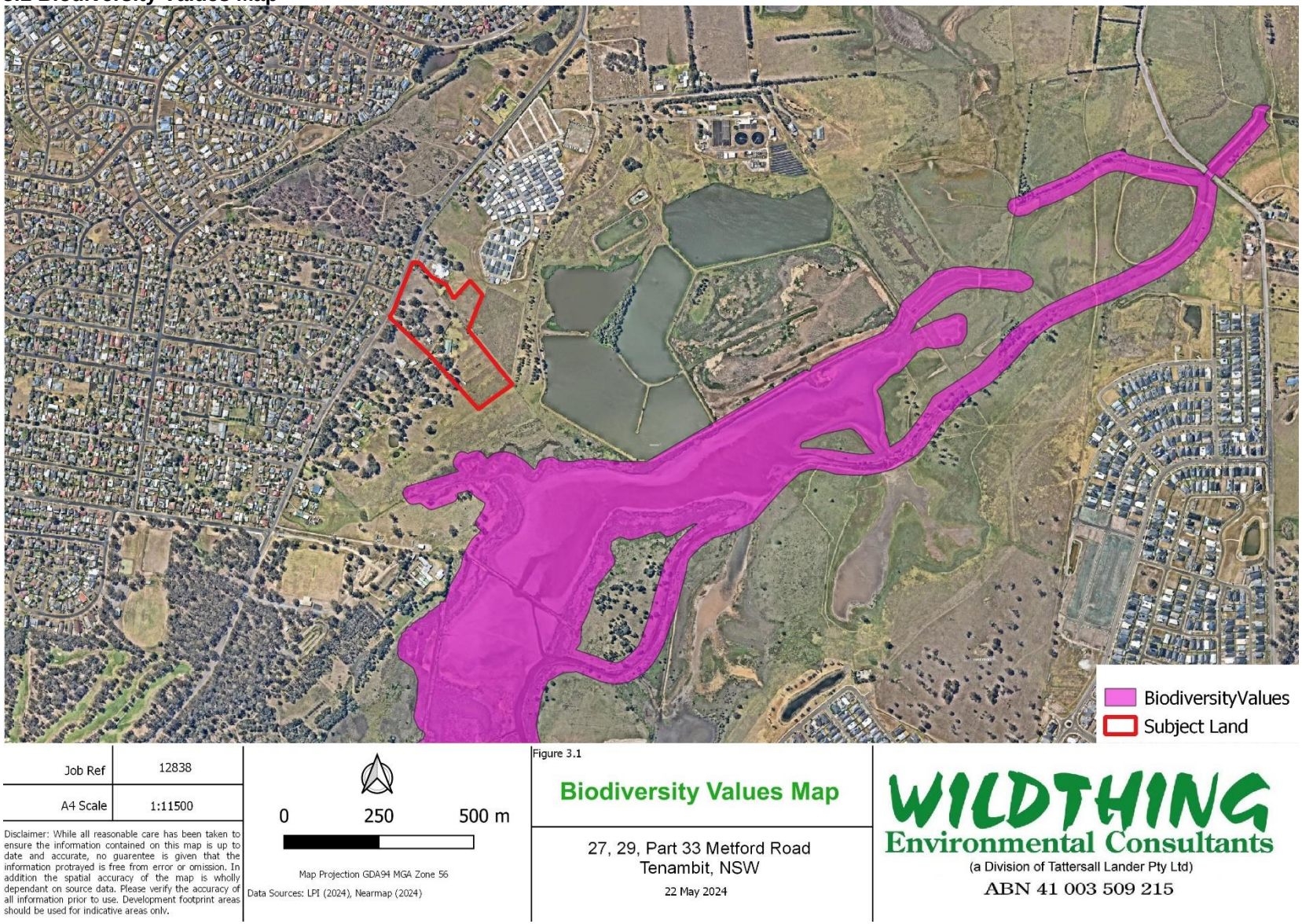
As the proposed development was not found to comply within any of the criteria it was determined that a BDAR and entry into the BOS threshold would not be applicable for this development. Thus, the survey methodology detailed in the following sections have been undertaken in accordance with the requirements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

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

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

CRITERIA FOR ENTRY INTO THE BIODIVERSITY OFFSETS SCHEME (BOS)	SECTION CRITERIA ADDRESSED	ASSESSMENT OF CRITERIA
Part 4 development activities deemed to be 'State Significant' under the NSW Environmental Planning and Assessment Act 1979 (NSW EP&A Act)		The proposal is not recognised as State Significant
Development activities that have the potential to impact Areas of Outstanding Biodiversity Value (AOBV) as listed under Part 3 of the BC Act.	Section 7.0	No declared areas of outstanding biodiversity value were located within or in proximity to the site.
Development activities that have the potential to cause a significant impact on a threatened species, population or ecological community, listed under Schedules 1 and 2 of the BC Act, as determined by application of a five-part-test of significance in accordance with Section 7.3 of the BC Act;	Section 7.0	The five-part test found no significant impact on threatened species, populations or ecological communities listed under Schedules 1 and 2 of the BC Act.
Development activities that have the potential to impact areas mapped as having 'high biodiversity value' as indicated by the NSW Biodiversity Values Map (BV Map);	Section 3.0 Figure 3.1.	The NSW Biodiversity Values Map was last consulted on the 13 February 2024. As of this date it was determined that there were areas of mapped 'Biodiversity Values' within the subject land. Consequently, the proposed development would not exceed the biodiversity offsets scheme threshold in regard to Section 7.2(b) of the BC Act. An extract of the Biodiversity Values Map has been provided in Figure 3.1.
Development activities that involve clearing of native vegetation that exceeds the Biodiversity Offset Scheme thresholds (BOS thresholds) as determined by the NSW BC regulation.	Section 6.0	The clearing threshold for the subject land is 1ha. The impact to native vegetation did not exceed 1ha. Consequently, the proposed development would not exceed the biodiversity offsets scheme threshold regarding Section 7.2(b) of the BC Act.

Figure 3.1 Biodiversity Values Map



3.3 STATE ENVIRONMENTAL PLANNING POLICY (BIODIVERSITY AND CONSERVATION) 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) consolidates transfers and repeals provisions of the following 11 SEPPs (or deemed SEPPs):

1. SEPP (Vegetation in Non-Rural Areas) 2017 (Vegetation SEPP)
2. SEPP (Koala Habitat Protection) 2020 (Koala SEPP 2020)
3. SEPP (Koala Habitat Protection) 2021 (Koala SEPP 2021)
4. Murray Regional Environmental Plan No 2—Riverine Land (Murray REP)
5. SEPP No 19—Bushland in Urban Areas (SEPP 19)
6. SEPP No 50—Canal Estate Development (SEPP 50)
7. SEPP (Sydney Drinking Water Catchment) 2011 (Sydney Drinking Water SEPP)
8. Sydney Regional Environmental Plan No 20 – Hawkesbury – Nepean River (No 2 – 1997) (Hawkesbury–Nepean River SREP)
9. Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005 (Sydney Harbour Catchment SREP)
10. Greater Metropolitan Regional Environmental Plan No 2 – Georges River Catchment (Georges River REP)
11. Willandra Lakes Regional Environmental Plan No 1 – World Heritage Property (Willandra Lakes REP).

Each consolidated SEPP now makes up a chapter in the SEPP (Biodiversity and Conservation) 2021. The subject land is located within the Port Stephens Council and is zoned as RU2. Therefore, the subject land falls under 'Chapter 3 Koala habitat protection' 2020 of the SEPP (Biodiversity and Conservation) 2021.

3.3.1 CHAPTER 3 KOALA HABITAT PROTECTION 2020

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

- by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and
- by encouraging the identification of areas of core koala habitat, and
- by encouraging the inclusion of areas of core koala habitat in environment protection zones.

This Chapter applies to land use zones RU1, RU2 and RU3 (or an equivalent land use zone) in LGAs specified in the SEPP (Biodiversity and Conservation) 2021, which includes the Maitland City Council LGA. This Chapter has been addressed in Section 8 of this report.

3.4 BIOSECURITY ACT 2015

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

3.5 COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

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

MNES categories listed under the EPBC Act are:

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

Initially MNES protected under the EPBC Act are assessed in accordance with the Significant Impact Guidelines 1.1 - Matters of National Environmental Significance (DoE 2013). This is performed to determine if there is likelihood for an action to have a significant impact on MNES. An action will require referral to, and may require the approval of, the commonwealth minister for the Environment (in addition to any local or state government consent or approval) if that action will have, or is likely to have, a significant impact on the environment or on a MNES.

3.6 LICENSING

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

4.0 METHODOLOGY

4.1 DESKTOP ASSESSMENT

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

Table 4.1: Desktop Resources

Resource	Date Reviewed	Spatial Extent
Zoning and Regulatory Maps		
Maitland Local Environmental Plan 2011	February 2024	Entire subject land
Biodiversity Values and Landscape Maps		
NSW Biodiversity Values Map (DPE 2024a)	February 2024	Entire subject land
SIX Maps -Base Map - LPI 1:25,000 digital topographic databases (DTDB) (LPI 2024) -Cadastral data LPI digital cadastral database (DCDB) (LPI 2024)	Various dates	Entire subject land
NSW SEED Mapping (NSW Gov 2024)	February 2024	Entire subject land
BioNet NSW (Mitchell) Landscapes – Version 3.1 (DPIE 2017)	February 2024	Entire subject land
NSW Interim Biogeographic Regions of Australia (IBRA region and sub-regions) – Version 7 (DAWE 2016)	February 2024	Entire subject land
Atlas of Groundwater Dependent Ecosystems (BoM 2012)	February 2024	Entire subject land
Nearmap (2024)	February 2024	
Threatened Species, Vegetation and Landscape Databases		
BioNet Atlas of NSW Wildlife (BioNet) (DPIE 2024b)	12 February 2024	10x10km radius of subject land
Commonwealth Protected Matters Search Tool (PMST) (DECCEEW 2024a)	12 February 2024	10x10km radius of subject land
Commonwealth species profiles and threats database (SPRAT) (DECCEEW 2024b)	12 February 2024	-
NSW Bionet Threatened Biodiversity Profile Data Collection (DPE 2024e)	12 February 2024	
BioNet vegetation classification database (DPE 2024c)	12 February 2024	-
PlantNet NSW (PlantNet 2024).	12 February 2024	-
Directory of Important Wetlands in Australia (DIWA) (DoE 2015)	12 February 2024	-
Geological sites of NSW (Cartoscope 2021)	12 February 2024	-
Survey and Reporting Methodology		
Biodiversity Assessment Method (BAM) (DPIE 2020a)	Various dates	-
Biodiversity Assessment Method Operational Manual – Stage 1 (DPIE 2020b)	Various dates	-
Biodiversity Assessment Method – Operational Manual – Stage 2 (DPIE 2019)	Various dates	-
Biodiversity Assessment Method – Operational Manual – Stage 3 (DPIE, 2020c)	Various dates	-
Threatened species survey and assessment guidelines: field survey methods for fauna – amphibians (DECC 2009)	Various dates	-

Resource	Date Reviewed	Spatial Extent
NSW Survey Guide for Threatened Frogs (DPIE 2020d)	Various dates	-
NSW Guide to Surveying threatened plants and their habitats (DPIE 2020e)	Various dates	-
OEH Threatened Biodiversity Survey and Assessment Guidelines. Guidelines for Developments and Activities (DEC 2004)	Various dates	-
Biodiversity Assessment Method Credit Calculator (BAM-CC) (DPIE 2022f)	8 January 2024	-
Plans		
HDB Town Planning and Design (2024) Preliminary development plan for LOT 11 DP 597659 AND LOTS 7 & 8 DP 810442 NOS 27-33 METFORD ROAD TENAMBIT 11/04/2024	May 2024	Subject Land

4.2 FIELD ASSESSMENT

Fieldwork was undertaken in January and February 2024. A summary of the time spent on site during fieldwork and the prevailing weather conditions at the time is contained in Table 4.2.

Table 4.2: Survey Dates, Times and Weather Conditions

DATE	TIME	SURVEY EFFORT (PERSON HOURS)	ACTIVITY	WEATHER
Tuesday 23/01/2024	1400– 1515	2h 30min (2 persons)	General site inspection Vegetation survey Diurnal fauna survey Tree survey Incidental observations	6/8 Cloud, 26.4°C, 50% relative humidity, Wind 24km//hr ESE
Tuesday 30/01/2024	1900 – 2130	5h (2 persons)	Hollow-bearing Tree Survey Diurnal fauna survey Incidental observations Stag Watch Survey Spotlight Survey Incidental observations	0/8 Moon, 1/8 Cloud, 28°C, 63% relative humidity, Wind 15km/h ESE
Friday 09/02/2024	0930 - 1230	6h (2 persons)	Set camera trap Incidental observations	3/8 Cloud, 22.6°C, 61% relative humidity, Wind 3.7km/hr SSW
	1930 – 2130	4h (2 persons)	Set anabat survey Stag Watch Survey Spotlight Survey Incidental observations	0/8 Moon, 8/8 Cloud, 23.8°C, 71% relative humidity, Wind 13km/hr S

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

4.2.1 VEGETATION ASSESSMENT

The initial determination of the basic vegetation community boundaries was undertaken through the review of an orthophoto covering the site. Following this, a detailed ground survey was conducted in accordance

with the Department of Environment and Conservation's (NSW) Threatened Biodiversity Survey and Assessment Guidelines – Working Draft (Department of Environment and Conservation, 2004). Flora searches were undertaken in the manner described by Cropper (1993) as the 'Random Meander Technique'. This involved walking in a random manner throughout the entire site particularly the impact area. A list of all flora species identified on site has been provided in Appendix A. All field survey tracks for both flora and fauna surveys are shown in Figure 4.1.

A Plot Based Floristic survey was undertaken to identify the most likely Plant Community Type within the subject land. The plot-based floristic vegetation survey was based on a 20m × 20m plot.
Data was collected in accordance with BAM Subsection 4.2.1 and 4.3.4 (BAM, 2020b) by persons trained in the BAM (see Section 4.3.1). The field data collected during the vegetation integrity assessment can be found in Appendix E along with photos of the BAM plot. Survey plot location was selected such that it included all functional attributes relevant to the PCT and vegetation zone. Figure 4.1 demonstrates the layout of a plot and details the survey methodology.

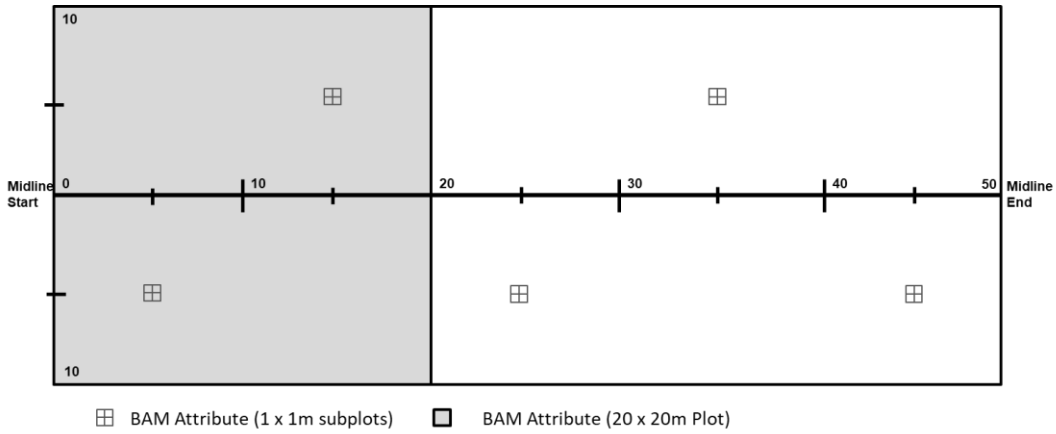


Figure 4.1: Plot Survey Design

The following site attributes were recorded at each site while conducting survey plots:

- Midline start and end points (easting – northing grid type MGA 2020, Zone 56);
- Vegetation structure and dominant species and vegetation condition.

1. Composition attributes (in 20 x 20m plot)

- All native species
- All introduced species (including high threat weeds)

2. Structure attributes (in 20 x 20m plot)

- Estimate of foliage cover of every native and introduced species recorded. Foliage cover is defined as the percentage of the plot covered by a vertical projection of all attached plant material, regardless of whether it appears alive or dead, of all individuals of a species.

3. Function attributes (in 50 x 20m plot)

- Presence or absence of each tree stem size class (diameter at breast height, over bark and measured at 1.3 metres above ground level). Classes include 5–9cm, 10–19cm, 20–29cm, 30–49cm
- Tally and DBH of large trees where DBH is between 50-79cm or equal to or above 80cm
- Tally and DBH of regenerating trees with a DBH below 5cm
- Length of all fallen logs. Fallen logs are defined as dead woody material with a diameter greater than 10cm. Where logs extend outside the plot only the length within the plot is recorded.
- Percentage cover of leave litter, bare ground, cryptograms and bare rock in each 1 x 1m plot. Litter is taken as plant material detached from a plant including leaves, seeds, twigs, branchlets and branches with diameter of <10cm.

4. Other Attributes

- Number of stems with hollows is counted in the plot (50 x 20m). A tree is considered to contain a hollow if:

- the entrance can be seen.
- the entrance width is at least 5 centimetres.
- the hollow appears to have depth (i.e., solid wood cannot be seen beyond the entrance); and
- the hollow is at least 1 metre above the ground.

General Habitat for Native Species

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

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

4.2.2 HABITAT FOR SIGNIFICANT SPECIES

The subject land area was evaluated as potential habitat for each of the threatened species reported on the BioNet (DPE, 2024a) and PMST (DCCEEW, 2024) databases from within 10km of the site. This evaluation was based on home range, feeding, roosting, breeding, movement patterns and corridor requirements for fauna and hydrology, soil types, aspect and structural formation for flora species. The list of threatened species recorded within these databases is provided within Table 4.3 and an assessment of the likelihood of occurrence of these threatened species within the subject land is provided in Table 5.3.

4.2.3 TREE SURVEY

During the fieldwork, a survey was undertaken to identify trees within the impact area. The survey also involved identifying any hollow-bearing trees or trees containing nests present. Hollow-bearing trees are a habitat resource utilised by a variety of native avifaunal and mammalian species. This resource is usually a limiting factor in the occurrence of hollow-dependent species on a site, due to the time taken for hollows to form in trees. It must be noted that observations made from ground level may fail to record a small number of hollows that are obscured. Some entrances may also not lead to a cavity. The internal dimensions of the hollows are also impossible in many cases to determine from the ground. The ground-based survey recorded the details of each significant tree including height, diameter at breast height (dbh), hand held GPS coordinates and fauna habitat attributes such as hollows. The presence of activity in the form of scratches, scats on the trunks of trees and scats around the base were also noted.

4.2.4 TERRESTRIAL FAUNA APPRAISAL METHODOLOGY

The methodology adopted consisted of an assessment of the potential use of the site by any Schedule 1 and 2 fauna identified on the DPIE and DAWE Databases. This was undertaken by both appraising the extent of likely habitat upon the site, searches for secondary indications of threatened species utilising the site, and incidental observations of native fauna in general. The survey was carried out in accordance with the

Department of Environment and Conservation's (NSW) Threatened Biodiversity Survey and Assessment Guidelines – Working Draft (Department of Environment and Conservation, 2004).

4.2.5 AMPHIBIAN SURVEY

Amphibian surveys included a combination of diurnal and nocturnal census methods. Systematic searches involved opportunistic searches within appropriate habitat for basking or sheltering individuals. Appropriate cover such as logs was turned over for resting individuals. Nocturnal surveys were undertaken in suitable habitat and involved listening for the characteristic call of male frogs. No areas of suitable surface water, flowing streams or swampy areas were present within the impact area which limited suitable habitat for several amphibian species.

4.2.6 REPTILE SURVEY

Searches for reptiles involved a combination of diurnal and nocturnal searches. Diurnal searches for reptiles involved searching in likely habitat (i.e. leaf litter, dead logs and long grass) during the morning and afternoon survey period. Nocturnal searches were conducted for reptile species active at night such as geckos and some species of snakes and involved searching in likely habitats with the aid of a spotlight.

4.2.7 DIURNAL AVIFAUNA SURVEY

The diurnal avifauna survey involved transects targeting potential habitat within the site for species such as *Daphoenositta chrysoptera* (Varied Sittella) and *Glossopsitta pusilla* (Little Lorikeet). Surveys were conducted at peak activity periods (i.e. dawn and dusk). Incidental observations and secondary indications (i.e. distinctive feathers and nests) of avifauna were also recorded. Searches for chewed cones underneath Allocasuarina trees were also conducted to determine the presence of *Calyptorhynchus lathami* (Glossy Black Cockatoos).

4.2.8 STAG WATCHING SURVEY

Arboreal mammal surveys were undertaken to target *Petaurus norfolcensis* (Squirrel Glider). Surveys included stag watching, spotlighting and camera trapping. The targeted trees contained hollows, were flowering or had scratches present on the boles. The stag watching survey involved watching hollow-bearing trees within the study area, 20 minutes prior to sunset and continuing until 20 minutes after sunset. The person was in a position to allow a good view of the tree to be obtained, preferably with the tree silhouetted against the sky. The required listening period and stag watching were undertaken concurrently. Hollow trees targeted were those suitable for Petaurus norfolcensis (Squirrel Glider). The location of the watched stag trees is shown in Figure 4.2.

4.2.9 SPOTLIGHTING SURVEY

Spotlighting was undertaken on foot using 100watt hand-held spotlights and high-powered head torches. The spotlighting involved walking at a slow pace along tracks and trails within the subject land area and stopping every 2 minutes, allowing the observer to hear movements of animals. Targeted candidate species targeted included *Petaurus norfolcensis* (Squirrel Glider). The location of the spotlighting routes within the subject land is shown in Figure 4.2.

4.2.10 CAMERA TRAPPING CAMERA SURVEY

One camera trap (Swift Enduro) was set up within the subject land between 9 February 2024 and 14 February 2024. The arboreal camera was installed at least 4m up in trees to target arboreal species, particularly *Petaurus norfolcensis* (Squirrel Glider) and *Phascogale tapoatafa* (Brush-tailed Phascogale). The camera was aimed at a bait station containing a mixture of oats, peanut butter, honey and a truffle oil mixture. A mixture of honey and water was also sprayed on the trunk of the tree. The location of the camera trap within the subject land is shown in Figure 4.2.

4.2.11 MICROCHIROPTERAN BAT CALL SURVEY

Bat echo-location calls were recorded using an Anabat Swift in areas which were considered likely to be used by bats. The position was selected to sample potential hunting sites for bats, including flyways, clearings and ecotones. Echolocation surveys used stationary surveys for 2 hours on the evening of 9 February 2024. The bat calls recorded by Wildthing Environmental Consultants were analysed in-house by Mungo Worth. The location of the Anabat Survey within the study land is shown in Figure 4.2.

4.3 SIGNIFICANT SPECIES

The following threatened species listed in Table 4.3 have been recorded on the BioNet (DPE, 2024a) and PMST (DCCEEW, 2023a) Databases as occurring within 10km of the subject land. Species marked with an asterisk (*) are listed on the DCCEEW Database as having habitat likely to occur within 10km of the subject land. Pelagic species were not included in the list due to the absence of habitat.

Figure 4.1 Camera Trap and Anabat Survey Locations

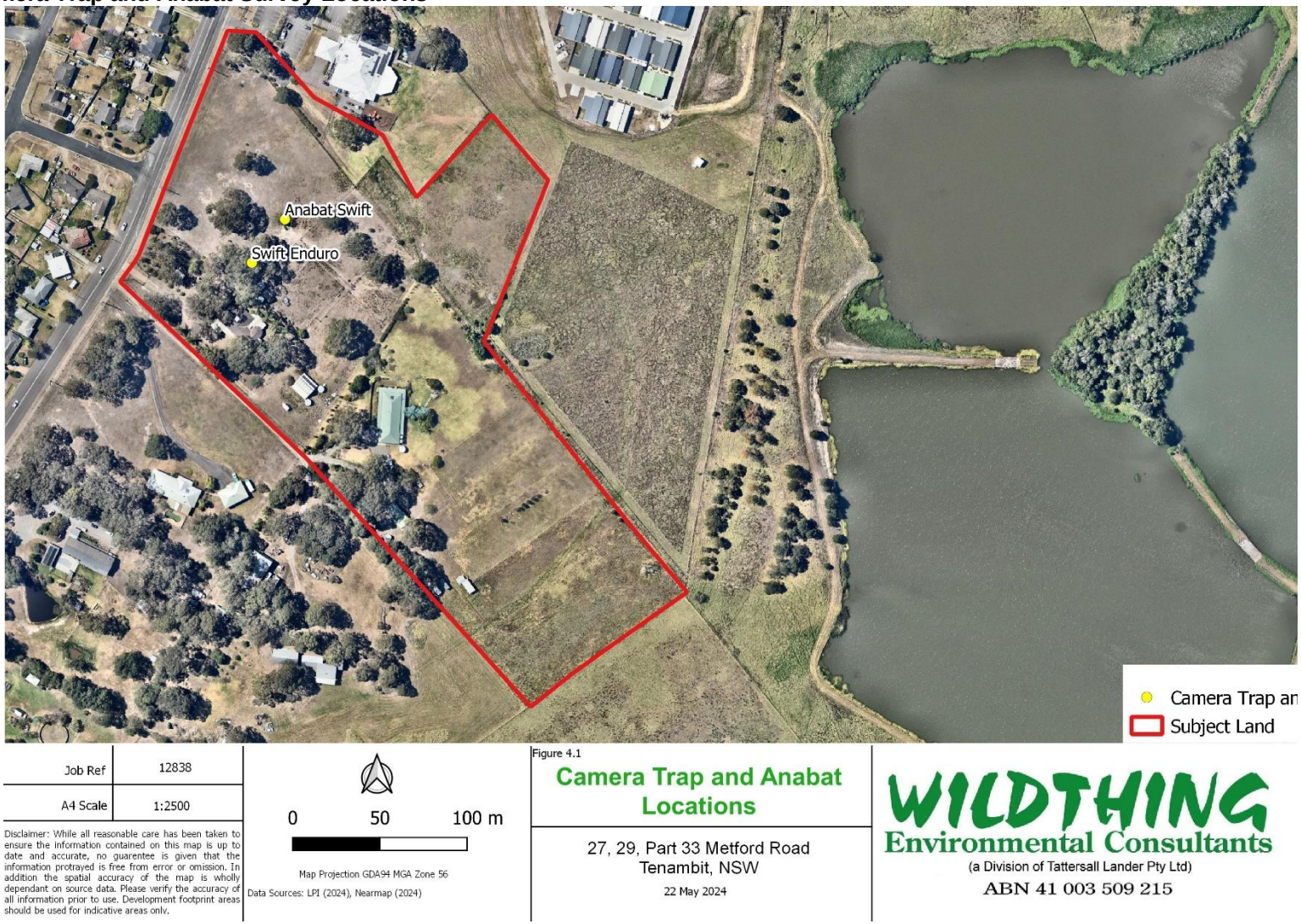


Table 4.3: Threatened species, endangered populations and ecological communities considered.

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
Flora Species			
**Caladenia tessellata*	Thick-lipped Spider-orchid	E1	V
**Cryptostylis hunteriana*	Leafless Tongue Orchid	V	V
**Prasophyllum* sp. *Wybong*	A Leek Orchid		CE
Pterostylis chaetophora	Tall Rustyhood	V	V
Pterostylis gibbosa	Illawarra Greenhood	E1	E
**Rhizanthella slateri*	Eastern Underground Orchid	V	E
**Arthraxon hispidus*	Hairy-joint Grass	V	V
**Dichanthium setosum*	Bluegrass	V	V
**Cynanchum elegans*	White-flowered Wax Plant	E1	E
**Rutidosis heterogama*	Heath Wrinklewort	V	V
**Tetratheca juncea*	Black-eyed Susan	V	V
**Acacia bynoeana*	Bynoe's Wattle	E1	V
**Angophora inopina*	Charmhaven Apple	V	V
Eucalyptus glaucina	Slaty Red Gum	V	V
**Eucalyptus parramattensis* subsp. *decadens*	Drooping Red Gum	V	V
Rhodamnia rubescens	Scrub Turpentine	E4A	CE
Rhodomyrtus psidioides	Native Guava	E4A	CE
**Syzygium paniculatum*	Magenta Lilly Pilly	E1	V
**Euphrasia arguta*		E4A	CE
**Persicaria elatior*	Tall Knotweed	V	V
**Grevillea parviflora* subsp. *parviflora*	Small-flowered Grevillea	V	V
**Commersonia prostrata*	Dwarf Kerrawang	E1	E
**Pomaderris brunnea*	Brown Pomaderris	E1	V
**Asperula asthenes*	Trailing Woodruff	V	V
**Thesium australe*	Austral Toadflax	V	V
Amphibians			
Litoria aurea	Green and Golden Bell Frog	E1	V
**Mixophyes balbus*	Stuttering Frog	E1	V
**Mixophyes iteratus*	Giant Barred Frog	V	V
Reptiles			
**Aprasia parapulchella*	Pink-tailed Worm-lizard	V	V
**Delma impar*	Striped Legless Lizard	V	V
Birds			
**Actitis hypoleucos*	Common Sandpiper		M
Calidris acuminata	Sharp-tailed Sandpiper		M
Calidris ferruginea	Curlew Sandpiper	E1	CE & M
Calidris melanotos	Pectoral Sandpiper		M
Xenus cinereus	Terek Sandpiper		V
Gallinago hardwickii	Latham's Snipe		M
**Limosa lapponica*	Bar-tailed Godwit		M
**Limicola falcinellus*	Broad-billed Sandpiper	V	M
**Numenius madagascariensis*	Eastern Curlew		CE & M
**Tringa nebularia*	Common Greenshank		M
**Tringa stagnatilis*	Marsh Sandpiper		M
**Charadrius leschenaultii*	Greater Sand-plover	V	V & M
**Charadrius mongolus*	Lesser Sand Plover	V	E
Rostratula australis	Australian Painted Snipe	E1	E
Cuculus optatus	Oriental Cuckoo		M
**Botaurus poiciloptilus*	Australian Bittern	E1	
Ephippiorhynchus asiaticus	Black-necked Stork	E1	
Anseranas semipalmata	Magpie Goose	V	
Oxyura australis	Blue-billed Duck	V	

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
Stictonetta naevosa	Freckled Duck	V	
Apus pacificus	Fork-tailed Swift		M
Irediparra gallinacea	Comb-crested Jacana	V	
**Sternula nereis nereis*	Australian Fairy Tern		V
Ptilinopus magnificus	Wompoo Fruit-Dove	V	
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	V
**Callocephalon fimbriatum*	Gang Gang Cockatoo	V	E
Lathamus discolor	Swift Parrot	E1	CE
**Neophema chrysostoma*	Blue-winged Parrot		V
Glossopsitta pusilla	Little Lorikeet	V	
Hirundapus caudacutus	White-throated Needletail		V & M
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	
**Monarcha melanopsis*	Black-faced Monarch		M
**Symposiachrus trivirgatus as Monarcha trivirgatus*	Spectacled Monarch		M
**Pycnoptilus floccosus*	Pilotbird		V
Epthianura albifrons	White-fronted Chat	V	
**Melanodryas cucullata cucullata*	Hooded Robin	V	
**Myiagra cyanoleuca*	Satin Flycatcher		M
**Rhipidura rufifrons*	Rufous Fantail		M
Climacteris picumnus victoriae	Brown Treecreeper	V	V
**Stagonopleura guttata*	Diamond Firetail	V	V
**Motacilla flava*	Yellow Wagtail		M
Pomatostomus temporalis subsp. *temporalis*	Grey-crowned Babbler	V	
Anthochaera phrygia	Regent Honeyeater	E4A	CE
**Grantiella picta*	Painted Honeyeater	V	V
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	
Daphoenositta chrysoptera	Varied Sittella	V	
Circus assimilis	Spotted Harrier	V	
Pandion cristatus	Eastern Osprey	V	M
Lophoictinia isura	Square-tailed Kite	V	
**Erythrotriorchis radiatus*	Red Goshawk	E4A	V
Hieraaetus morphnoides	Little Eagle	V	
Haliaeetus leucogaster	White-bellied Sea Eagle	V	
**Falco hypoleucos*	Grey Falcon	E1	V
Falco subniger	Black Falcon	V	
Ninox connivens	Barking Owl	V	
Ninox strenua	Powerful Owl	V	
Tyto novaehollandiae	Masked Owl	V	
Mammals			
Dasyurus maculatus maculatus	Spotted-tailed Quoll	V	E
Phascogale tapoatafa	Brush-tailed Phascogale	V	
Phascolarctos cinereus	Koala	E1	E
**Petrogale penicillata*	Brush-tailed Rock-wallaby	E	V
**Macropus parma*	Parma Wallaby	V	V
**Potorous tridactylus tridactylus*	Long-nosed Potoroo	V	V
**Petaurus australis*	Yellow-bellied Glider	V	V
Petaurus norfolcensis	Squirrel Glider	V	
**Petauroides volans*	Greater Glider	E	E
**Pseudomys novaehollandiae*	New Holland Mouse		V
Pteropus poliocephalus	Grey-headed Flying-fox	V	V
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	

Scientific Name	Common Name	BC Act 2016	EPBC Act 1999
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	
Miniopterus australis	Little Bentwing-bat	V	
Miniopterus orianae oceanensis	Large Bentwing-bat	V	
Myotis macropus	Southern Myotis	V	
Scoteanax rueppellii	Greater Broad-nosed Bat	V	
Vespadelus troughtoni	Eastern Cave Bat	V	
Chalinolobus dwyeri	Large Pied Bat	V	V
Populations			
Cymbidium canaliculatum population in the Hunter Catchment		E2	
Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area		E2	
Endangered Ecological Communities			
Central Hunter Grey Box—Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions		E3	
Central Hunter Ironbark—Spotted Gum—Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions		E3	
Central Hunter Valley eucalypt forest and woodland			CE
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community			E
Coastal Upland Swamp in the Sydney Basin Bioregion		E3	
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions		E3	
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions		E3	
Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion		V2	
Hunter Valley Vine Thicket in the NSW North Coast and Sydney Basin Bioregions		E3	
Hunter Valley Weeping Myall (Acacia pendula) Woodland			CE
Hunter Valley Weeping Myall Woodland in the Sydney Basin Bioregion		E4B	
Kurri Sand Swamp Woodland in the Sydney Basin Bioregion		E3	
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions		E3	
Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions		V2	
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions		E3	
Lowland Rainforest of Subtropical Australia			CE
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria			CE
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E3	
Sydney Freshwater Wetlands in the Sydney Basin Bioregion		E3	
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and		E4B	
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland			CE
Central Hunter Valley eucalypt forest and woodland			CE
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community			E

E1/E=Endangered Species E2=Endangered Population E3=Endangered Ecological Community
V=Vulnerable Species V2= Vulnerable Ecological Community E4A/E4B/CE=Critically Endangered
M=Migratory Species

5.0 RESULTS

5.1 FLORA ASSEMBLAGES

The subject land has been subject to past historic native vegetation clearance and prolonged grazing by livestock. A large remnant patch of woodland containing native canopy species and groundcovers was also present. This vegetation was also present within the riparian zone of the creeklines. The vegetation of the study area was stratified by assigning the vegetation to Plant Community Types (PCTs) detailed in the NSW Vegetation Information System (VIS) classification database, the following PCTs were present within the study area:

- PCT 3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest (0.51ha);
- Couch grassland (1.47ha);
- Exotic groundcover and planted gardens (3.15ha);
- Managed Roadside Grassland (0.06ha).

A comprehensive description of the vegetation communities present within the subject land is provided within Tables 5.1 - 5.4. A vegetation map of the study area is shown in Figure 5.1. A full list of the flora species recorded during the fieldwork is listed in Appendix A.

Table 5.1: Details of PCT 3433 within the subject land.

Plant Community Type (PCT) •	PCT 3433 – •Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest
PCT No.	PCT 3433
PCT Name	Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest
Vegetation Formation	Dry Sclerophyll Forests (Shrub/grass sub-formation)
Vegetation Class	Hunter-Macleay Dry Sclerophyll Forests
Area to be removed for proposal	0.51ha
Vegetation Description within the subject land.	Vegetation within the subject land was found to be in disturbed condition. *Corymbia maculata* (Spotted Gum) was the most common canopy species. Other canopy species included *Eucalyptus siderophloia* (Grey Ironbark), an individual specimen of *Eucalyptus tereticornis* (Forest Red Gum) that was observed near the access driveway for the western dwelling within the subject land and a planted *Eucalyptus robusta* (Swamp Mahogany). The mid-storey was absent and shrub layer was sparse and contained non-native species including the noxious weeds *Cestrum parqui* (Green Cestrum) in abundant patches, *Tecoma stans* (Yellow Bells), and *Lantana camara* (Lantana) in small numbers. Common native groundcovers included *Dichondra repens* (Kidney Weed), *Asperula conferta* (Common Woodruff), and *Glycine clandestina*. The groundcover was heavily dominated by non-native species including *Ehrharta erecta* (Panic Veldtgrass), *Phyllanthus tenellus* (Hen and Chicken), *Sida rhombifolia* (Paddys Lucerne), *Plantago lanceolata* (Lamb's tongues), and *Senecio madagascariensis* (Fireweed). Large coverings of *Cynadon dactylon* (Couch) was also observed.
TEC Status	As a result of the presence of *Eucalyptus fibrosa* (Red Ironbark) within adjacent vegetation and being located within the Sydney Basin bioregion, vegetation within the subject land was found to be consistent with the Endangered Ecological Community - Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions
Examples of PCT 3433 within the study area (Plates 1 - 10).	

Plant Community Type (PCT) •	PCT 3433 – •Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest

Plate 1: PCT 3433 within the subject land.

Plate 2: PCT 3433 within the impact area to the north of the dwelling within Lot 8.

Plant Community Type (PCT) • PCT 3433 – •Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest

Plate 3: PCT 3433 within the proposed imp[act area.

Plate 4: PCT 3433 within the proposed impact area facing Metford Road.

Plant Community Type (PCT) • PCT 3433 – •Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest

Plate 5: PCT 3433 within the subject land, facing the Regal Inn

Plate 6: PCT 3433 within the northeast of Lot 8.

Plant Community Type (PCT) • PCT 3433 – •Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest

Plate 7: PCT 3433 within the northeast of Lot 8 facing a pre-existing Manufactured Housing Estate.

Plate 8: PCT 3433 within Lot 8 facing the Regal Inn

Plant Community Type (PCT) • PCT 3433 – •Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest

Plate 9: PCT 3433 within the rear of the pre-existing dwelling within Lot 7.

Plate 10: PCT 3433 to the south of the pre-existing dwelling within Lot 7.

Table 5.2: Details of Couch Grassland within the subject land.

Plant Community Type (PCT) • Couch Grassland	
PCT No.	n/a
PCT Name	n/a
Vegetation Formation	n/a
Vegetation Class	n/a
Area to be removed for proposal	1.47ha.
Vegetation Description within the subject land.	*Cynadon dactylon* (Couch).
TEC Status	This vegetation is not consistednt with any listed TECs

Examples of Couch Grassland within the subject land (Plates 11 - 15).

Plate 11: Couch Grassland present within the west of the subject land boardering Metford Road reserve.

Plant Community Type (PCT) • Couch Grassland

Plate 12: Patches of Couch Grassland within the subject land.

Plate 13: Couch Grassland within Lot 11 of the subject land.

Plant Community Type (PCT) • Couch Grassland

Plate 14: Couch Grassland within Lot 11 of the subject land facing south.

Plate 15: Couch Grassland within Lot 7 of the subject land.

Table 5.3: Exotic Groundcover with Planted Gardens

Grazed Exotic Groundcover with Scattered Trees	
PCT No.	NA
PCT Name	NA
Vegetation Formation	NA
Vegetation Class	NA
Area to be removed for proposal	3.15ha
Vegetation Description within the subject land.	Vegetation in this community consisted of largely exotic low grazed groundcover with planted gardens. The groundcover was heavily dominated by non-native species including *Ehrharta erecta* (Panic Veldtgrass), *Sporobolus africanus* (Parramatta Grass), *Plantago lanceolata* (Lamb's tongues), and *Senecio madagascariensis* (Fireweed).
TEC Status	Vegetation present on site was not consistent with a TEC

Examples of Exotic Groundcover with Palnted Gardens within the study area (Plates 16 - 20).

Plate 16: Exotic Groundcover with Planted Gardens within the east of the subject land. This grassland was heavily dominated by *Plantago lanceolata* (Lambs Tongues)

Grazed Exotic Groundcover with Scattered Trees

Plate 17: Exotic Groundcover with Planted Vegetation within Lot 7.

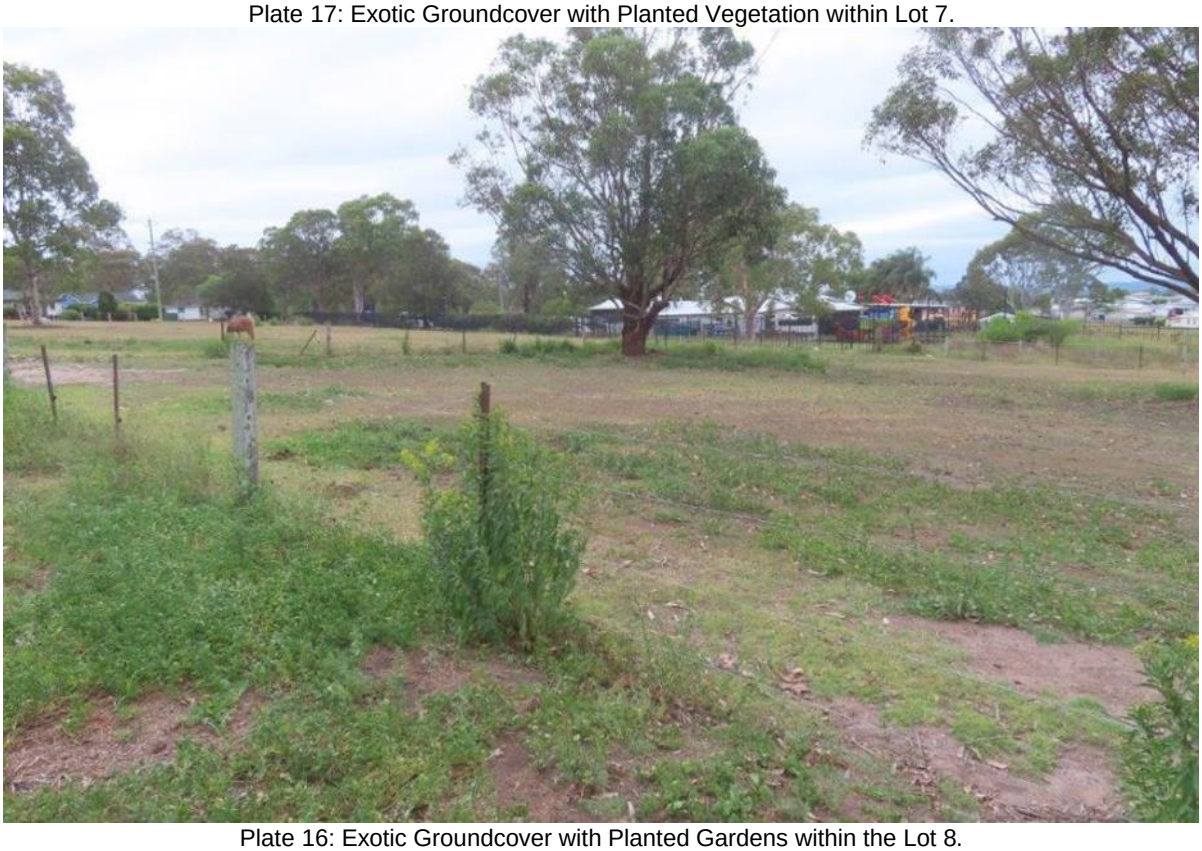


Plate 16: Exotic Groundcover with Planted Gardens within the Lot 8.

Grazed Exotic Groundcover with Scattered Trees

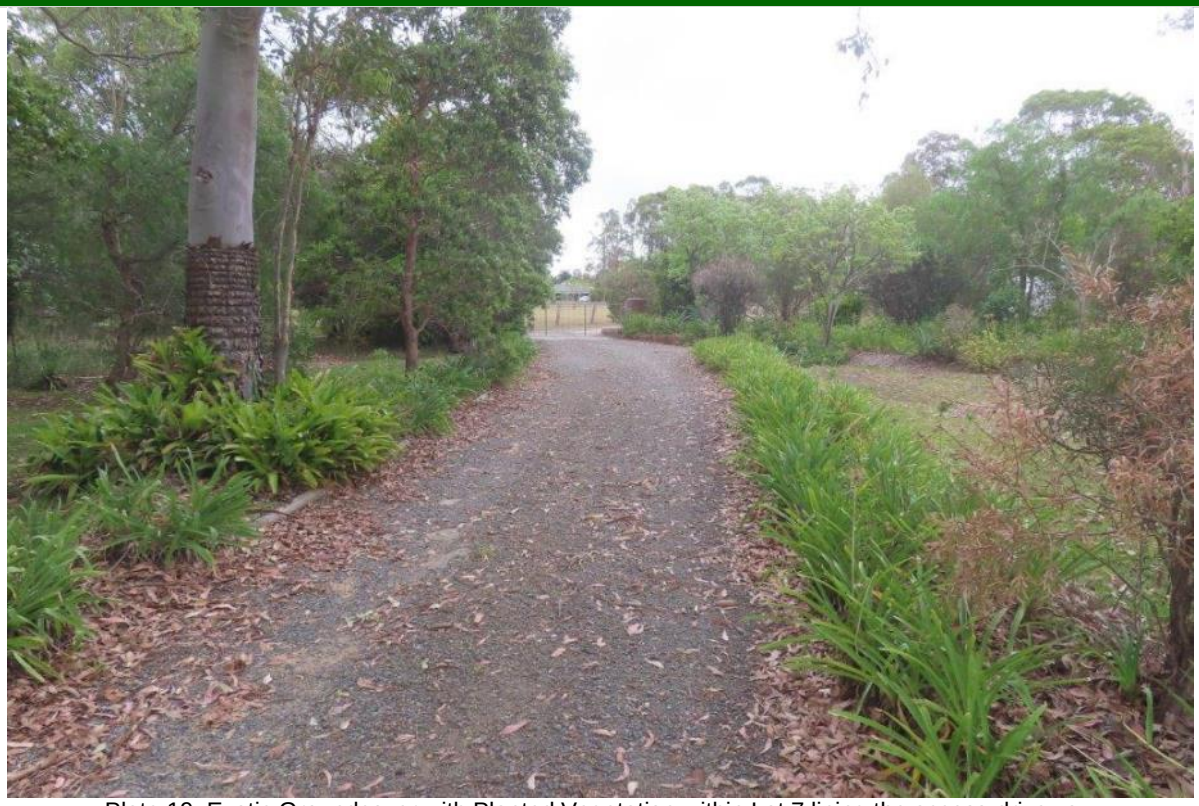


Plate 19: Exotic Groundcover with Planted Vegetation within Lot 7 lining the access driveway.

Plate 20: Exotic Groundcover with Planted Vegetation within Lot 8 near the pre-existing dwelling.

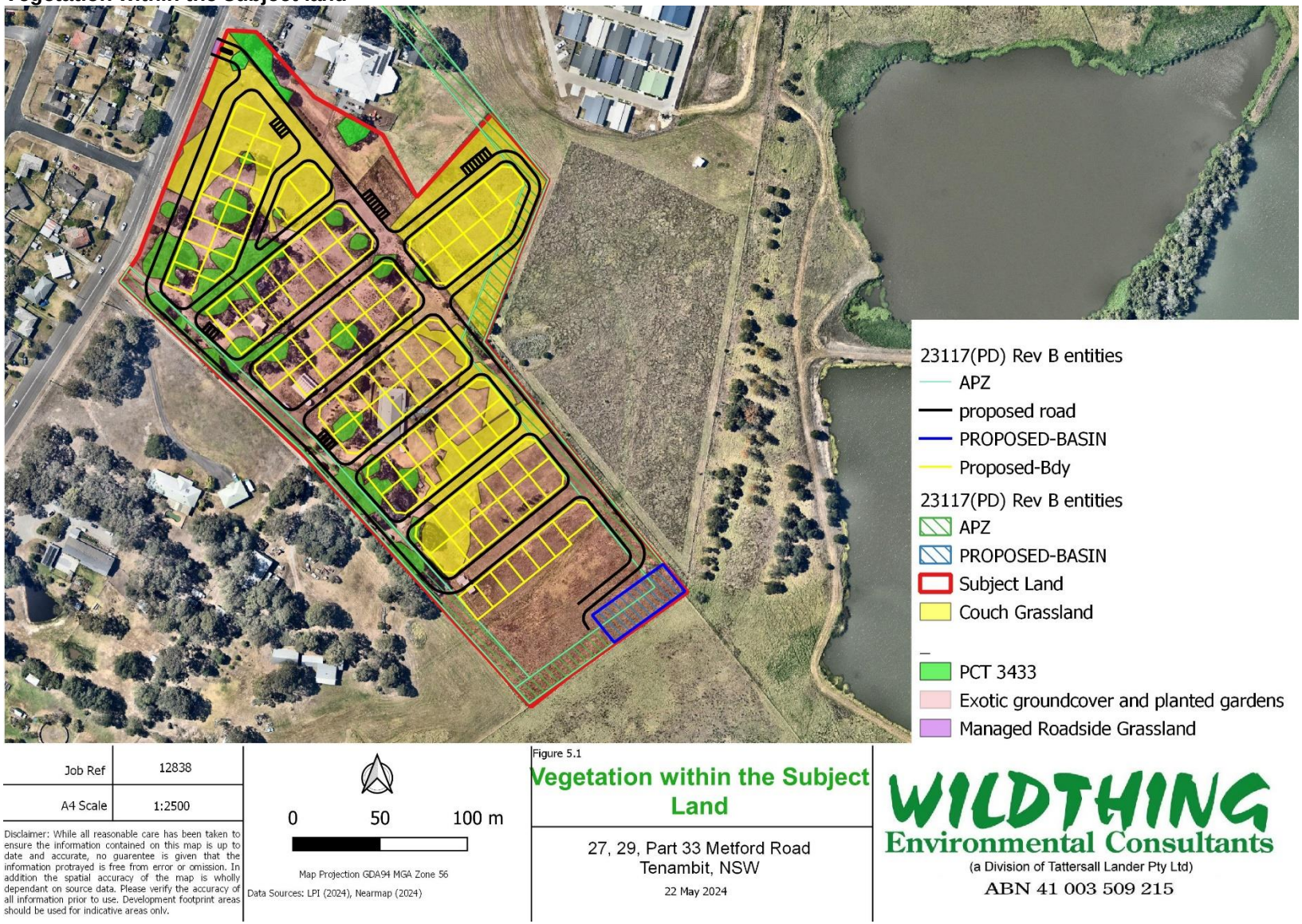
Table 5.4: Managed Roadside Grassland

Managed Roadside Grassland	
PCT No.	NA
PCT Name	NA
Vegetation Formation	NA
Vegetation Class	NA
Area to be removed for proposal	Up to 0.004ha
Vegetation Description within the subject land.	Vegetation in this community consisted of maintained roadside grassland. The groundcover was heavily dominated by non-native species including *Chloris gayana* (Rhodes Grass), *Paspalum dilatatum* (Paspalum), *Ehrharta erecta* (Panic Veldtgrass), *Sporobolus africanus* (Parramatta Grass), *Plantago lanceolata* (Lamb's tongues), *Taraxacum officinale* (Dandelion) and *Senecio madagascariensis* (Fireweed).
TEC Status	Vegetation present on site was not consistent with a TEC

Examples of Managed Roadside Grassland within the subject land (Plates 21).

Plate 21: Managed roadside grassland in the road reserve of Metford Road.

Figure 5.1 Vegetation within the subject land



5.1.1 THREATENED ECOLOGICAL COMMUNITIES

Twenty-eight threatened ecological communities (TECs) have been recorded within the region according to both the BioNet (DPE, 2024) and PMST databases, results of the database search conducted for TECs are shown within Table 4.3. PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest within the subject land was found to be consistent with the TEC Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions due to the presence of neighbouring *Eucalyptus fibrosa* (Red Ironbark) and being located within the Sydney Basin bioregion. The impact of the proposal on the TEC Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions has been addressed in Sections 6 & 7 of this report.

5.1.2 ENDANGERED POPULATIONS

No endangered populations were recorded within the subject land.

5.1.3 THREATENED AND RARE FLORA SPECIES

Twenty-five threatened plant species have been recorded within 10km of the subject land according to the BioNet database (DPE, 2023) or are considered to have suitable habitat on the PMST database. The results of the database search conducted for threatened flora species is shown within Table 4.3.

Of the addressed threatened fauna species, the most likely species to be present within the subject land were *Pterostylis chaetophora*; *Rhizanthella slateri, Rutidosis heterogama*, *Eucalyptus glaucina*; and *Grevillea parviflora subsp. parviflora.* Of these species *P. chaetophora* and *E. glaucina* would be most likely to be present on site. None of these species were observed within the site despite targeted searches. No suitable habitat is considered to be available for the remaining species. The impact of the proposal on threatened flora species has been addressed in Section 7.0 of this report.

5.1.4 PRIORITY WEEDS AND WEEDS OF STATE AND NATIONAL SIGNIFICANCE

Seven priority weed species listed under the Biosecurity Act 2015 were identified on site and are listed below in Table 5.5. The site lies within the Hunter Regional Weed Committee (HRWC).

Table 5.4: Priority Weed species found within the subject land.

WEED SPECIES	LEGAL REQUIREMENTS	ADDITIONAL SIGNIFICANCE
Senecio madagascariensis Fireweed	General Biosecurity Duty Regional Recommended Measure	N
Lantana camara Lantana	General Biosecurity Duty Prohibition on certain dealings	T, N
Cestrum parqui Green Cestrum	General Biosecurity Duty Regional Recommended Measure	
Tecoma stans Yellow Bells	General Biosecurity Duty Regional Recommended Measure	
Asparagus aethiopicus Ground Asparagus	General Biosecurity Duty Prohibition on certain dealings	
Olea europaea subsp. cuspidata African Olive	General Biosecurity Duty Regional Recommended Measure	T, N
Ligustrum sinense Narrow-leaf Privet	General Biosecurity Duty	

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

***Priorities under the Biosecurity Act 2015**

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

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

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

It is recommended that priority and other invasive weeds are removed as part of the development.

5.2 HABITAT APPRASIAL

5.2.1 HABITAT DESCRIPTION AND DISTRIBUTION IN THE VICINITY

The vegetation and landforms present within the subject land offer potential habitat for a number of native species. The broad habitat types within the subject land consisted of Dry Sclerophyll Woodland, Maintained Grassland and Planted Vegetation. A detailed description of the habitat value of each broad habitat type has been provided below.

<u>Dry Sclerophyll Woodland Habitat</u>

Dry Sclerophyll Woodland would provide suitable habitat opportunities for a variety of species. Frugivorous, nectivorous, granivorous and insectivorous birds and microchiropteran bat species would all find potential foraging resources within this complex. Hollow-bearing trees would provide nesting and roosting sites for a variety of avifauna and other hollow dependant species such as arboreal mammals and tree-roosting bats. Hunting opportunities exist for birds of prey, given that the variable tree coverage and understorey vegetation has created a myriad of ecotones and habitat densities. Such habitat is suitable for terrestrial species including small and medium sized mammals, macropods, reptiles and potentially for some frog species adapted to drier areas.

<u>Maintained Grassland Habitat</u>

Maintained groundcover would only provide habitat for a small number of species such as granivorous and insectivorous birds and microchiropteran bat species would find potential foraging resources as part of a

larger home range. Maintained Grassland running alongside Metford Road and the pre-existing internal roadway was primarily composed of low maintain groundcovers. Such habitat provides a limited habitat for a number of avifauna species, including predominantly terrestrial species preferring open spaces, seed eating birds and several birds of prey, which may hunt over this area in search of potential prey species. Macropods may also frequent such areas whilst grazing. Some species of bats may also forage over this cleared area for insects. The scarcity of trees and shrubs along with the close proximity of a road often limits the value of such areas for many species, particularly some reptiles, small mammals and birds which are vulnerable to vehicle strike predation in open spaces.

Planted Vegetation

Planted vegetation on site would offer potential foraging and nesting habitat for several avifauna species. Nectivorous species would find seasonal foraging resources, in the form of a small number of flowering myrtaceous species. The presence of flowering myrtaceous species and a small number of fig trees and Cocus Palms would offer potential seasonal foraging habitat for Flying Foxes.

5.2.2 TREE SURVEY

A total of 76 native trees were recorded within the impact area and 75 will require removal. A total of four trees were found to contain hollows (Plates 21-23). The proposal will require the removal of all hollow-bearing trees. It is recommended that tree removal be avoided wherever possible. Details of each of the surveyed trees including height, diameter at breast height (DBH), coordinates and fauna habitat attributes such as hollows are contained in Appendix C. The location of the trees are shown in Figure 5.2.

Plate 21: Hollow-bearing Tree No. 1.

Plate 22: Hollow-bearing Tree No. 2 in the left side of the photo.

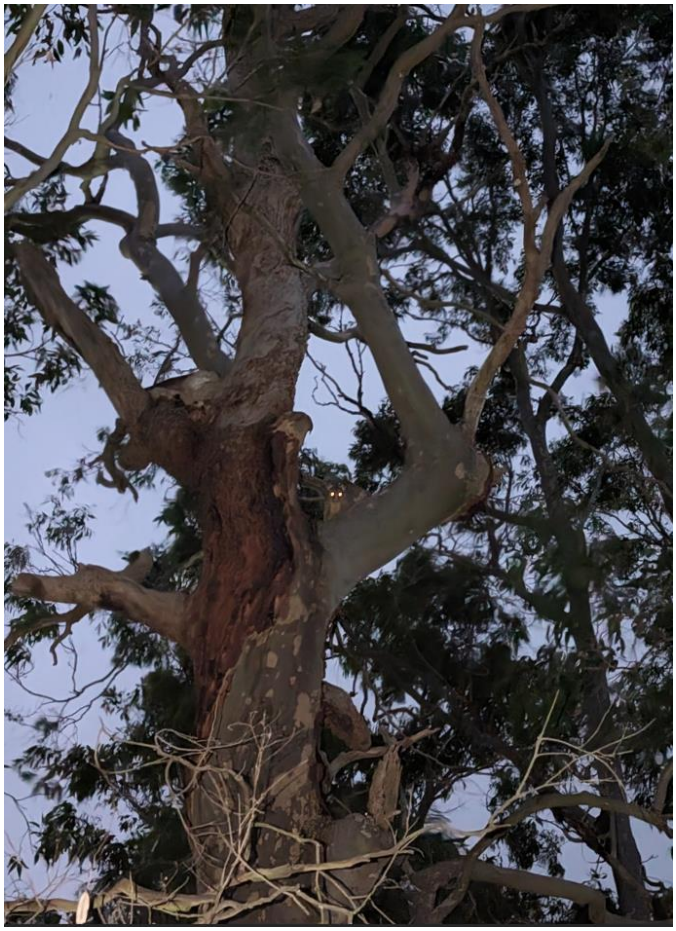
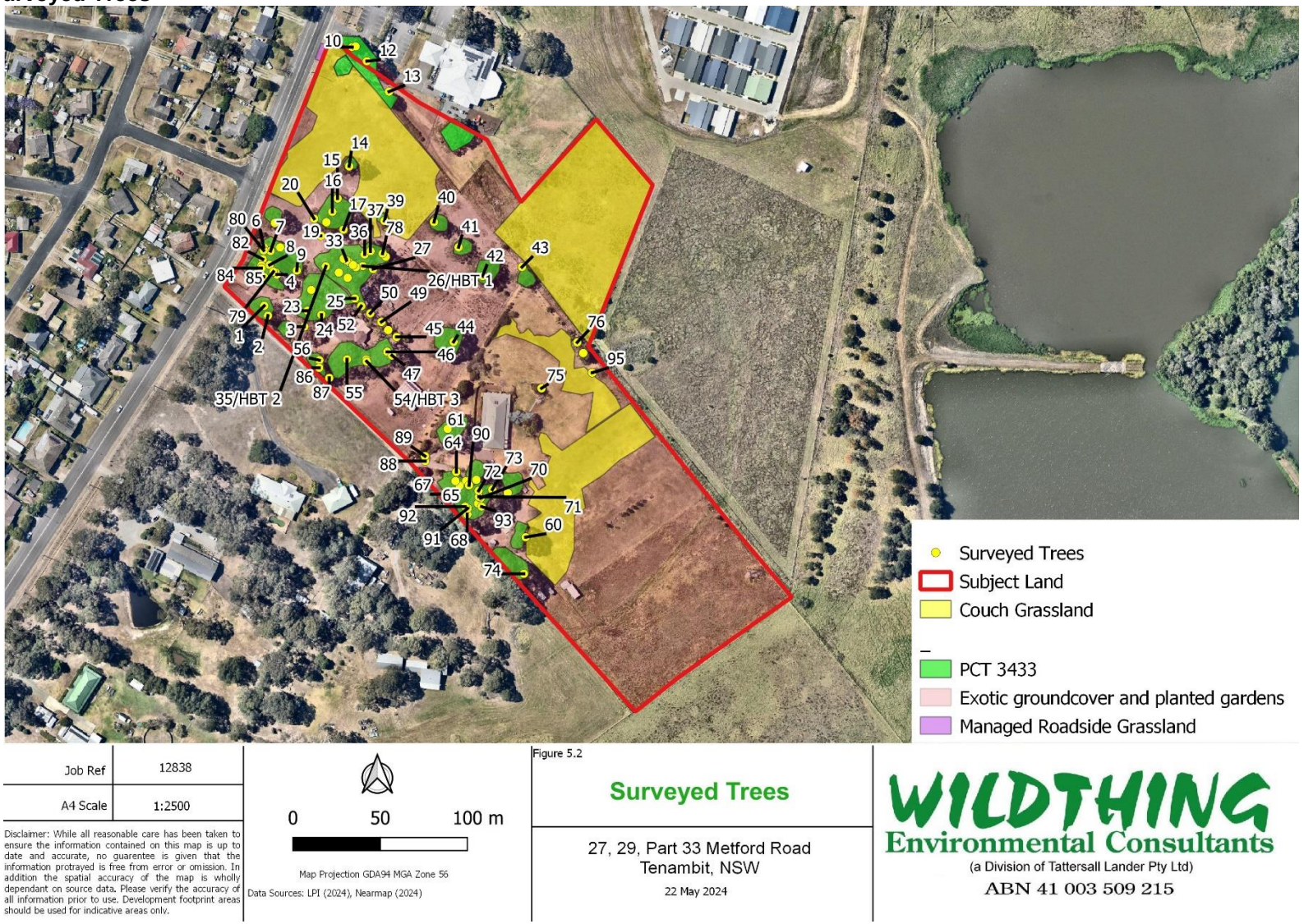


Plate 23: Hollow-bearing Tree No. 3 in the foreground and Hollow-bearing Tree No. 4.

Figure 5.2 Surveyed Trees



5.3 HABITAT FOR SIGNIFICANT SPECIES

An assessment of habitat attributes on site has been undertaken for the significant species listed in Table 4.3. This includes an Assessment of the Planted Vegetation. The results of the assessment using definitions shown in Table 5.4 are displayed in Table 5.5. Threatened species identified in this assessment as having potential habitat available on site have been considered further in Section 7.0 of this report.

Table 5.4: Definitions of likelihood of occurrence criteria.

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

Table 5.5: Habitat Assessment for Significant Species (Oceanic fauna have been removed from assessment).

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
FLORA					
Caladenia tessellata Thick-lipped Spider-orchid	E1	V	Yes	Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. Is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW.	**Unlikely** Suitable habitat was unlikely to be present within the site. No known records within the vicinity of the site.
Cryptostylis hunteriana Leafless Tongue Orchid	V	V	No	Grows in swamp-heath on sandy soils, chiefly in coastal districts, south from the Gibraltar Range. It is known historically from several localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra (although it is uncommon at all sites). Also recorded at Munmorah State Conservation Area, Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park and Ben Boyd National Park.	**Unlikely** Suitable habitat was unlikely to be present within the site. No known records within the vicinity of the site.
Prasophyllum sp. Wybong A Leek Orchid		CE	Yes	Leek orchids are generally found in shrubby and grassy habitats in dry to wet soil (Jones 2006). Known to occur in open eucalypt woodland and grassland.	**Unlikely** Suitable habitat was unlikely to be present within the site. No known records within the vicinity of the site.
Pterostylis chaetophora Tall Rustyhood	V		No	The preferred habitat is seasonally moist, dry sclerophyll forest with a grass and shrub understorey. The most commonly observed habitat is vegetation characterised by grassy open forests or derived native grasslands of Eucalyptus amplifolia and Eucalyptus moluccana on gentle flats, or that are dominated by Corymbia maculata with any of Eucalyptus fibrosa, Eucalyptus siderophloia or Eucalyptus crebra.	**Low - Moderate** Suitable habitat was present within the subject land as is known to occur within similar vegetation along Italia Road and at Wilton Drive. However, groundcovers were heavily grazed and maintained.
Pterostylis gibbosa Illawarra Greenhood	E1	E	No	All known sub-populations occur in open forest and woodland on flat or gently sloping land with poorly drained soils. Within the Hunter Valley this orchid species is confined to the Milbrodale area.	**Unlikely** The site lacks preferred vegetation associations. No known local records.
Rhizanthella slateri Eastern Underground Orchid	V	E1	Yes	Occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Grows in sclerophyll forest in shallow to deep loams.	**Low** Marginal habitat was present. No nearby records.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
Arthraxon hispidus Hairy-joint Grass				Occurs over a wide area in south-east Queensland, and on the northern tablelands and north coast of NSW, but is never common. Also found from Japan to central Eurasia. Moisture and shade-loving grass, found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps.	**Unlikely** Suitable habitat was unlikely to be present within the site. No known records within the vicinity of the site.
Dichanthium setosum Bluegrass	V	V	No	Occurs on the New England Tablelands, Northwest Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland. Associated with heavy basaltic black soils and red-brown loams with clay subsoil.	**Unlikely** Suitable habitat was unlikely to be present within the site. No known records within the vicinity of the site.
Cynanchum elegans White-flowered Wax Plant	E1	E	No	This species occurs in scattered coastal localities from the QLD-NSW border south to Wollongong. Found in dry, littoral or subtropical rainforest, and occasionally in scrub and woodland from sea level to about 600m ASL.	**Unlikely** No suitable habitat was present.
Rutidosis heterogama Heath Wrinklewort	V	V	No	Grows in heath on sandy soils and moist areas in open forest and has been recorded along disturbed roadsides. Recorded from near Cessnock to Kurri Kurri with an outlying occurrence at Howes Valley. On the Central Coast it is located north from Wyong to Newcastle.	**Low** Marginal suitable habitat was present within the subject land.
Tetratheca juncea Black-eyed Susan	V	V	No	Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the local government areas of Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock. Found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest.	**Unlikely** The site lacks common flora associations. No known nearby records.
Acacia bynoeana Bynoe's Wattle	E	V		It is found in open and sometimes slightly disturbed sites (Benson & Mc Dougall 1996) such as trail margins, edges of roadsides, grading spoil mounds and in recently burnt patches (S. Douglas pers. comm. in NSW NPWS 1999ah). The ridge-top habitat has been lost through residential development (Benson & McDougall 1991).	**Unlikely** The site lacks common flora associations. No known nearby records.
Angophora inopina Charmhaven Apple	V	V	No	Endemic to the Central Coast region of NSW. The known northern limit is near Karuah where a disjunct population occurs; to the south populations extend from Toronto to Charmhaven with the main population occurring between Charmhaven and Morisset. There is an unconfirmed record of the species near Bulahdelah. Approximately 1250 ha of occupied habitat has been mapped in the Wyong–southern Lake Macquarie area. Grows in open woodland with a dense shrub understorey on deep white sandy soils over sandstone.	**Unlikely** No suitable habitat was present.
Eucalyptus glaucina Slaty Red Gum	V	V	No	Grows in grassy woodland and dry eucalypt forest, usually on deep, moderately fertile and well-watered soils. This species has only been recorded on the north coast of NSW and in small populations from Taree to Broke and west of Maitland.	**Low - Moderate**

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
					Suitable habitat was present and known to occur within 10km of subject land.
Eucalyptus parramattensis subsp. *decadens* Drooping Red Gum	V	V	No	Generally, occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant. In the Kurri Kurri area, *E. parramattensis* subsp. *decadens* is a characteristic species of 'Kurri Sand Swamp Woodland and in the Tomago Sandbeds area, the species is usually associated with the 'Tomago Swamp Woodland'.	**Unlikely** No suitable habitat was present.
Rhodamnia rubescens Scrub Turpentine	E4A		Yes	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	**Unlikely** No suitable habitat was present.
Rhodomyrtus psidioides Native Guava	E4A		Yes	Occurs from Broken Bay New South Wales to Maryborough in Queensland. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	**Unlikely** No suitable habitat was present.
Syzygium paniculatum Magenta Lilly Pilly	E1	V	No	Occurs in a narrow coastal distribution in rainforests on sandy soils or stabilised coastal dunes from Jervis Bay to Bulahdelah in NSW.	**Unlikely** No suitable habitat was present.
**Euphrasia arguta* Eyebright	E4A	CE	Yes	Found within the Nundle area reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance.	**Unlikely** No suitable habitat was present. No known nearby records.
Persicaria elatior Tall Knotweed	V	V	No	Recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertsocaleyin, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). Grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	**Unlikely** No suitable habitat was present.
Grevillea parviflora subsp. *parviflora* Small-flower Grevillea	V	V	No	Grows in sandy or light clay soils usually over thin shales. Occurs in a range of vegetation types from heath and shrubby woodland to open forest and is found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests. Common canopy species vary greatly with community type but generally are species that favour soils with a strong lateritic influence including *Eucalyptus fibrosa*, *E. parramattensis, Angophora bakeri* and *Eucalyptus sclerophylla*.	**Low** Marginal habitat was present. No nearby records.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
Commersonia prostrata Dwarf Kerrawang	E1	E	No	Occurs on sandy, sometimes peaty soils in a wide variety of habitats: Snow Gum (*Eucalyptus pauciflora*) Woodland and Ephemeral Wetland floor at Rowes Lagoon; Blue leaved Stringybark (*E. agglomerata*) Open Forest at Tallong; and in Brittle Gum (*E. mannifera*) Low Open Woodland at Penrose; Scribbly Gum (E. *haemostoma*)/ Swamp Mahogany (*E. robusta*) Ecotonal Forest at Tomago.	**Unlikely** No suitable habitat was likely to be present.
Pomaderris brunnea Brown Pomaderris	E1	V	No	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. Grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines.	**Unlikely** No suitable habitat was likely to be present.
Asperula asthenes Trailing Woodruff	V	V	No	Occurs in damp sites, often along river banks.	**Unlikely** No suitable habitat was likely to be present.
Thesium australe Austral Toadflax	V	V	No	Grows in grassland or woodland, often in damp sites.	**Unlikely** No suitable habitat was likely to be present.
FAUNA - AMPHIBIANS					
Litoria aurea Green and Golden Bell Frog	E1	V	No	Inhabits swamps, lagoons, streams and ponds as well as dams, drains and storm water basins.	**Unlikely** No suitable habitat was present.
Mixophyes balbus Stuttering Frog	E1	V	Yes	Occurs in wet forest regions of south-eastern Queensland, Eastern NSW and Victoria. In late spring, eggs are deposited among leaf litter on the banks of streams and subsequently are washed into the water during heavy rain.	**Unlikely** No suitable habitat was present.
Mixophyes iteratus Giant Barred Frog	E1	E		Giant Barred Frogs are found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation. Moist riparian habitats such as rainforest or wet sclerophyll forest are favoured for the deep leaf litter that they provide for shelter and foraging, as well as open perching sites on the forest floor. However, Giant Barred Frogs will also sometimes occur in other riparian habitats, such as those in drier forest or degraded riparian remnants, and even occasionally around dams.	**Unlikely** No suitable habitat was present.
FAUNA - REPTILES					
Aprasia parapulchella Pink-tailed Worm-lizard	V	V		Inhabits sloping, open woodland areas with predominantly native grassy groundlayers, particularly those dominated by Kangaroo Grass (Themeda australis). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.	**Unlikely** No suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
Delma impar Striped Legless Lizard	E	E	No	Occurs in the Southern Tablelands, the Southwest Slopes, the Upper Hunter and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma, Muswellbrook and Tumut areas. Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland.	**Unlikely** No suitable habitat was likely to be present. No nearby records
FAUNA - BIRDS					
Actitis hypoleucos Common Sandpiper		M	No	Shallow pebbly, muddy or sandy edges of rivers and streams, coastal and inland; dams, lakes, sewage ponds, margins of tidal rivers, waterways in mangroves or saltmarsh; mudflats; rocky or sandy beaches.	**Unlikely** Sewage ponds were located to the east of the subject land, howver no suitable habitat was present within the subject land.
Calidris acuminata Sharp-tailed Sandpiper		M	No	Tidal mudflats, saltmarshes, mangroves; shallow fresh, brackish or saline inland wetlands; sewage ponds and irrigated pastures.	**Unlikely** Sewage ponds were located to the east of the subject land, howver no suitable habitat was present within the subject land.
Calidris ferruginea Curlew Sandpiper	E	CE	Yes	Tidal mudflats; saltmarsh; fresh, brackish or saline wetlands; sewage ponds.	**Unlikely** Sewage ponds were located to the east of the subject land, howver no suitable habitat was present within the subject land.
Calidris melanotos Pectoral Sandpiper		M	No	The Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	**Unlikely** No suitable habitat was present.
Gallinago hardwickii Latham's Snipe		M	No	Utilises a variety of habitats, such as soft wet ground or shallow water with tussock and other green and dead vegetation, and scrub or open wetland from sea-level to alpine bogs (Pizzey & Knight, 2001).	**Low** Habitat was located to the east of the impact area.
Limosa lapponica baueri Bar-tailed Godwit		V & M	No	Most frequently recorded along major coastal river estuaries and sheltered embayments, particularly the Tweed, Richmond, Clarence, Macleay, Hastings, Hunter and Shoalhaven River estuaries, Port Stephens and Botany Bay. Found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and	**Unlikely** No suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
				bays. Less frequently it occurs in salt lakes and brackish wetlands, sandy ocean beaches and rock platforms.	
Limicola falcinellus Broad-billed Sandpiper	V	M		Broad-billed Sandpipers favour sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs as feeding and roosting habitat. Occasionally, individuals may be recorded in sewage farms or within shallow freshwater lagoons. Broad-billed Sandpipers roost on banks on sheltered sand, shell or shingle beaches.	**Unlikely** No suitable habitat was present.
Numenius madagascariensis Eastern Curlew		CEM	Yes	Estuaries, tidal mudflats, sandspits, saltmarshes, mangroves; occasionally fresh or brackish lakes.	**Unlikely** No suitable habitat was present.
Tringa nebularia Common Greenshank				Inhabits a wide variety of inland permanent and temporary wetlands and sheltered coastal habitats of varying salinity.	**Unlikely** No suitable habitat was present.
Charadrius leschenaultii Greater Sand-plover	V		No	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.	**Unlikely** No suitable habitat was present.
Rostratula australis Australian Painted snipe	E1	E	No	Margins of swamps and streams, chiefly those covered with low and stunted vegetation.	**Unlikely** No suitable habitat was present.
Cuculus optatus Oriental Cuckoo		M	No	Inhabits a range of forests, typically feeding on insects and larvae.	**Low** Due to the non-specific habitat requirements of this species habitat was considered to be present.
Botaurus poiciloptilus Australasian Bittern	E1	E	No	The Australasian Bittern lives alone or in loose groups and favours permanent fresh waters dominated by sedges, rushes, reeds or cutting grasses (e.g. Phragmites, Scirpus, Eleocharis, Juncus, Typha, Baumea and Gahnia) and feeds on insects, small fish, eels, frogs and other aquatic life, sometimes in rice fields.	**Unlikely** No suitable habitat was present.
Ephippiorhynchus asiaticus Black-necked Stork	E1		No	Widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW. Breeding has been recorded as far south as Tomago NSW.	**Unlikely** No suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
Anseranas semipalmata Magpie Goose	V		No	Relatively common in the Australian northern tropics. Records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges.	**Unlikely** No suitable habitat was present.
Oxyura australis Blue-billed Duck	V			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.	**Unlikely** No suitable habitat was present.
Stictonetta naevosa Freckled Duck	V			Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.	**Unlikely** Sewage ponds were located to the east of the subject land, howver no suitable habitat was present within the subject land.
Apus pacificus Fork-tailed Swift		M	No	Inhabits the airspace over open country from semi deserts to coasts.	**Moderate** Due to the non-specific habitat requirements of this species habitat was considered to be present.
Irediparra gallinacea Comb-crested Jacana	V		No	Occurs in northern and eastern Australia, mainly in coastal and subcoastal regions, from the north-eastern Kimberley Division of Western Australia to Cape York Peninsula then south along the east coast to the Hunter region of NSW. Inhabits permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially waterlilies, or fringing and aquatic vegetation.	**Unlikely** No suitable habitat was present.
Sternula nereis nereis Australian Fairy Tern		V	No	Nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation.	**Unlikely** No suitable habitat was present.
Ptilinopus magnificus Wompoo Fruit-Dove	V		No	Occurs along the coast and coastal ranges from the Hunter River in NSW to Cape York Peninsula. It is rare south of Coffs Harbour. Found in, or near rainforest, low elevation moist eucalypt forest and brush box forests.	**Unlikely** No suitable habitat was present.
Calyptorhynchus lathami Glossy Black-Cockatoo	V		No	Lowland coastal forests, dense mountain forests, semi-arid woodland and trees bordering watercourses, with (Allo)Casuarina trees for foraging.	**Low** Marginal habitat was present.
Callocephalon fimbriatum Gang Gang Cockatoo	V		No	Tall montane forests and woodlands in mature wet sclerophyll forests. Requires hollows in which to breed between October and January.	**Low** Marginal habitat was present.
Lathamus discolor Swift Parrot	E1	CE	Yes	Open Forest to Woodland, also street trees and in parks and gardens, winter flowering eucalypts for feeding. This species nests in Tasmania during the summer months.	**Low - Medium**

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
		M			Seasonal foraging habitat was present.
Neophema chrysostoma Blue-winged Parrot		V	No	Inhabits a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones. Favours grasslands and grassy woodlands. Often found near wetlands both near the coast and in semi-arid zones. Can also be seen in altered environments such as airfields, golf-courses and paddocks.	**Low** Due to the non-specific habitat requirements of this species habitat was considered to be present.
Glossopsitta pusilla Little Lorikeet	V		No	Tall Open Forests, woodlands, orchards, parks and street trees.	**Moderate - High** Foraging habitat was present.
Hirundapus caudacutus White-throated Needletail		V & M	No	Inhabits the airspace above forests, woodlands, farmlands, plains, lakes, coasts and towns.	**Moderate** Due to the non-specific habitat requirements of this species habitat was considered to be present.
Artamus cyanopterus cyanopterus Dusky Woodswallow	V		No	The Dusky Woodswallow is found in open forests and woodlands and may be seen along roadsides and on golf courses.	**Moderate** Foraging and roosting habitat was present.
Monarcha melanopsis Black-faced Monarch		M	No	Utilises a range of habitats including rainforests, eucalypt woodlands, coastal scrubs (Pizzey & Knight, 2001).	**Low** Marginal habitat was present.
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch		M	No	Wet forests, thickly wooded gullies, waterside vegetation and mangroves.	**Unlikely** Suitable wet forest vegetation was not present on site for this species.
Pycnoptilus floccosus Pilotbird		V	No	Found in wet forested areas and heathland in eastern Victoria and south-eastern New South Wales	**Unlikely** No suitable habitat was present.
Epthianura albifrons White-fronted Chat	V		No	In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Gregarious species usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground.	**Unlikely** No suitable habitat was present.
Melanodryas cucullata cucullata	V		No	Eucalypt woodlands, Acacia scrublands, Banksia dominated coastal scrubs and open forests.	**Low**

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
Hooded Robin (south-eastern form)					Marginal habitat was present.
Myiagra cyanoleuca Satin Flycatcher		M	No	Satin Flycatchers inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	**Moderate** Suitable habitat was present.
Rhipidura rufifrons Rufous Fantail		M	No	Utilises a range of habitats including rainforests, wet sclerophyll forests, monsoon forests, scrubs, mangroves, watercourses, parks and gardens. During migration this species also utilises farms, street trees and buildings.	**Moderate** Transitory habitat was present.
Climacteris picumnus victoriae Brown Treecreeper	V	V	No	This species is a medium sized insectivorous bird that occupies Eucalypt woodlands, particularly open woodlands lacking a dense understorey, River Red Gums on watercourses and around lakeshores. It is sedentary and nests in tree hollows within permanent territories.	**Low** Foraging habitat was present.
Stagonopleura guttata Diamond Firetail	V		No	Inhabits areas with a grassy, shrubby understorey including Eucalypt woodlands, forests, Acacia scrubs and mallee.	**Low-Moderate** Foraging habitat was present.
Motacilla flava Yellow Wagtail		M	No	Habitat includes paddocks, and marshes. Open country near swamps, salt marshes, sewerage ponds, grassed surrounds to airfields, bare ground; occasionally on drier inland plains. Rare but regular visitor around the Australian coast, especially the NW coast; Broome to Darwin.	**Unlikely** No suitable habitat was present.
Pomatostomus temporalis subsp. *temporalis* Grey-crowned Babbler	V		No	Open forest, woodland, scrubland, farmland and outer suburbs. Prefers woodlands with regenerating trees, tall shrubs, and an intact ground cover of grass and forbs.	**High/Known - Unkempt nest recorded on site** Suitable habitat was present and recent nearby records.
Anthochaera phrygia Regent Honeyeater	E4A	CEM	Yes	Temperate woodlands and open forest, including forest edges, preferring to forage on large-flowered Eucalypts.	**Low** Seasonal foraging habitat was present.
Grantiella picta Painted Honeyeater	V	V	No	Nomadic, within a range of generally drier forested areas with mistletoes.	**Low** Marginal habitat was present.
Melithreptus gularis gularis Black-chinned Honeyeater (eastern subspecies)	V		No	Usually found on the western side of the Great Dividing Range in dry sclerophyll forests and woodlands containing box-ironbark associations and River Red Gum. In the Hunter Valley this species is known to utilise drier coastal woodlands. Usually found in open woodlands.	**Low-Moderate** Suitable habitat was present.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
Daphoenositta chrysoptera Varied Sittella	V		No	Open eucalypt woodland/forest, mallee, inland acacia, coastal tea-tree scrubs, golf courses, orchards and parks.	**Moderate** Suitable habitat was present.
Circus assimilis Spotted Harrier	V		No	Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Found in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land.	**Low** Marginal habitat was present.
Pandion cristatus Eastern Osprey	V		No	Found right around the Australian coastline. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feeds on fish over open waters.	**Unlikely** No suitable habitat for this species
Lophoictinia isura Square-tailed Kite	V		No	Inhabits open forests and woodlands, particularly those on fertile soils with abundant passerines.	**Low** Nesting habitat is available for this species within trees present on site.
Erythrotriorchis radiatus Red Goshawk	E4A	E	Yes	The species is very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus forest of coastal rivers.	**Unlikely** This species is unlikely to utilise the site. No nearby records.
Hieraaetus morphnoides Little Eagle	V		No	Is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used.	**Moderate** Suitable habitat was present.
Haliaeetus leucogaster White-bellied Sea-Eagle	V	M	No	Occupies habitat characterised by the presence of large areas of open water and feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans. The nests are built in a variety of sites including tall trees, bushes, mangroves, cliffs, rocky outcrops, caves, crevices, on the ground or even in artificial structures.	**Recorded hunting near the subject land** This species could potentially utilise the subject land for nesting with suitable hunting habitat in the form of the sewage ponds and Four Mile Creek being located to the east of the subject land.
Falco hypoleucos Grey Falcon	E1		No	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Generally restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	**Unlikely** This species is unlikely to utilise the site.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
Falco subniger Black Falcon	V		No	Widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions.	**Low** Habitat is available for this species across the site.
Ninox connivens Barking Owl	V			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 found on these fertile riparian soils.	**Low** Hunting and roosting/nesting habitat was present.
Ninox strenua Powerful Owl	V		No	Inhabits a wide range of vegetation types from wet Eucalypt forests with a Rainforest understorey to Dry Open Forests and Woodlands. The species has been recorded utilising disturbed habitats such as exotic pine plantations and large trees in parks and gardens. Powerful Owls nest in a slight depression in the wood-mould on the base of a cavity in a large old tree, sometimes in excess of 25 metres above the ground.	**Low** Hunting and roosting/nesting habitat was present.
Tyto novaehollandiae Masked Owl	V			Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides.	**Low** Hunting and roosting/nesting habitat was present.
FAUNA – MAMMALS					
Dasyurus maculatus ssp. *maculatus* Spotted-tailed Quoll	V	V	No	Inhabits sclerophyll forests, rainforests and coastal woodlands. Nests are made in rock caves and hollow logs or trees, and basking sites are usually found nearby.	**Low** Marginal habitat was available for this species.
Phascogale tapoatafa Brush-tailed Phascogale	V		No	Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter.	**Low** Suitable habitat was present for this specieshowever there are no nearby records of this species.
Phascolarctos cinereus Koala	V	V	No	Coastal woodland and open forest containing suitable food trees.	**Low** Only marginal habitat was present.
Petrogale penicillata Brush-tailed Rock-wallaby	E1	V	Yes	Found in steep rocky sites in sclerophyll forests with a grassy understorey.	**Unlikely** No suitable habitat was present.
Macropus parma Parma Wallaby	V		No	Range is now confined to the coast and ranges of central and northern NSW from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino. Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	**Unlikely** No nearby records of this species.

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
Potorous tridactylus sp. *tridactylus* Long-nosed Potoroo	V	V	No	This species is known from a variety of habitats, including Rainforest, Open Forests and Woodlands with dense groundcover, and dense, wet coastal heathlands. Soft (often sandy) substrates are preferred by this species.	**Unlikely** No preferred habitat was present.
Petaurus australis Yellow-bellied Glider	V	V	No	Occurs 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. Is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.	**Low** Only marginal habitat was present. No nearby records.
Petaurus norfolcensis Squirrel Glider	V		No	Dry sclerophyll forests and woodlands with exudates for foraging and hollows for nesting.	**High** Habitat for this species was present. Known nearby records of this species.
Petauroides volans Greater Glider		V	No	Eucalypt-dominated low open forests on the coast to tall forests in the ranges and low woodland west of Great Dividing Range. Not found within rainforests.	**Unlikely** No preferred habitat was present.
Pseudomys novaehollandiae New Holland Mouse		V	No	Known to inhabit open heathlands, open woodlands with a heathland understorey and vegetated sand dunes.	**Unlikely** No suitable habitat was present for this species.
Pteropus poliocephalus Grey-headed Flying-Fox	V	V	No	Wet and Dry Sclerophyll Forests, Rainforest, Mangroves and Paperbark swamps and Banksia Woodlands.	**Known - Recorded on site** Seasonal foraging habitat was available in the form of flowering myrtaceous canopy species. Nearby records of this species
Falsistrellus tasmaniensis Eastern False Pipistrelle	V			Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	**Low** Suitable hunting habitat were present.
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	V		No	Has been reported from a wide variety of habitats. Roosts in tree hollows, animal burrows, dry clay cracks, under rock slabs and in abandoned Sugar Glider nests.	**Low** Suitable hunting habitat were present.
Micronomus norfolkensis Eastern Coastal Free-tailed Bat	V		No	Appears to live in sclerophyll forests and woodland. Roosts in tree hollows or under loose bark.	**Moderate** Suitable hunting habitat was available.
Miniopterus australis Little Bentwing-bat	V		Yes	Tropical rainforest to warm-temperate wet and dry sclerophyll forest; caves or similar structures for roosting.	**Recorded on site** Suitable hunting habitat was available. Suitable roosting

SPECIES	STATUS			HABITAT DESCRIPTION AND LOCALLY KNOWN POPULATIONS	LIKELIHOOD OF OCCURRENCE WITHIN THE SITE
	BC Act 2016	EPBC Act 1999	SAII		
					and hunting habitat was present.
Miniopterus orianae oceanensis Large Bentwing-bat	V		No	Wet and dry tall open forest, rainforest, monsoon forest, open woodland, paperbark forests and open grasslands, caves or similar structures for roosting. It occasionally uses tree hollows.	**Low-Moderate** Suitable foraging habitat was present. Preferred roosting habitat in the form of caves was absent.
Myotis macropus Southern Myotis	V		No	Various habitats of the coast and adjacent ranges with suitable waterbodies for hunting; caves or similar structures for roosting. It occasionally uses tree hollows.	**Low** Preferred roosting habitat in the form of caves was absent.
Scoteanax rueppellii Greater Broad-nosed Bat	V			Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings.	**Moderate** Suitable hunting and roosting habitat was available.
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.	**Unlikely** No preferred habitat was available for this species
Chalinolobus dwyeri Large Pied Bat	V	V	Yes	Occupies dry sclerophyll forest and woodland. Roosts in caves, abandoned mud-nests of Fairy Martins and mine tunnels.	**Low** Suitable foraging habitat was present. Preferred roosting habitat was absent.

5.4 FAUNA APPRASIAL RESULTS

5.4.1 DIURNAL SURVEYS

Amphibians

No amphibian species were observed or heard calling during surveys.

Reptile Survey

No reptile species were observed during surveys.

Avifauna

Habitat for a number of avifauna species was found to occur within the site and observed within the airspace above the site. Species recorded during surveys were *Alisterus scapularis* (Australian King Parrot), *Trichoglossus moluccanus* (Rainbow Lorikeet), *Trichoglossus chlorolepidotus* (Scaly-breated Lorikeet), *Cacatua sanguinea* (Little Corella), *Corvus coronoides* (Australian Raven), *Manorina melanocephala* (Noisy Miner), *Cracticus tibicen* (Australian Magpie), *Grallina cyanoleuca* (Magpie-lark), *Coracina novaehollandiae* (Black-faced Cuckoo Shrike), *Dacelo novaeguineae* (Laughing Kookaburra), *Cracticus torquatus* (Grey Butcherbird), *Platycercus eximius* (Eastern Rosella), *Ocyphaps lophotes* (Crested Pigeon). A deceased *Phaps chalcoptera* (Common Bronzewing) was located within the subject land and an unkempt nest associated with *Pomatostomus temporalis* subsp. *temporalis* (Grey-crowned Babbler) was also located within the subject land.

Species observed flying over the site included *Platalea regia* (Royal Spoonbill), *Phalacrocorax sulcirostris* (Little Black Cormorant), *Threskiornis spinicollis* (Black-necked Ibis), *Chenonetta jubata* (Australian Wood Duck), *Anas superciliosa* (Pacific Black Duck). *Haliaeetus leucogaster* (White-bellied Sea Eagle) was observed hunting over the sewage ponds to the east of the subject land. This specimen briefly was observed hunting over the far eastern portion of the subject land during fieldwork.

Two avifauna species, *Haliaeetus leucogaster* (White-bellied Sea Eagle) and *Pomatostomus temporalis* subsp. *temporalis* (Grey-crowned Babbler) are listed as Vulnerable under the BC Act 2016. Both species have been addressed further under the BC Act in Section 7.0 of this report.

Mammal Survey

A number of mammals were found to utilise the study area during surveys. During the spotlighting survey specimens of *Trichosurus vulpecula* (Common Brushtail Possum) were observed within all four hollow-bearing trees. *Pteropus poliocephalus* (Grey-headed Flying-Fox) were observed during the stag watching surveys flying into the site and foraging on *Syagrus romanzoffiana* (Cocus Palm) located within the subject land during stag watching and spotlighting surveys. *Austronomus australis* (White-striped Freetail Bat) was heard during the spotlighting survey. Camera traps recorded specimens of *Trichosurus vulpecula* (Common Brushtail Possum).

Oryctolagus cuniculus (European Rabbit) was observed within the east of the subject land and scats attributed to this introduced species were also observed.

The subject land contained a hobby farm with many *Equus caballus* (Domestic Horse) and an individual *Ovis aries* (Domestic Sheep) kept within the subject land. Areas of land had been divided into small paddocks using fencing wire.

Pteropus poliocephalus (Grey-headed Flying-Fox) is listed as Vulnerable under both State and National legislation and has therefore been assessed under the BC Act 2016 in Section 7.0 and 10.0 of this report.

5.5 SURVEY LIMITATIONS

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

Limitations were also generally related to members of the public as a result of the nearby presence of the Regal Inn and residential development. Persons were very regularly observed walking along the boundary of the subject land and attending the neighbouring Inn's garden and play area. This somewhat restricted locations to place expensive camera equipment. The presence of neighbouring residential development and Metford Road also restricted spotlighting consistency. Limiting factors also included the detection of species with large home ranges such as *Dasyurus maculatus* (Tiger Quoll) and Large Forest Owls. Climate variability may also affect the occurrence of some species such as *Lathamus discolor* (Swift Parrot) and *Anthochaera phrygia* (Regent Honeyeater).

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

6.0 IMPACT ASSESSMENT

6.1 AVOIDANCE AND MINIMISATION OF IMPACTS

The site chosen for the proposed manufactured housing estate is located adjacent to residential development, the Regal Inn and is located less than 40m south of another manufactured housing estate within the locality. The site has been utilised as a hobby farm for the past 35 years. The vegetation within the proposed development is a disturbed with a mix of native and exotic species. Few areas of vegetation within the subject land have remained in close to their original state with lack of native midstorey and shrub species.

6.2 DIRECT IMPACT

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

- Removal of up to 0.51ha of highly disturbed PCT 3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest;
- Removal of up to 0.51ha of highly disturbed example of the EEC Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions;
- Removal of up to 1.47ha of Couch Grassland;
- Removal of up to 3.15ha of Grazed Exotic Groundcover with Planted Gardens;
- Removal of four hollow-bearing trees;
- Removal of 75 native trees (Appendix B);
- Removal of known hunting habitat for *Haliaeetus leucogaster* (White-bellied Sea-Eagle);
- Removal of known roosting and hunting habitat for *Miniopterus australis* (Little Bentwing Bat)
- Removal of known habitat for the threatened species *Pomatostomus temporalis temporalis* (Grey-crowned Babbler), including one unkempt Grey-crowned Babbler Nest (as of February 2024);
- Removal of known foraging habitat for the threatened species *Pteropus poliocephalus* (Grey-headed Flying Fox);
- Removal of known habitat for a number of the addressed threatened species.

6.3 INDIRECT IMPACTS

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

- Erosion and sedimentation;
- Increased spread of priority and other weed species;
- Edge effects.
- Other impacts on biodiversity values.

6.4 MITIGATION MEASURES

Mitigation measures have been specified to minimise the impact of the vegetation clearance to protect fauna species and habitat. The measures will include:

Trees and other Native Vegetation

Where possible, works should minimise any impact to native vegetation outside the scope of the proposal. Where unavoidable, works should minimise impacts to trees as follows:

- The clearance boundary is to be clearly marked with flagging tape;
- trees to be removed or trimmed are to be clearly marked to prevent any unintentional impact on trees that are to remain untouched;
- the clearing or trimming of any trees should be undertaken in a manner that avoids damaging adjacent vegetation;
- all material stockpiles, vehicle parking and machinery storage will be located within cleared areas proposed for clearing, and not in areas of native vegetation that are to be retained.

Hollow-bearing Trees and *Miniopterus australis* (Little Bentwing Bat)

- Wherever possible, works should avoid impacts to hollow-bearing trees;
- Nest boxes are to be installed into retained trees at a ratio of two nest boxes per hollow-bearing tree. The nest boxes are to be installed prior to tree clearance within retained trees;
- Artificial nest boxes should be installed onto trees in the nearest adjacent area of similar habitat by a suitably qualified ecologist.
- The removal of hollow-bearing trees should be supervised by a suitably qualified ecologist to reduce the impact on any fauna which may be present.

Pomatostomus temporalis temporalis (Grey-crowned Babbler)

One tree was found to contain and unkempt Grey-crowned Babbler nests/roost. The removal of Grey-crowned Babbler habitat will require the following:

- Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) to search for Grey-crowned Babbler nests. If a nest is located within the clearance area then a relocation plan is to be implemented.
- If any nests are found to contain eggs or nestlings no clearance works will be allowed within the vicinity of any of the nests until the young have fledged (Only the breeding female usually sits on the eggs, the remainder of the birds will roost in another nearby nest). The nests/roosts will likely require an Elevated Work Platform (EWP) to access the nest
- Once it is determined there is no active breeding nests, they will then be relocated by an ecologist into neighbouring trees which are to remain *in-situ.*

Haliaeetus leucogaster (White-Bellied Sea Eagle)

Haliaeetus leucogaster (White-Bellied Sea Eagle) was observed hunting within the immediate local area and briefly over the far east of the subject land. Surveys did not record any evidence of breeding in the

form of large stick nests in trees within the subject land or in close proximity despite targeted searches. The removal of White-Bellied Sea Eagle habitat will require the following:

- Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) to search for White-Bellied Sea Eagle nests. If a nest is located within the clearance area then Maitland City Council is to be immediately notified and a plan is to be implemented.

Pteropus poliocephalus (Grey-headed Flying-Fox)

Pteropus poliocephalus (Grey-headed Flying-Fox) were observed flying into the subject land and foraging on *Syagrus romanzoffiana* (Cocus Palm) during stag watching and spotlighting surveys.
The removal of *Pteropus poliocephalus* (Grey-headed Flying-Fox) foraging habitat will require the following:

- Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) to search for Grey-headed Flying-Fox. If a Grey-headed Flying-Fox is located within the clearance area then a suitably qualified ecologist will be required to undertake a health assessment of the animal and relocate the specimen if healthy or take to a vet for treatment.

Lower Hunter Spotted Gum—Ironbark Forest in the NSW North Coast Bioregion

Approximately 0.51ha of the EEC Lower Hunter Spotted Gum - Ironbark Forest in the NSW North Coast Bioregion will require removal as a result of the proposal. Clearance is to be restricted to the impact area for the proposal, with the impact area clearly defined. Where possible, as much of this EEC should be retained within the scope of the proposal.

Weeds

All machinery and equipment are to be inspected for weeds and weed propagules prior to going on site to prevent the introduction of new weed species to the area. It is recommended that all Priority Weeds within the subject land be controlled as part of routine property maintenance. Particular attention should be given to the weeds listed in Table 5.4 of this report.

7.0 CONSIDERATIONS UNDER SECTION 7.3 OF THE BC ACT 2016

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

A detailed assessment for each BC Act 2016 listed threatened species located within the study area is undertaken in Appendix C.

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

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

Threatened Flora

No threatened flora species were recorded within the subject land during fieldwork. Of the 25 flora species assessed, the subject land was found to contain suitable habitat for 5 of the addressed species:

- *Pterostylis chaetophora* (Tall Rustyhood);
- *Rhizanthella slateri* (Eastern Underground Orchid)
- *Rutidosis heterogama* (Heath Wrinklewort);
- *Eucalyptus glaucina* (Slaty Red Gum)
- *Grevillea parviflora* subsp. *parviflora* (Small-flowered Grevillea)

Of these addressed threatened flora species the most likely to occur within the subject land area would include *Pterostylis chaetophora* (Tall Rustyhood) and *Eucalyptus glaucina* (Slaty Red Gum). The proposal may result in an incremental loss of habitat for these threatened flora species; however, it is considered not likely that the proposal would significantly affect the life cycle of any of these threatened flora species or place any viable local populations of at risk of extinction.

Threatened Fauna

Four threatened species were recorded utilising the site during surveys. Although no individuals were observed, an unkempt nests/roost attributed to *Pomatostomus temporalis temporalis* (Grey-crowned Babbler) was located within the subject land during fieldwork. An indivisual *Haliaeetus leucogaster* (White-Bellied Sea Eagle) was observed hunting over the subject land and adjoining lands during surveys. *Pteropus poliocephalus* (Grey-headed Flying-Fox) were observed flying into the subject land and foraging on *Syagrus romanzoffiana* (Cocus Palm) during stag watching and spotlighting surveys. *Miniopterus australis* (Little Bentwing Bat) was positively identified within the subject land during the Anabat survey.

Pomatostomus temporalis temporalis (Grey-crowned Babbler)

An unkempt nests/roost attributed to *Pomatostomus temporalis temporalis* (Grey-crowned Babbler) was observed within the subject land during fieldwork. The proposal will result in a small incremental reduction of nesting/roosting and foraging habitat within the locality. Recommendations have been made within Section 6.4 to minimise impacts to the local occurrence of this species. Provided recommendations made within Section 6.4 to minimise impacts to the local occurrence of this species are met it is considered unlikely that the proposed road rehabilitation would place any viable local populations of Grey-crowned Babbler at risk of extinction.

Haliaeetus leucogaster (White-Bellied Sea Eagle)

Haliaeetus leucogaster (White-Bellied Sea Eagle) was observed hunting within the immediate local area and briefly over the far east of the subject land. Surveys did not record any evidence of breeding in the form of large stick nests in trees within the subject land or in close proximity despite targeted searches. The proposal will have an incremental reduction in hunting habitat for this species. Taking into consideration the recommendations of protection of areas of native vegetation during construction activities the proposal is unlikely to have a significant impact on *H. leucogaster* such that a local population would be placed at risk of extinction.

Pteropus poliocephalus (Grey-headed Flying-Fox)

Pteropus poliocephalus (Grey-headed Flying-Fox) were observed flying into the subject land and foraging on *Syagrus romanzoffiana* (Cocus Palm) during stag watching and spotlighting surveys. The study area contained suitable foraging habitat for this species within areas of PCT 3433. The proposal will result in an incremental reduction in foraging habitat within the local area. Considering the recommendations and the presence of larger areas of adjoining and nearby habitat, it is considered unlikely to result in the extinction of any local population of *P. poliocephalus.*

Miniopterus australis (Little Bentwing Bat)

M. australis was positively identified within the site during the microchiropteran bat call survey. The entire site is likely to contain suitable roosting habitat in the form of tree hollows and hunting and habitat for this microchiropteran bat species. Preferred roosting habitat in the form of caves was absent within the site, however man-made structures in the form of pre-existing dwellings and associated infrastructure were located within the subject land. No microchiropteran bats were observed exiting these structures duering stagwatching surveys. The removal of vegetation and 4 hollow-bearing trees from this site may result in an incremental loss in the quality of hunting and roosting habitat in the local area. Taking into consideration the relatively large amount of suitable hunting and roosting habitat retained within the local area, the absence of preferred roosting habitat within the site and the recommendation for compensatory nest boxes the proposal is unlikely to disrupt the life cycle of *M. australis* such that local extinction would occur.

Of the 52 remaining addressed threatened fauna species the subject site was considered to contain suitable habitat for 31 species:

- *Calyptorhynchus lathami* Glossy Black-Cockatoo
- *Callocephalon fimbriatum* Gang Gang Cockatoo
- *Lathamus discolor* Swift Parrot
- *Neophema chrysostoma* Blue-winged Parrot
- *Glossopsitta pusilla* Little Lorikeet
- *Artamus cyanopterus cyanopterus* Dusky Woodswallow
- *Melanodryas cucullata cucullata* Hooded Robin (south-eastern form)
- *Climacteris picumnus victoriae* Brown Treecreeper
- *Stagonopleura guttata* Diamond Firetail
- *Anthochaera phrygia* Regent Honeyeater
- *Grantiella picta* Painted Honeyeater
- *Melithreptus gularis gularis* Black-chinned Honeyeater
- *Daphoenositta chrysoptera* Varied Sittella
- *Lophoictinia isura* Square-tailed Kite
- *Hieraaetus morphnoides* Little Eagle
- *Falco subniger* Black Falcon
- *Ninox connivens* Barking Owl
- *Ninox strenua* Powerful Owl
- *Tyto novaehollandiae* Masked Owl
- *Dasyurus maculatus ssp. maculatus* Spotted-tailed Quoll
- *Phascogale tapoatafa* Brush-tailed Phascogale
- *Phascolarctos cinereus* Koala
- *Petaurus australis* Yellow-bellied Glider
- *Petaurus norfolcensis* Squirrel Glider
- *Falsistrellus tasmaniensis* Eastern False Pipistrelle
- *Saccolaimus flaviventris* Yellow-bellied Sheathtail-bat
- *Micronomus norfolkensis* East Coastal Free-tailed Bat
- *Miniopterus orianae oceanensis* Large Bentwing-bat
- *Myotis macropus* Southern Myotis
- *Scoteanax rueppellii* Greater Broad-nosed Bat
- *Chalinolobus dwyeri* Large Pied Bat

Of these remaining threatened fauna species those most likely to utilise the site would include a number of the woodland birds, Brush-tailed Phascogale, Squirrel Glider and microchiropteran bats. The proposal will result in a small incremental reduction habitat for the above species. Given the small impact it is unlikely that the proposal will have a significant impact on these threatened fauna species such that a local extinction would occur.

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

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

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

Native vegetation occurring within the subject land was found to be consistent which that of the BC Act listed EEC – Lower Hunter Spotted Gum—Ironbark Forest in the NSW North Coast Bioregion. This EEC is tenuously connected to a larger remnant area of similar vegetation surrounding the subject land. As a result of the proposal, an area of approximately 0.51ha of highly disturbed Lower Hunter Spotted Gum—Ironbark Forest will be removed, which includes the removal of 36 trees. Given the locality of the subject land and the highly disturbed nature of the remnant vegetation the proposed Manufactured Housing Estate is unlikely to have a significant impact on areas identified as Lower Hunter Spotted Gum—Ironbark Forest in the NSW North Coast Bioregion such that the local occurrence is likely to be placed at risk of extinction.

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

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

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

- Removal of up to 0.51ha of highly disturbed PCT 3433 - Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest;
- Removal of up to 0.51ha of highly disturbed example of the EEC Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions;
- Removal of up to 1.47ha of Couch Grassland;
- Removal of up to 3.15ha of Grazed Exotic Groundcover with Planted Gardens;
- Removal of four hollow-bearing trees;
- Removal of 75 native trees (Appendix B);
- Removal of known hunting habitat for *Haliaeetus leucogaster* (White-bellied Sea-Eagle);

- Removal of known roosting and hunting habitat for *Miniopterus australis* (Little Bentwing Bat);

- Removal of known habitat for the threatened species *Pomatostomus temporalis temporalis* (Grey-crowned Babbler), including one unkempt Grey-crowned Babbler Nest (as of February 2024);
- Removal of known foraging habitat for the threatened species *Pteropus poliocephalus* (Grey-headed Flying Fox);
- Removal of known habitat for a number of the addressed threatened species.

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

No areas of habitat are likely to become significantly fragmented or isolated from others areas of habitat as a result of 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 proposed development will result in the removal of 75 trees which will result in the loss of a small amount of habitat for those threatened species with potential habitat on site. Areas of habitat to be removed are important due to the presence of the threatened species *Miniopterus australis* (Little Bentwing Bat), *Pomatostomus temporalis temporalis* (Grey-crowned Babbler) as well as potential habitat of varying quality for 31 addressed threatened species. However, taking the recommendations into consideration, no area of habitat important to the long-term survival of these species and ecological communities will be significantly impacted.

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

No areas of outstanding biodiversity value are within the study area.

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

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

Table 7.1: Key Threatening Processes.

Key Threatening Process	Applicability in regards to the subject land
Clearing of Native Vegetation.	The proposal will result in the removal of native vegetation and may be viewed as being part of this Key Threatening Process. However, the action is unlikely to be responsible for the significant loss of any TEC, endangered population or

Key Threatening Process	Applicability in regards to the subject land
	threatened species provided that recommendations for impact minimisation as listed within Section 6.4 are undertaken.
Loss of Hollow-bearing Trees	Four hollow-bearing trees were recorded within the development footprint and all will require removal as a result of the proposed development. Nest boxes are to be installed into retained trees at a ratio of two nest boxes per hollow-bearing tree. The nest boxes are to be installed prior to tree clearance within retained trees. The artificial nest boxes should be installed onto a tree in the nearest adjacent area of similar habitat by a suitably qualified ecologist. This mitigation measure will ensure that no net loss of hollows will result from the proposed development.
Removal of dead wood and dead trees	Any dead wood or dead trees requiring removal for the proposal is to be moved into retained vegetation outside of the impact area to provide ground habitat.
Invasion of native plant communities by exotic perennial grasses.	Exotic grasses such as *Chloris gayana* (Rhodes Grass) were present within the subject land. The proposal has the potential to result in an increase in invasion by exotic perennial grasses.
Reduced viability of adjacent habitat due to edge effects	The proposed development will not result in a significant increase in edge effects impacting upon the retained vegetation. The majority of the site has been historically disturbed and as such edge effects have been an ongoing impact to the retained vegetation within the study area.
Predation by the *Felis catus* (Feral Cat)	The Feral Cat was not recorded on site at the time of the survey however this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Predation by the *Vulpes vulpes* (Red Fox)	The Red Fox was not recorded during surveys within the subject land however, this species would be considered to have an impact on native fauna in the local area. The proposal is not likely to result in an increase in numbers of this introduced species.
Aggressive exclusion of birds by noisy miners (*Manorina melanocephala*)	Noisy miners were recorded within the study area. The proposal is unlikely to increase the impacts associated with this species.
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	It is unknown what impact fire has had within the subject land.
Invasion, establishment and spread of Lantana (*Lantana camara*)	Lantana was recorded within the subject land. It is recommended that this weed be controlled as part of routine property maintenance.
Competition and grazing by the feral European rabbit	Scats associated with the European rabbit. The proposal is not likely to result in an increase in feral numbers of this introduced species.
Infection by *Psittacine circoviral* (beak and feather) disease affecting endangered psittacine species	No evidence of the disease was observed on psittacine species.
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis.	No evidence of chytrid was observed during site visits.
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae.	No evidence of the fungi was observed during site visits.
Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata*	African Olive was observed within the study area. Any occurrences of this weed should be managed as part of routine property maintenance.

8.0 CONSIDERATIONS UNDER STATE ENVIRONMENTAL PLANNING POLICY (BIODIVERSITY AND CONSERVATION) 2021

8.1 CHAPTER 3 KOALA HABITAT PROTECTION 2020

The principal aim of this Chapter aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population.

Chapter 3 applies to land that the Chapter 4 does not apply to as defined in Schedule 2 of SEPP (Biodiversity Conservation) 2021. This includes land zoned as RU1 in the Maitland City Council LGA. This Chapter applies to areas of more than one hectare or an area, which has together with any adjoining land in the same ownership an area of more than 1 hectare, whether or not the development application applies to the whole, or only part of the land. The subject land constitutes an area over 1ha therefore Chapter 3. In addressing this Chapter there are two questions to be considered.

8.1.1 FIRST CONSIDERATION - IS THE LAND 'POTENTIAL KOALA HABITAT'?

'Potential Koala Habitat' is defined in Chapter 3 as, "...an area of native vegetation where trees of the type listed in Schedule 1 (Koala feed tree species) constitute at least 15% of the total number of trees in the upper or lower strata of the tree component".

A total of eight 'Koala Feed Tree' speciemens, six *E. tereticornis* and two *E. robusta* were recorded in the study area. These specimens did not constitute at least 15% of the trees in the upper and lower strata of the tree component. Therefore, there is no "Potential Koala Habitat" present in this area therefore no further consideration is required.

9.0 ASSESSMENT OF SERIOUS AND IRREVERSIBLE IMPACTS

Under the BC Act 2016, a determination of whether an impact is serious and irreversible (SAII) must be made in accordance with the principles prescribed in section 6.7 of the BC Regulation.

The "*Guidance to assist a decision maker to determine a serious and irreversible impact*, 2017, sets out those potential SAII species and ecological communities (known as "potential SAII entities").

The principles for determining serious and irreversible impacts in the Biodiversity Conservation Regulation, 2017 are:

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

9.1 POTENTIAL SAII ENTITIES

In this case all potential SAII entities are derived from Appendix 2 of the Guide, and are within the Bionet search area (DPE, 2023). The approval authority must take those impacts into consideration and determine whether there are any additional and appropriate measures that will minimise those impacts if approval is to be granted. An Impact evaluation is shown in Table 9.1. Entities include:

- *Caladenia tessellata* (Thick-lipped Spider-orchid);
- *Prasophyllum* sp. Wybong (A Leek Orchid);
- *Rhizanthella slateri* (Eastern Underground Orchid);
- *Rhodamnia rubescens* (Scrub Turpentine)
- *Rhodomyrtus psidioides* (Native Guava)
- *Euphrasia arguta* (Eyebright)
- *Mixophyes balbus* (Stuttering Frog)
- *Calidris ferruginea* (Curlew Sandpiper)
- *Numenius madagascariensis* (Eastern Curlew)
- *Lathamus discolor* (Swift Parrot);
- *Anthochaera phrygia* (Regent Honeyeater);
- *Erythrotriorchis radiates* (Red Goshawk);
- *Petrogale penicillata* (Brush-tailed Rock-wallaby)
- *Miniopterus australis* (Little Bentwing-bat);
- *Chalinolobus dwyeri* (Large Pied Bat);

Table 9.1: SAII impact evaluation

Potential SAII Entities	Impact Evaluation	Impact Thresholds	Further consideration required?
Caladenia tessellata Thick-lipped Spider-orchid	No habitat was considered present		No
Prasophyllum sp. Wybong A Leek Orchid	No habitat was considered present		No
Rhizanthella slateri Eastern Underground Orchid	No habitat was considered present		No
Rhodamnia rubescens Scrub Turpentine	No habitat was considered present		No
Rhodomyrtus psidioides Native Guava	No habitat was considered present		No
Euphrasia arguta Eyebright	No habitat was considered present		No
Mixophyes balbus Stuttering Frog	No habitat was considered present		No
Calidris ferruginea Curlew Sandpiper	No habitat was considered present		No
Numenius madagascariensis Eastern Curlew	No habitat was considered present		No
Lathamus discolor Swift Parrot	Seasonal foraging habitat was present.	Not within a mapped BAM Important Area (DPE, 2023	No
Anthochaera phrygia Regent Honeyeater	Seasonal foraging habitat was present.	Not within a mapped BAM Important Area (DPE, 2023)	No
Erythrotriorchis radiatus Red Goshawk	No habitat was considered present		No
Petrogale penicillata Brush-tailed Rock-wallaby	No habitat was considered present		No
Miniopterus australis Little Bentwing-bat	Suitable hunting habitat was present. Preferred roosting habitat was absent.		Yes. See Section 9.2.1
Chalinolobus dwyeri Large Pied Bat	Suitable hunting habitat was present. Preferred roosting habitat was absent.		No

9.2 ADDITIONAL IMPACT ASSESSMENT PROVISIONS FOR THREATENED SPECIES AT RISK OF AN SAII

No threatened matter consistent with a SAII candidate species identified as likely to occur or to contain significant habitat within the study area is likely to be significantly impacted by the proposed development. Although *M. australis* was positively identified within the study area during the microchiropteran bat call survey, which is an SAII species, the subject land was only considered to contain hunting habitat and roosting habitat in the form of tree hollows. Preferred roosting habitat in the

form of caves was absent within the site. The proposal will require the removal of up to four hollow-bearing trees.

9.2.1 *MINIOPTERUS AUSTRALIS* (LITTLE BENTWING BAT)

M. australis was positively identified within the study area during the microchiropteran bat call survey.

Assessment under Biodiversity Conservation Regulation 2017 6.7(2):

(1) An impact is to be regarded as serious and irreversible if it is likely to contribute significantly to the risk of a threatened species or ecological community becoming extinct because:

a It will cause a further decline of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to be in a rapid rate of decline, or

The proposal requires the removal of 0.51ha of PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest, which would provide hunting habitat for *M. australis*. The proposal will also require the removal of four hollow-bearing trees. The entire site is likely to contain suitable hunting habitat for this microchiropteran bat species. Preferred roosting habitat in the form of caves was absent within the site. Nest boxes are recommended to be installed at a ratio of 2:1 per hollow-bearing tree. The removal of vegetation from this site may result in an incremental loss of hunting habitat in the local area. Taking into consideration the relatively large amount of suitable hunting habitat in the local area, the recommendation for the installation of nest boxes, and the absence of preferred roosting habitat within the site the proposal is unlikely to disrupt the life cycle of *M. australis* such that local extinction would occur.

b It will further reduce the population size of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very small population size, or

The proposal to remove of 0.51ha of PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest is unlikely to result in the reduction of population size of Little Bentwing Bat. This vegetation only provided suitable hunting habitat for this highly mobile species and an incremental number of hollow-bearing trees. There is suitable hunting habitat and hollow-bearing trees within close proximity to the proposed impact area. Taking into consideration the suitable hunting habitat in the local area, the recommendation for compensatory nest boxes and the absence of preferred roosting habitat within the site the proposal is unlikely to reduce the population size of this species.

c It is an impact on the habitat of the species or ecological community that is currently observed, estimated, inferred or reasonably suspected to have a very limited geographical distribution, or

The Little Bentwing Bat is a highly mobile species and does not have a very limited geographical distribution. The proposal will only require the removal of 0.51ha of PCT 3433 Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest.

d The impacted species or ecological community is unlikely to respond to measures to improve its habitat and vegetation integrity and therefore its members are not replaceable.

Under the Saving Our Species Strategy the key threats to the viability of landscape-managed species are loss, fragmentation and degradation of habitat, and widespread pervasive factors such as impacts of climate change and disease. Recommendations within this report for the installation of nest boxes would ensure that no roosting habitat for this species is lost as a result of the proposal.

e Actions to avoid and minimise direct and indirect impacts

Recommendations within this report for the installation of nest boxes would ensure that no roosting habitat for this species is lost as a result of the proposal. Efforts have also been made to retain trees within the scope of the proposal. One tree, Tree No 137 (Wildthing No. 37) will be retained within the scope of the proposal and trees located within proximity to the The Regal Inn will also be retained.

10.0CONSIDERATIONS UNDER THE COMMONWEALTH ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999

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

- *World Heritage properties;*

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

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

The subject site is within 10km of the Hunter Estuary Ramsar Wetland. The proposed works is not likely to have a significant impact to any Ramsar Wetlands.

- *listed threatened species and communities;*

Nine nationally threatened ecological communities were recorded on the DCCEEW database as having potential to occur within 10km of the site, these being:

- Central Hunter Valley eucalypt forest and woodland
- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community
- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland
- Kurri sand swamp woodland of the Sydney Basin bioregion
- Lowland Rainforest of Subtropical Australia
- River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria
- Subtropical and Temperate Coastal Saltmarsh
- Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

The ecological communities located within the site were not consistent with any nationally listed threatened ecological communities.

Sixty-eight additional nationally threatened species were recorded on the DCCEEW database as occurring or having potential habitat available within 10km of the site (note all pelagic species and

ocean-going birds which do not complete part of their life cycles on mainland NSW were excluded from the search), these being:

Anthochaera phrygia	Regent Honeyeater
Ardenna grisea	Sooty Shearwater
Arenaria interpres	Ruddy Turnstone
Botaurus poiciloptilus	Australasian Bittern
Calidris acuminata	Sharp-tailed Sandpiper
Calidris ferruginea	Curlew Sandpiper
Calidris tenuirostris	Great Knot
Callocephalon fimbriatum	Gang-gang Cockatoo
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo
Charadrius leschenaultii	Greater Sand Plover
Charadrius mongolus	Lesser Sand Plover
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)
Erythrotriorchis radiatus	Red Goshawk
Falco hypoleucos	Grey Falcon
Gallinago hardwickii	Latham's Snipe
Grantiella picta	Painted Honeyeater
Hirundapus caudacutus	White-throated Needletail
Lathamus discolor	Swift Parrot
Melanodryas cucullata cucullata	South-eastern Hooded Robin
Neophema chrysostoma	Blue-winged Parrot
Numenius madagascariensis	Eastern Curlew
Pachyptila turtur subantarctica	Fairy Prion (southern)
Pluvialis squatarola	Grey Plover
Pycnoptilus floccosus	Pilotbird
Rostratula australis	Australian Painted Snipe
Stagonopleura guttata	Diamond Firetail
Sternula nereis nereis	Australian Fairy Tern
Tringa nebularia	Common Greenshank
Xenus cinereus	Terek Sandpiper
Litoria aurea	Green and Golden Bell Frog
Mixophyes balbus	Stuttering Frog
Mixophyes iteratus	Giant Barred Frog
Aprasia parapulchella	Pink-tailed Worm-lizard
Delma impar	Striped Legless Lizard
Chalinolobus dwyeri	Large-eared Pied Bat
Dasyurus maculatus maculatus	Spot-tailed Quoll
Notamacropus parma	Parma Wallaby
Petauroides volans	Greater Glider (southern and central)
Petaurus australis australis	Yellow-bellied Glider (south-eastern)
Petrogale penicillata	Brush-tailed Rock-wallaby
Phascolarctos cinereus	Koala
Potorous tridactylus tridactylus	Long-nosed Potoroo (northern)
Pseudomys novaehollandiae	New Holland Mouse
Pteropus poliocephalus	Grey-headed Flying-fox
Acacia bynoeana	Bynoe's Wattle
Angophora inopina	Charmhaven Apple
Arthraxon hispidus	Hairy-joint Grass
Asperula asthenes	Trailing Woodruff
Caladenia tessellata	Thick-lipped Spider-orchid
Commersonia prostrata	Dwarf Kerrawang
Cryptostylis hunteriana	Leafless Tongue-orchid
Cynanchum elegans	White-flowered Wax Plant

Dichanthium setosum	bluegrass
Eucalyptus glaucina	Slaty Red Gum
Eucalyptus parramattensis subsp. decadens	Earp's Gum
Euphrasia arguta	
Grevillea parviflora subsp. parviflora	Small-flower Grevillea
Persicaria elatior	Tall Knotweed
Pomaderris brunnea	Rufous Pomaderris
Prasophyllum sp. Wybong (C.Phelps ORG 5269)	a leek-orchid
Pterostylis gibbosa	Illawarra Greenhood
Rhizanthella slateri	Eastern Underground Orchid
Rhodamnia rubescens	Scrub Turpentine
Rhodomyrtus psidioides	Native Guava
Rutidosis heterogama	Heath Wrinklewort
Syzygium paniculatum	Magenta Lilly Pilly
Tetratheca juncea	Black-eyed Susan
Thesium australe	Austral Toadflax

One Nationally threatened species *Pteropus poliocephalus* (Grey-headed Flying-Fox) was observed within the subject land during surveys.

Pteropus poliocephalus (Grey-headed Flying-Fox)

Pteropus poliocephalus (Grey-headed Flying-Fox) were observed flying into the subject land and foraging on *Syagrus romanzoffiana* (Cocus Palm) during stag watching and spotlighting surveys. The study area contained suitable foraging habitat for this species within areas of PCT 3433. The proposal will result in an incremental reduction in foraging habitat within the local area. Considering the recommendations and the presence of larger areas of adjoining and nearby habitat, it is considered unlikely to result in the extinction of any local population of *P. poliocephalus.*

No other nationally threatened species were recorded on site during surveys. Habitat of varying quality was considered to be available for those mobile threatened species such as woodland birds, megachiropteran bats and microchiropteran bats. The action will result in an incremental loss/modification of habitat within the locality for these species. The removal of trees as a result of the proposal will also result in an incremental reduction of seasonal foraging habitat for the majority of birds listed above, as well as the Grey-headed Flying Fox. The proposal will result in an incremental loss of foraging and roosting/nesting habitat for these species in the local area, however it is not likely to have a significant impact on any of these species.

- *migratory species protected under international agreements;*

Thirty-two nationally listed migratory species were recorded on the DCCEEW on-line database as occurring or having potential habitat available within 10km of the subject land, these being:

Migratory Terrestrial Species:

- *Cuculus optatus* (Oriental Cuckoo)

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

Migratory Wetland Species:

- *Actitis hypoleucos* (Common Sandpiper)
- *Arenaria interpres* (Ruddy Turnstone)
- *Calidris acuminata* (Sharp-tailed Sandpiper)
- *Calidris ferruginea* (Curlew Sandpiper)
- *Calidris melanotos* (Pectoral Sandpiper)
- *Calidris ruficollis* (Red-necked Stint)
- *Calidris tenuirostris* (Great Knot)
- *Charadrius bicinctus* (Double-banded Plover)
- *Charadrius leschenaultii* (Greater Sand Plover)
- *Charadrius mongolus* (Lesser Sand Plover)
- *Gallinago hardwickii* (Latham's Snipe)
- *Limicola falcinellus* (Broad-billed Sandpiper)
- *Limosa lapponica* (Bar-tailed Godwit)
- *Limosa limosa* (Black-tailed Godwit)
- *Numenius madagascariensis* (Eastern Curlew)
- *Numenius phaeopus* (Whimbrel)
- *Pandion haliaetus* (Osprey)
- *Philomachus pugnax* (Ruff Reeve)
- *Pluvialis fulva* (Pacific Golden Plover)
- *Pluvialis squatarola* (Grey Plover)
- *Tringa brevipes* Grey-tailed Tattler
- *Tringa nebularia* (Common Greenshank)
- *Tringa stagnatilis* (Marsh Sandpiper)
- *Xenus cinereus* (Terek Sandpiper)

Migratory Marine Birds

- *Apus pacificus* (Fork-tailed Swift)

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

- *nuclear activities;*

The proposal does not involve any type of nuclear activity.

- *the Commonwealth marine environment;*

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

11.0CONCLUSION

In conclusion, the proposed subdivision, manufactured housing and associated infrastructure at 27, 29 and Part 33 Metford Road, Tenambit will result in an incremental reduction of remnant habitat, within the subject land and local area, however, is unlikely to have a significant impact on any addressed threatened species, endangered populations or threatened ecological communities considered within this report.

12.0BIBLIOGRAPHY

Bell SAJ, Rockley C, Llewellyn A. (2019). Flora of the Hunter Region, Endemic Trees and Larger Shrubs. March 2019. CSIRO Publishing.

Churchill, S. (2008). Australian Bats (2nd edn). Allen & Unwin Australia.

Cogger, H.G. (2014). Reptiles and Amphibians of Australia (7th edn.). CSIRO Publishing.

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

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2023a). EPBC Act Protected Matters Report for a 10 Kilometre radius search from the centre of the subject land. Department of the Environment, Commonwealth of Australia. Accessed via, https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl >.

DCCEEW (Department of Climate Change, Energy, the Environment and Water) (2022b). *Commonwealth species profiles and threats database (SPRAT*). Department of the Environment, Commonwealth of Australia.

DAWE (Department of Agriculture, Water and the Environment) (2016). Interim Biogeographic Regionalisation for Australia (IBRA), Version 7 (Regions). Accessed via <https://datasets.seed.nsw.gov.au/dataset/interim-biogeographic-regionalisation-for-australia-ibra-version-7-regions />

DoE (Department of the Environment) (2013). *Matters of National Significance. Significant Impact Guidelines 1.1* Environment Protection and Biodiversity Conservation Act 1999.

DPE (Department of Planning and Environment), (2024a). BioNet Atlas NSW Wildlife Database selected area. (Data extracted February 2024).

DPE (Department of Planning and Environment), (2024b). NSW Biodiversity Values Map accessed via <https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap>.

DPE (Department of Planning and Environment), (2024c) BioNet vegetation classification database. Accessed via < http://www.environment.nsw.gov.au/research/Visclassification.htm>

DPE (Department of Planning and Environment), (2024d). Profiles of threatened species, population, and ecological communities. Accessed via <http://www.environment.nsw.gov.au/threatenedspeciesapp/>

DPIE (Department of Planning, Industry and Environment), (2011). *Soil and Land Resources of the Hunter Region, version 1.5, NSW Department of Planning, Industry and Environment, Parramatta.*

DPIE (Department of Planning, Industry and Environment) (2017) BioNet NSW (Mitchell) Landscapes – Version 3.1 accessed via < https://datasets.seed.nsw.gov.au/dataset/nsw-mitchell-landscapes-version-3-1>.

DPIE (2023). Department of Planning, Industry and Environment, 2020, Soil and Land Resources of the Hunter Region, version 1.5, NSW Department of Planning, Industry and Environment, Parramatta.

Harden, G (1991-2000). *Flora of New South Wales*. Vols 1-4. NSW University Press.
Landcom (2004). *Managing Urban Stormwater: Soils and Construction.* National Library of Australia, Canberra, Australia

Leonard, G. (2007). *Eucalypts: A Bushwalker's Guide. Second Edition* New South Wales University Press, Sydney.

LPI (Land and Property Information NSW), (2023). NSW Imagery Web Services.

Nearmap (2023) Aerial image of the subject land.

NSW Government (2018) *Australia's IBRA Bioregions and sub-bioregions*. Accessed via <https://www.seed.nsw.gov.au/> (Data extracted February 2024).

NSW Government (2023). NSW SEED Mapping. Accessed via <https://www.seed.nsw.gov.au/>

OEH (Office of Environment and Heritage) (2018). *Threatened Species Test of Significance Guidelines.* State of New South Wales and Office of Environment and Heritage 2019.

Pizzey, G. & Knight, F. (2012). The field guide to the birds of Australia. (9th edn). HarperCollins Publishers, Australia.

PlantNET (The NSW Plant Information Network System) (2023) *Royal Botanic Gardens and Domain Trust, Sydney.* http://plantnet.rbgsyd.nsw.gov.au.

Robinson, L. (2003). *Field Guide to the Native Plants of Sydney*. 3rd edn. Kangaroo Press Pty. Ltd., New South Wales.

Triggs, B. (1996). *Mammal Tracks and Signs-A Field Guide for South-eastern Australia.* Oxford University Press, Melbourne.

Van Dyck, S. & Strahan, R. (Ed) (2008). *The Mammals of Australia*. 3rd edn. New Holland Publishers, Australia.

APPENDIX A

TOTAL FLORA LIST

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

The following standard abbreviations are used to indicate subspecific taxa:

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

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

V Vulnerable
E1 Endangered
E2 Endangered Population
E4A Critically Endangered Population

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

V Vulnerable
E Endangered
CE Critically Endangered

Serious and Irreversible Impact SAII

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

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

Weeds

Priorities under the Biosecurity Act 2015

G General Biosecurity Duty - any person dealing with plant matter must take measures to prevent, minimise or eliminate the biosecurity risk (as far as is reasonably practicable).
P Prohibition on dealings - Must not be imported into the State or sold.
R Regional Recommended Measure - Land managers mitigate the risk of the plant being introduced to their land. Land managers reduce impacts from the plant on priority assets. Land managers prevent spread from their land where feasible. The plant or parts of the plant are not traded, carried, grown or released into the environment.

NSW BC Act 2016

T Listed as a Threatening Process under the NSW BC Act 2016.

National

N Weed of National Significance (WoNS)

Table A1: Flora species recorded within the study area

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	WEEDS	FLOWERING PERIOD
MAGNOLIOPSIDA: Magnoliidae							
LILOPSIDA: (Monocotyledons)							
Commelinaceae							
Commelina cyanea	Scurvy Weed						
Cyperaceae							
**Cyperus eragrostis*	Umbrella Sedge						
Poaceae							
Aristida vagans	Three-awn Speargrass						
**Cenchrus clandestinus syn Pennisetum clandestinum*	Kikuyu						
Cynodon dactylon	Common Couch						
Echinopogon ovatus	Hedgehog Grass						
**Ehrhartia erecta*	Panic Veldt Grass						
Entolasia stricta	Wiry Panic						
**Melinis repens*	Red Natal Grass						
Microlaena stipoides var. *stipoides*	Weeping Meadow Grass						
**Paspalum dilatatum*	Paspalum						
**Setaria parviflora* syn. *Setaria gracillis*	Slender Pigeon Grass						
**Sporobolus africanus*	Parramatta Grass						
Sporobolus creber	Slender Rats Tail						
MAGNOLIIDAE (Dicotyledons)							
Asteraceae							
**Bidens pilosa*	Cobblers Pegs						
**Cirsium vulgare*	Spear Thistle						Sept
**Conyza bonariensis*	Flax-leaved Fleabane						
**Hypochaeris radicata*	Catsear, Flatweed						
**Senecio madagascariensis*	Fireweed						Sept, Oct
**Sonchus oleraceus*	Common Sow Thistle						
**Tagetes minuta*	Stinking Roger						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	WEEDS	FLOWERING PERIOD
**Taraxacum officinale*	Dandelion						
Campanulaceae							
Lobelia purpurascens	White Root						
Convolvulaceae							
Convolvulus erubescens	Australian Bindweed						
Dichondra repens	Kidney Weed						
Fabaceae Subfamily (Faboideae)							
Glycine tabacina sp. complex	Love Creeper						
**Trifolium repens*	White Clover						Sept, Oct
Gentianaceae							
**Cenaurium erythraea*	Common Centaury						
Lamiaceae							
**Stachys arvensis*	Stagger Weed						
Malvaceae							
**Malva parviflora*	Small-flowered Mallow						
**Sida rhombifolia*	Paddys Lucerne						
Myrtaceae							
Corymbia maculata	Spotted Gum						Mar, Apr
Eucalyptus crebra	Narrow-leaved Ironbark						Sept, Oct
Eucalyptus fibrosa subsp. *fibrosa*	Broad-leaved Ironbark						
Eucalyptus siderophloia	Grey Ironbark						
Eucalyptus tereticornis	Forest Red Gum						May, Aug, Sept, Oct
Oleaceae							
**Olea europaea* subsp. *cuspidata*	African Olive						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	WEEDS	FLOWERING PERIOD
Oxalidaceae							
**Oxalis sp.*							
Plantaginaceae							
**Plantago lanceolata*	Plantain						
Primulaceae							
**Lysimachia arvensis* syn. *Anagallis arvensis*	Scarlet Pimpernel						
Rubiaceae							
Pomax umbellata	Pomax						
**Richardia brasiliensis*	White Eye						
Verbenaceae							
**Lantana camara*	Lantana						Noxious
**Verbena bonariensis*	Purple Top						
**Verbena rigida* var. *rigida*	Veined Verbena						

APPENDIX B

DECISION-MAKING KEY FOR PLANTED NATIVE VEGETATION (APPENDIX D BAM 2020)

B1 D. 1 DECISION-MAKING KEY FOR PLANTED NATIVE VEGETATION (APPENDIX D BAM 2020)

Text in italics is copied directly from Appendix D (BAM 2020) and the most correct response to each criterion is underlined.

1: ***Does the planted native vegetation occur within an area that contains a mosaic of planted and remnant native vegetation and which can be reasonably assigned to a PCT known to occur in the same IBRA subregion as the proposal?***

i. Yes .... The planted native vegetation must be allocated to the best-fit PCT and the BAM must be applied.

ii. No..... Go to 2.

Justification:

Large areas of *Cybodon dactylon* (Common Couch) were present within the subject land. These areas lacked structural components and complexity to reasonably be able to assign a PCT. All tree/shrub species recorded on site that can be reasonably assigned to a PCT have been.

2: *Is the planted native vegetation:*

a. planted for the purpose of environmental rehabilitation or restoration under an existing conservation obligation listed in BAM Section 11.9(2.), and

b. the primary objective was to replace or regenerate a plant community type or a threatened plant species population or its habitat?

i. Yes .... The planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM.

ii. No..... Go to 3.

Justification:

The large areas of *Cybodon dactylon* (Common Couch) that lacked structural components and complexity were not planted for these reasons.

3. *Is the planted/translocated native vegetation individuals of a threatened species or other native species planted/translocated for the purpose of providing threatened species habitat under one of the following:*

a. a species recovery project

b. Saving our Species project

c. other types of government funded restoration project

d. condition of consent for a development approval that required those species to be planted or translocated for the purpose of providing threatened species habitat

e. legal obligation as part of a condition or ruling of court. This includes regulatory directed or ordered remedial plantings (e.g. Remediation Order for clearing without consent issued under the BC Act or the Native Vegetation Act)

f. ecological rehabilitation to re-establish a PCT or TEC that was, or is carried out under a mine operations plan, or

g. approved vegetation management plan (e.g. as required as part of a Controlled Activity Approval for works on waterfront land under the NSW Water Management Act 2000)?

i. Yes .... The planted native vegetation must be assessed in accordance with Chapters 4 and 5 of the BAM.

ii. No..... Go to 4.

Justification:

Planted native vegetation within the development site does not include any individuals of threatened species nor are the plantings associated with any of the above conservation projects.

4. Was the planted native vegetation (including individuals of a threatened flora species) undertaken voluntarily for revegetation, environmental rehabilitation or restoration without a legal obligation to secure or provide for management of the native vegetation?

i. Yes..... Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).

ii. No..... Go to 5.

Justification:

No. The large areas of *Cybodon dactylon* (Common Couch) present within the subject land was not present for these reasons.

5. Is the native vegetation (including individuals of a threatened flora species) planted for functional, aesthetic, horticultural or plantation forestry purposes? This includes examples such as: windbreaks in agricultural landscapes, roadside plantings (including street trees, median strips, roadside batters), landscaping in parks, gardens and sport fields/complexes, macadamia plantations or teatree farms?

i. Yes .... Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).

ii. No..... Go to 6.

Justification:

No. The large areas of *Cybodon dactylon* (Common Couch) present within the subject land was not present for these reasons.

6. Is the planted native vegetation a species listed as a widely cultivated native species on a list approved by the Secretary of the Department (or an officer authorised by the Secretary)?

i. Yes … Go to D.2 Assessment of planted native vegetation for threatened species habitat (the use of Chapters 4 and 5 of the BAM are not required to be applied).

ii. No …. There may be other types of occurrences of planted native vegetation that do not easily fit into the decision-making key above. Assessors should contact the BAM Support mailbox at bam.support@environment.nsw.gov.au for further advice on using the BAM to assess other types of occurrences of planted native vegetation.

Justification:

The planted vegetation within the Subject Site is not planted native vegetation identified as being widely cultivated on a list approved by the Secretary of the Department (or an officer authorised by the Secretary).

B2 ASSESSMENT OF PLANTED NATIVE VEGETATION FOR THREATENED SPECIES HABITAT

If the application of D.1 justifies the application of the streamlined assessment under D.2 of the Module, the planted native vegetation is not required to be assessed under the standard BAM. However, the vegetation may still provide habitat for threatened flora and fauna species. If the answer to any one of Questions 4–6 is 'yes', assess the suitability of the planted native vegetation for use by threatened species (both ecosystem and species-credit species).

While it is not required to survey these areas strictly in accordance with the BAM, it is expected that a reasonable understanding of habitat suitability for threatened species is provided…

This may require rapid vegetation and habitat assessments and transects to identify any notable habitat features or evidence of threatened species occupation. Record any incidental sightings or evidence of threatened fauna species using, inhabiting or being part of the planted native vegetation.

The Assessment *must include the following:*

- *a summary of the survey effort undertaken in planted native vegetation (site inspection, habitat searches, walking transects, survey dates)*

Section 4.2 of this report details survey effort and dates. Survey effort is also shown in Figure B1.

- *a description of any habitat features in the planted native vegetation (e.g. hollows/nest boxes, fissures, stags, hollow logs, feeding resources, leaf litter)*

No habitat features were observed within the planted native vegetation (Couch grasslands)

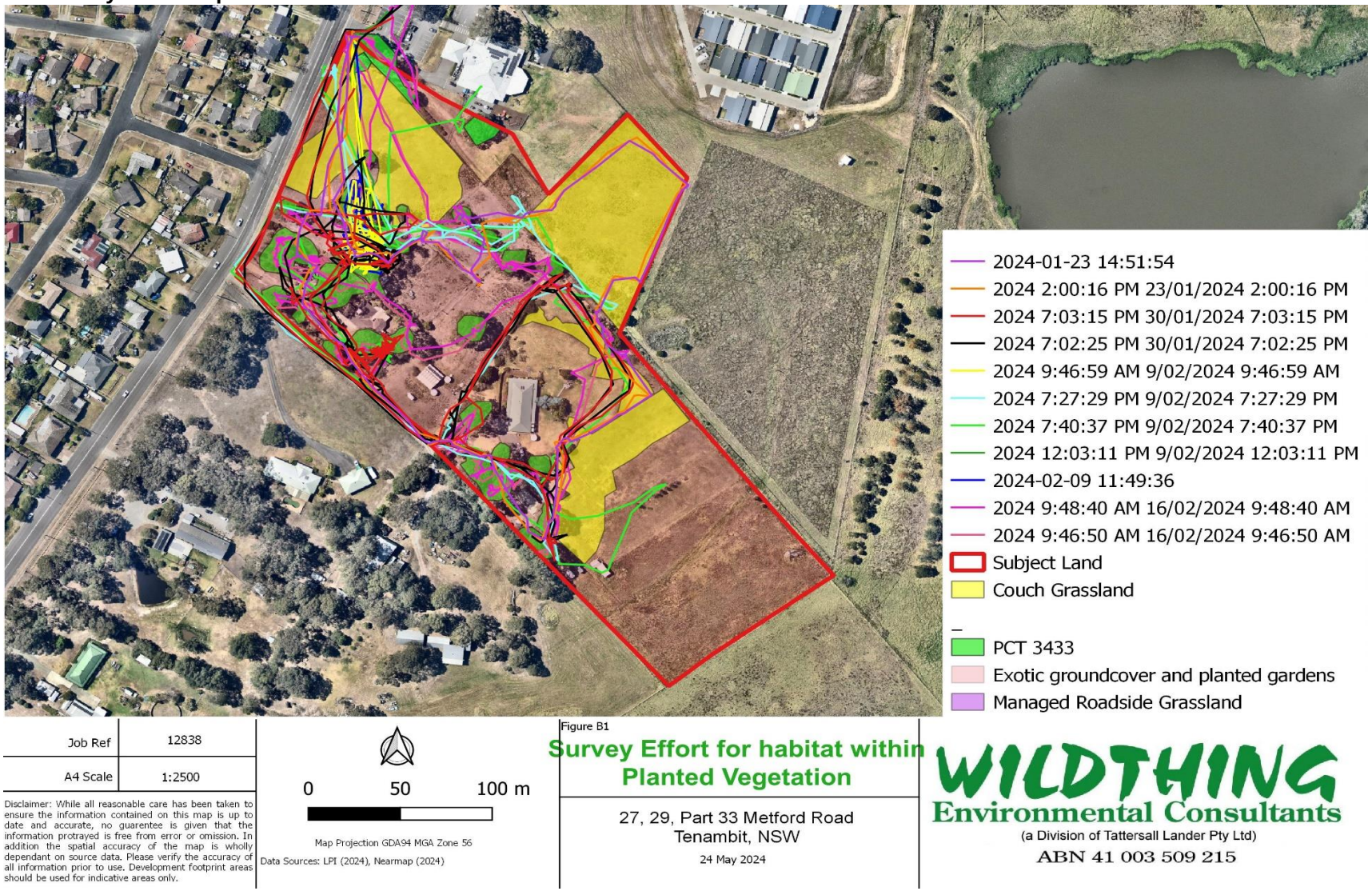
- *a description of any evidence of potential threatened species occupation (e.g. scats, stick nests, scratchings, tracks, pellets)*

No evidence of threatened species occupation was observed within the planted native vegetation (Couch grasslands). White-Bellied Sea Eagle was observed hunting within the airspace above the subject land and was therefore assessed further within this report.

- *a summary of the threatened species (ecosystem and species credit) recorded in the locality and the likelihood of their occupation in the planted native vegetation.*

A summary of threatened species (ecosystem and species credit) recorded in the locality and the likelihood of their occupation in the planted native vegetation was completed within Table 5.5 of this report.

Figure B1 Survey Effort Map



APPENDIX C

SURVEYED TREE DATA

Significant Tree Data Key for Table C1.

- ***DBH** – Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level).
- ***Tree Height** –(m)
- **Coordinates** - **GDA – 2020, MGA 56**
- **Habitat/Hollows** –

  Class 1 – very large sized hollow openings (i.e., >20cm) suitable for species such as Owls

  Class 2 – large sized hollow openings (i.e., 15-20cm) suitable for species such as Owls and Possums

  Class 3 – medium sized hollow-openings (i.e., 5-15cm) suitable for species such as Gliders and Possums

  Class 4 – small sized hollow openings (i.e., <5cm) suitable for species such as microchiropteran bats.

  Spout - Hollow opening towards sky offering little protection from the weather

  Arboreal Termite Nest – provides potential nesting opportunities for hollow-dependent birds, such as kingfishers and kookaburras

Table C1: Details of trees within the study area.

Tree No.	Survey Number		Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
								Class 1	Class 2	Class 3	Class 4		
1	101	537	*Eucalyptus tereticornis* Forest Red Gum	370575.3325	6376719.029	0.52, 0.43	17						**Yes**
2	102	538	*Eucalyptus siderophloia* Grey Ironbark	370577.464	6376713.397	0.17, 0.18, 0.36	16						**Yes**
3	103	539	*Corymbia maculata* Spotted Gum	370598.26	6376707.125	0.48	17						**Yes**
4	104	523	*E. siderophloia*	370582.5924	6376736.969	0.51	14						**Yes**
5	105	525	*E. siderophloia*	370581.7346	6376738.297	0.26	14						**Yes**
6	106	527	Planted tree	370575.083	6376752.616	0.15, 0.19	13						**Yes**
7	107	528	*Corymbia maculata* Spotted Gum	370578.9524	6376750.455	0.19, 0.25, 0.32	17					Scratches on bole of tree	**Yes**
8	108	526	*E. siderophloia*	370578.3968	6376742.463	0.56	17						**Yes**
9	109	522	African Olive	370594.0002	6376739.228	Multistem	4						**Yes**
10	110	574	*E. tereticornis*	370625.785	6376867.386	0.80	17						No
11	111	573	*E. tereticornis*	370627.6577	6376867.745	0.62	16						No
12	112	575	*E. tereticornis*	370634.1386	6376859.288	0.95	17						No
13	113	576	*C. glauca*	370646.8327	6376841.822	0.52	16						No
14	114	485	*C. maculata*	370624	6376799	0.64	16					Few scratches on bole of tree	**Yes**
15	115	486	*C. maculata*	370617.357	6376780.558	0.43	10					Many scratches on bole of tree	**Yes**
16	116	487	*C. maculata*	370614.3623	6376772.87	0.87	18						**Yes**

Tree No.	Survey Number		Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
								Class 1	Class 2	Class 3	Class 4		
17	117	488	*C. maculata*	370620.7784	6376762.748	0.13, 0.15, 0.20	10					Lots of leaking sap on bole and branches	**Yes**
18	118	489	*C. maculata*	370610.9753	6376766.952	0.37	15						**Yes**
19	119	490	*C. maculata*	370607.7935	6376759.149	0.26, 0.09	14						**Yes**
20	120	491	*C. maculata*	370603.9186	6376768.96	0.26	14						**Yes**
21	121	492	*C. maculata*	370581.4602	6376766.567	0.63	17					Scratches on bole of tree	**Yes**
22	122	521	*C. maculata*	370602.2986	6376728.136	0.33, 0.37, 0.40	16						**Yes**
23	123	535	*C. maculata*	370600.105	6376716.239	0.60	18					Scratches on bole of tree	**Yes**
24	124	536	*C. maculata*	370608.1084	6376713.908	0.63	18					Scratches on bole of tree	**Yes**
25	125	520	*C. maculata*	370627.2869	6376723.248	0.61	16					Scratches on bole of tree	**Yes**
26/HBT 1	126	501	*C. maculata*	370631.8285	6376741.831	1.29	20	1	3	1	2	Large scar at base. Dead spout. Scratches	**Yes**
27	127	502	*C. maculata*	370637.7499	6376740.133	0.35	13					Scratches on bole of tree	**Yes**
28	128	500	*E. siderophloia*	370627.8067	6376741.221	0.26	8					Scratches on bole of tree	**Yes**
29	129	498	*C. maculata*	370623.8329	6376744.162	0.45	18					Scratches on bole of tree	**Yes**

Tree No.	Survey Number		Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
								Class 1	Class 2	Class 3	Class 4		
30	130	499	*C. maculata*	370626.1965	6376742.418	0.35	12					Scratches on bole of tree	**Yes**
31	131	496	*C. maculata*	370623.1032	6376735.062	0.41	10					Scratches on bole of tree	**Yes**
32	132	495	*C. maculata*	370618.099	6376738.102	0.26	10					Scratches on bole of tree	**Yes**
33	133	497	*C. maculata*	370622.414	6376745.147	0.31	14					Scratches on bole of tree	**Yes**
34	134	493	*C. maculata*	370620.8081	6376746.009	0.61	12					Scratches on bole of tree	**Yes**
35/HBT 2	135	494	*C. maculata*	370610.6451	6376741.666	0.69	20		1	1	2	Many scratches. Balled up leaved seen in C4 hollow, C2 hollow had feathers on outer edge.	**Yes**
36	136	503	*C. maculata*	370632.8649	6376748.499	0.52	17					Scratches on bole of tree	**Yes**
37	137	504	*C. maculata*	370636.2112	6376750.309	0.43	16					Scratches on bole of tree	No. Retained within scope of development
38	138	506	*C. maculata*	370644.9709	6376747.207	0.34, 0.12	12					Scratches on bole of tree	**Yes**
39	139	507	*C. maculata*	370644.2323	6376767.72	0.38	11					Scratches on bole of tree	**Yes**

Tree No.	Survey Number		Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
								Class 1	Class 2	Class 3	Class 4		
40	140	508	*Eucalyptus grandis* Flooded Gum	370672.6373	6376767.086	0.74	16						**Yes**
41	141	509	*Eucalyptus robusta* Swamp Mahogany	370686.698	6376752.631	0.30, 0.41, 0.33	15					Scratches on bole of tree	**Yes**
42	142	510	*E. grandis*	370700.5033	6376736.071	1.07	17						**Yes**
43	143	511	*E. robusta*	370723.0197	6376741.244	0.18, 0.27, 0.42, 0.50	13						**Yes**
44	144	512	*C. maculata*	370683.8466	6376698.369	0.86	18					Scratches on bole of tree	**Yes**
45	145	515	*Syagrus romanzoffiana* Cocos Palm	370651.1955	6376701.16								**Yes**
46	146	514	*C. maculata*	370645.7761	6376692.668	0.47	15					Scratches on bole of tree	**Yes**
47	147	513	*C. maculata*	370648.521	6376690.594	0.64	17					Scratches on bole of tree	**Yes**
48	148	516	*S. romanzoffiana*	370646.3604	6376705.093								**Yes**
49	149	517	*S. romanzoffiana*	370642.4577	6376709.811								**Yes**
50	150	518	*S. romanzoffiana*	370636.1174	6376714.719								**Yes**
52	152	519	*S. romanzoffiana*	370630.9104	6376718.862								**Yes**
53/ HBT 4	153	544	*C. maculata*	370633.8382	6376688.293	0.50	18			1		Scratches on bole of tree	**Yes**
54/HBT 3	154	545	*C. maculata*	370634.0411	6376687.19	0.84	17		1	4	2	Big scratches. Open at base. Many	**Yes**

Tree No.	Survey Number		Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
								Class 1	Class 2	Class 3	Class 4		
												cracks and openings in scarred dead spout in trunk. Rainbow Lorikeets nesting in live C3 hollow	
55	155	543	*C. maculata*	370622.7771	6376688.372	0.83	19					Scratches on bole of tree	**Yes**
56	156	540	*Eucalyptus fibrosa* Red Ironbark	370606.9481	6376687.831	0.54, 0.48	18						**Yes**
60	160	567	*C. maculata*	370725.1316	6376586.36	0.78	19						**Yes**
61	161	548	*C. maculata*	370680.4677	6376648.432	0.88	20					Scratches on bole of tree	**Yes**
62	162	556	*C. maculata*	370696.8723	6376619.257	0.77	20						**Yes**
63	163	554	*C. maculata*	370690.9749	6376618.52	0.42	18						**Yes**
64	164	549	*C. maculata*	370685.3765	6376623.764	0.55	18						**Yes**
65	165	551	*C. maculata*	370687.2634	6376615.804	0.38	18						**Yes**
66	166	550	*C. maculata*	370684.8868	6376618.543	0.71	20						**Yes**
67	167	553	*C. maculata*	370679.6352	6376611.048	0.45	17					Scratches on bole of tree	**Yes**
68	168	561	*C. maculata*	370691.6947	6376599.448	0.73	20						**Yes**
69	169	560	*C. maculata*	370697.8903	6376605.635	0.28	16						**Yes**
70	170	559	*C. maculata*	370699.2557	6376608.757	0.64	20						**Yes**
71	171	558	*C. maculata*	370698.3111	6376609.517	0.52	20						**Yes**
72	172	557	*C. maculata*	370698.172	6376612.954	0.38	20						**Yes**
73	173	565	*C. maculata*	370706.0328	6376613.725	0.62	18						**Yes**
74	174	568	*C. maculata*	370724.093	6376565.387	0.46	19						**Yes**
75	175	569	*S. romanzoffiana*	370734.231	6376671.746								**Yes**

Tree No.	Survey Number		Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
								Class 1	Class 2	Class 3	Class 4		
76	176	572	Fig Tree	370754.6965	6376698.075	0.16, 0.14, 0.12, 0.12	5						**Yes**
77	177	571	Fig Tree	370758.1467	6376691.911	0.35, 0.34, 0.46	6						**Yes**
78	178	505	*C. maculata*	370643.165	6376748.959	0.18	11					Scratches	**Yes**
79		524	*E. siderophloia*	370580.6073	6376738.607	0.13	8					Noisy minor active stick nest	**Yes**
80		529	*E. siderophloia*	370575.0118	6376750.849	0.22	14						**Yes**
81		530	Planted tree	370584.4555	6376752.525	0.22	13						**Yes**
82		531	*E. siderophloia*	370574.5128	6376745.74	0.23	13						**Yes**
83		532	*E. siderophloia*	370573.7188	6376742.179	0.12	7						**Yes**
84		533	*E. tereticornis*	370573.739	6376740.627	0.10	4						**Yes**
85		534	*E. siderophloia*	370575.1157	6376735.654	0.23	15						**Yes**
86		541	*E. siderophloia*	370606.8159	6376683.507	0.14	4						**Yes**
87		542	*E. siderophloia*	370612.6101	6376677.709	0.33	14						**Yes**
88		546	*Planted tree*	370667.5824	6376629.964	Multistem	3					Stick nest	**Yes**
89		547	*Planted tree*	370667.4506	6376632.843	Multistem	3					Stick nest	**Yes**
90		555	*C. maculata*	370692.6953	6376616.098	0.22	11						**Yes**
91		562	*C. maculata*	370691.9248	6376602.89	0.12	6						**Yes**
92		563	*Eucalyptus umbra*	370690.5059	6376603.875	0.28	15						**Yes**
93		564	*Casuaring glauca*	370699.8847	6376603.886	Miltistem	5						**Yes**
94		566	*E. tereticornis*	370714.8644	6376611.73	0.48	13						**Yes**
95		570	*E. siderophloia*	370763.2654	6376680.666	0.24	5						**Yes**

APPENDIX D

CONSIDERATIONS UNDER SECTION 7.3 OF THE BC ACT 2016

CONSIDERATIONS UNDER SECTION 7.3 OF THE BC ACT 2016

Considerations of the effects of the vegetation removal undertaken for the proposed development under *Section 7.3* of the BC Act (2016) for the following threatened species recorded within the study area during surveys are given below:

Endangered ecological communities recorded within the study area:

1. Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions

Threatened fauna species recorded within the site:

2.	*Pteropus poliocephalus*	Grey-headed Flying-Fox
3.	*Miniopterus australis*	Little Bentwing-bat
4.	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler
5.	*Haliaeetus leucogaster*	White-Bellied Sea Eagle

1 Five Part Test of Significance for Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. 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,*

Not applicable.

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,*

Approximately 0.51ha of vegetation consistent with the Endangered Ecological Community Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions was found to be present within the impact area.

This area of Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions will require removal to accommodate the proposal.

The proposal will result in an incremental reduction of Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions within the local area. However considering the current disturbance to this community within the site and taking into the consideration the recommendations the proposal is unlikely to significantly impact this endangered ecological community such that its local occurrence is likely to be placed at risk of extinction

c *in relation to the habitat of a threatened species or ecological community:*
   iii. *the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and*
   iv. *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and*
   v. *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,*

Approximately 0.51ha of Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions will require removal to accommodate the proposale. The proposal will result in an incremental reduction of Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and

NSW North Coast Bioregions within the local area. However taking into the consideration the recommendations the proposal is unlikely to result in the removal, modification, fragmentation or isolation of an area of habitat important to the long term survival of this Endangered Ecological Community.

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

No areas outstanding biodiversity value will be impacted by the proposal.

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

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the site have been listed in Table C.1.

Table C.1: Key Threatening Processes.

Key Threatening Process	Applicability in regards to the subject site
Clearing of Native Vegetation.	The proposal will require the removal of 0.51ha of native vegetation. Considering the recommendations pertaining to this EEC the proposed action is unlikely to be significant.
Invasion of native plant communities by exotic perennial grasses.	The proposed development will not result in a significant increase in edge effects impacting upon the retained vegetation. The majority of the site has been historically disturbed and as such edge effects have been an ongoing impact to the retained vegetation within the study area.
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	It is difficult to ascertain the disruption and structural changes, if any, past fires have caused the study area. The proposal is unlikely to result in a change in the frequency of fire in the local area.
Invasion, establishment and spread of Lantana (*Lantana camara*)	Lantana was recorded within the subject land. It is recommended that this weed be controlled as part of routine property maintenance.
Loss of Hollow-bearing Trees	Four hollow-bearing trees were recorded within the development footprint and all will require removal as a result of the proposed development. Nest boxes are to be installed into retained trees at a ratio of two nest boxes per hollow-bearing tree. The nest boxes are to be installed prior to tree clearance within retained trees. The artificial nest boxes should be installed onto a tree in the nearest adjacent area of similar habitat by a suitably qualified ecologist. This mitigation measure will ensure that no net loss of hollows will result from the proposed development.

2 Five Part Test of Significance for *Pteropus poliocephalus* (Grey-headed Flying-Fox)

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. 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,

Pteropus poliocephalus (Grey-headed Flying-Fox) were observed flying into the subject land and foraging on *Syagrus romanzoffiana* (Cocus Palm) during stag watching and spotlighting surveys. The treed areas within the subject land contained suitable foraging habitat for this megachiropteran bat species. No camps were observed within the subject land. The removal of vegetation from this site may result in an incremental loss in foraging habitat in the local area. Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) to search for Grey-headed Flying-Fox. If a Grey-headed Flying-Fox is located within the clearance area then a suitably qualified ecologist will be required to undertake a health assessment of the animal and relocate the specimen if healthy or take to a vet for treatment.

Taking into consideration the relatively large amount of suitable foraging habitat within the local area, the proposal is unlikely to disrupt the life cycle of *Pteropus poliocephalus* such that local extinction would occur.

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

vi. 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

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

Not applicable.

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

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

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

x. 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,

Foraging habitat for the Grey-headed Flying Fox will require removal to accommodate the proposal. The proposal will result in an incremental reduction of habitat for the Grey-headed Flying Fox within the local area. However taking into the consideration the recommendations the proposal is unlikely to

result in the removal, modification, fragmentation or isolation of an area of habitat important to the long term survival of the Grey-headed Flying Fox.

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

No areas outstanding biodiversity value will be impacted by the proposal.

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

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the site have been listed in Table C.2.

Table C.2: Key Threatening Processes.

Key Threatening Process	Applicability in regards to the subject site
Clearing of Native Vegetation.	The clearing of vegetation is listed as a major factor contributing to the loss of biological diversity. The removal of vegetation for the proposal will result in the removal of hunting habitat however for unlikely to result in a significant loss of habitat for this species.
Predation by the European Red Fox Vulpes vulpes	The Red Fox was not recorded within the site but would be considered to have an impact on native fauna in the local area. The proposal is unlikely to result in an increase in the number of this introduced species.
Predation by the Feral Cat Felis catus	The Feral Cat was not recorded within the study area at the time of the survey however would be considered to have an impact on native fauna in the local area. The proposal is unlikely to result in an increase in the number of this introduced species.
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	It is difficult to ascertain the disruption and structural changes, if any, past fires have caused the study area. Fire has the potential to cause direct mortality to Koalas and impact the availability of foraging habitat.

3 Five Part Test of Significance for *Miniopterus australis* (Little Bentwing Bat)

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. 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,

Miniopterus australis was positively identified within the site during the microchiropteran bat call survey. The entire site is likely to contain suitable hunting habitat for this microchiropteran bat species. Preferred roosting habitat in the form of caves was absent within the site, however man-made structures in the form of dwellings and associated infrastructure was located within the subject land. Roosting in the form of tree hollows was present within the study area. The removal of vegetation and 4 hollow-bearing trees from this site may result in an incremental loss in the quality of hunting and roosting habitat in the local area. . Nest boxes are to be installed into retained trees at a ratio of two nest boxes per hollow-bearing tree. The nest boxes are to be installed prior to tree clearance within retained trees. The artificial nest boxes should be installed onto a tree in the nearest adjacent area of similar habitat by a suitably qualified ecologist. This mitigation measure will ensure that no net loss of hollows will result from the proposed development.

Taking into consideration the relatively large amount of suitable hunting and roosting habitat retained within the local area, the absence of preferred roosting habitat within the site and the recommendation for compensatory nest boxes the proposal is unlikely to disrupt the life cycle of *M. australis* such that local extinction would occur.

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

xi. 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

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

Not applicable.

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

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

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

xv. 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,

Hunting habitat for the Little Bentwing Bat and up to 4 hollow-bearing trees will require removal to accommodate the proposal. The proposal will result in an incremental reduction of habitat for the Little Bentwing Bat within the local area. However taking into the consideration the recommendations the proposal is unlikely to result in the removal, modification, fragmentation or isolation of an area of habitat important to the long term survival of the Little Bentwing Bat.

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

No areas outstanding biodiversity value will be impacted by the proposal.

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

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the site have been listed in Table C.3.

Table C.3: Key Threatening Processes.

Key Threatening Process	Applicability in regards to the subject site
Clearing of Native Vegetation.	The clearing of vegetation is listed as a major factor contributing to the loss of biological diversity. The removal of vegetation for the proposal will result in the removal of hunting habitat however for unlikely to result in a significant loss of habitat for this species.
Predation by the European Red Fox Vulpes vulpes	The Red Fox was not recorded within the site but would be considered to have an impact on native fauna in the local area. The proposal is unlikely to result in an increase in the number of this introduced species.
Predation by the Feral Cat Felis catus	The Feral Cat was not recorded within the study area at the time of the survey however would be considered to have an impact on native fauna in the local area. The proposal is unlikely to result in an increase in the number of this introduced species.
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	It is difficult to ascertain the disruption and structural changes, if any, past fires have caused the study area. Fire has the potential to cause direct mortality to Koalas and impact the availability of foraging habitat.
Loss of Hollow-bearing Trees	Four hollow-bearing trees were recorded within the development footprint and all could potentially require removal as a result of the proposed development. Nest boxes are to be installed into retained trees at a ratio of two nest boxes per hollow-bearing tree. The nest boxes are to be installed prior to tree clearance within retained trees. The artificial nest boxes should be installed onto a tree in the nearest adjacent area of similar habitat by a suitably qualified ecologist. This mitigation measure will ensure that no net loss of hollows will result from the proposed development.

4 Five Part Test of Significance for *Pomatostomus temporalis temporalis* (Grey-crowned Babbler)

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. 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,

One tree was found to contain and unkempt Grey-crowned Babbler nests/roost. The western portion of the site is likely to contain suitable nesting habitat for this avifauna species. The removal of vegetation from this site may result in an incremental loss in nesting habitat in the local area. . The removal of Grey-crowned Babbler habitat will require the following:

- Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) to search for Grey-crowned Babbler nests. If a nest is located within the clearance area then a relocation plan is to be implemented.
- If any nests are found to contain eggs or nestlings no clearance works will be allowed within the vicinity of any of the nests until the young have fledged (Only the breeding female usually sits on the eggs, the remainder of the birds will roost in another nearby nest). The nests/roosts will likely require an Elevated Work Platform (EWP) to access the nest
- Once it is determined there is no active breeding nests, they will then be relocated by an ecologist into neighbouring trees which are to remain in-situ.

Taking into consideration the relatively large amount of suitable nesting habitat retained within the local area and the recommendations within this report, the proposal is unlikely to disrupt the life cycle of Grey-crowned Babbler such that local extinction would occur.

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

xvi. 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

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

Not applicable.

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

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

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

xx. 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,

Nesting habitat for the Grey-crowned Babbler will require removal to accommodate the proposal. The proposal will result in an incremental reduction of nesting habitat for the Grey-crowned Babbler within the local area. However taking into the consideration the recommendations the proposal is unlikely to result in the removal, modification, fragmentation or isolation of an area of habitat important to the long term survival of the Grey-crowned Babbler.

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

No areas outstanding biodiversity value will be impacted by the proposal.

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

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

Table C.4: Key Threatening Processes.

Key Threatening Process	Applicability in regards to the subject site
Clearing of Native Vegetation.	The clearing of vegetation is listed as a major factor contributing to the loss of biological diversity. The removal of vegetation for the proposal will result in the removal of hunting habitat however for unlikely to result in a significant loss of habitat for this species.
Predation by the European Red Fox Vulpes vulpes	The Red Fox was not recorded within the site but would be considered to have an impact on native fauna in the local area. The proposal is unlikely to result in an increase in the number of this introduced species.
Predation by the Feral Cat Felis catus	The Feral Cat was not recorded within the study area at the time of the survey however would be considered to have an impact on native fauna in the local area. The proposal is unlikely to result in an increase in the number of this introduced species.
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	It is difficult to ascertain the disruption and structural changes, if any, past fires have caused the study area. Fire has the potential to cause direct mortality to Koalas and impact the availability of foraging habitat.

5 Five Part Test of Significance for *Haliaeetus leucogaster* (White-Bellied Sea Eagle)

The objective of section 7.3 of the Biodiversity Conservation Act 2016 (BC Act), the test of significance, is to provide standardised and transparent consideration of threatened species and ecological communities, and their habitats, through the development assessment process. 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,

Haliaeetus leucogaster (White-Bellied Sea Eagle) was observed hunting within the immediate local area and briefly over the far east of the subject land. Surveys did not record any evidence of breeding in the form of large stick nests in trees within the subject land or in close proximity despite targeted searches. The removal of White-Bellied Sea Eagle habitat will require the following:

- Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) to search for White-Bellied Sea Eagle nests. If a nest is located within the clearance area then Maitland City Council is to be immediately notified and a plan is to be implemented.

Taking into consideration the relatively large amount of suitable hunting habitat retained within the local area and the recommendations within this report, the proposal is unlikely to disrupt the life cycle of White-Bellied Sea Eagle such that local extinction would occur.

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

xxi. 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

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

Not applicable.

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

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

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

xxv. 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,

Hunting habitat for the White-Bellied Sea Eagle will require removal to accommodate the proposal. The proposal will result in an incremental reduction of hunting habitat for the White-Bellied Sea Eagle within the local area. However taking into the consideration the recommendations the proposal is

unlikely to result in the removal, modification, fragmentation or isolation of an area of habitat important to the long term survival of the White-Bellied Sea Eagle.

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

No areas outstanding biodiversity value will be impacted by the proposal.

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

The 'Key Threatening Processes' currently listed under Schedule 4 of the BC Act 2016 that are relevant to the site have been listed in Table C.5.

Table C.5: Key Threatening Processes.

Key Threatening Process	Applicability in regards to the subject site
Clearing of Native Vegetation.	The clearing of vegetation is listed as a major factor contributing to the loss of biological diversity. The removal of vegetation for the proposal will result in the removal of hunting habitat however for unlikely to result in a significant loss of habitat for this species.
Predation by the European Red Fox Vulpes vulpes	The Red Fox was not recorded within the site but would be considered to have an impact on native fauna in the local area. The proposal is unlikely to result in an increase in the number of this introduced species.
Predation by the Feral Cat Felis catus	The Feral Cat was not recorded within the study area at the time of the survey however would be considered to have an impact on native fauna in the local area. The proposal is unlikely to result in an increase in the number of this introduced species.
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition	It is difficult to ascertain the disruption and structural changes, if any, past fires have caused the study area. Fire has the potential to cause direct mortality to Koalas and impact the availability of foraging habitat.

APPENDIX E

PLOT DATA AND PHOTOS

Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site – Field Survey Form | Plot Identifier:

Midline start	Midline end	Plot Size	Date	Plot Waypoint ID	Recorders
E- 370622 N- 6376790	E- 370618 N- 6376781	20×50	9/2/2024	Start - End -	EPLIE DARYL
Photo# # 1672	Photo# # 1674	IBRA region	SYDNEY BASIN		
Bearing 344°	Bearing 162°	Vegetation Class	HUNTER MACLEAY DRY SCLERO-PHYLL FOREST		
		Vegetation Zone	1A		
PCT # 3433	PCT Name				
Consistent BC ACT TEC?					

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
Sum of Cover of native vascular plants by growth form group	Trees	
	Shrubs	
	Grasses etc.	
	Forbs	
	Ferns	
	Other	
High Threat Weed cover		

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		0
50 – 79 cm	0·61, 0·87	
30 – 49 cm	✓	
20 – 29 cm	✓	
10 – 19 cm		
5 – 9 cm		
Regeneration < 5 cm	✓	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	1·4m	

Large Tree Sizes

Dry Sclerophyll Forests - ≥50, Forested Wetlands - ≥50, Freshwater Wetlands - NA, Grasslands - NA, Grassy Woodlands - ≥50, Heathlands - ≥30, Rainforests - ≥50, Saline Wetlands - NA, Semi-arid Woodland (grassy sub-formation) ≥30, Semi-arid woodlands (shrubby sub-formation) ≥30, Wet sclerophyll forests (grassy sub-formation) ≥79, Wetland sclerophyll forests (shrubby sub-formation) ≥79

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	80 60 60 70 20	0 5 10 30 5	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots				

Litter cover is assessed as the average percentage ground cover of litter recorded from five 1 m x 1 m plots centred at 5, 15, 25, 35, 45 m along the plot midline. Litter cover includes leaves, seeds, twigs, branchlets and branches (less than 10 cm in diameter). Assessors may also record the cover of rock, bare ground and cryptogams.

Physiography + site features that may help in determining PCT and Management Zone (optional)

Morphological Type		Landform Element		Landform Pattern		Microrelief	
Lithology		Soil Surface Texture		Soil Colour		Soil Depth	
Slope		Aspect		Site Drainage		Distance to nearest water and type	

Additional Plot Comments

Horses in paddock, horse droppings in plot

Wildthing Environmental Consultants - Office # (02) 49513311

400 m² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 9/2/2024		1A	KYLIE / DARYL

GF		Species	Cover	Abund	voucher
	1	Corymbia maculata	25	7	
	2	Eucalyptus sideraphoia	4	1	
	3	Cestrum parqui	11	100	
	4	Tecoma stans	8	35	
	5	Einadia hastata	1	50	
	6	Sida rhombifolia	0.5	50	
	7	Erthertia erecta	2	500	
	8	Passiflora caerulea	0.2	5	
	9	Phylanthus tenellus	0.2	30	
	10	Solanum mauritianum	0.2	5	
	11	Senecio madagascariensis	0.3	20	
	12	Dichondra repens	0.4	300	
	13	Modiola caroliniana	0.2	20	
	14	Asperula conferta	0.2	100	
	15	Cynodon dactylon	12	2000	
	16	Juncus bufonius	0.1	15	
	17	Portulaca oleracea	0.3	25	
	18	Chenopodium carinatum	0.2	30	
	19	Alternanthera pungens	0.2	25	
	20	Ricinus communis	0.2	2	
	21	Commelina cyanea	0.1	5	
	22	Sonchus oleraceus	0.1	5	
	23	Solanum nigra	0.3	20	
	24	Digitaria sanguinalis	0.3	25	
	25	Sedum ?	0.1	15	
	26	Eragrostis tenuifolia	0.2	15	seedling
	27	Conyza sp.	0.1	1	
	28	Glycine clandestina	0.2	50	
	29	Amaranthus retroflexus	0.2	10	
	30	Oxalis corniculata	0.1	1	
	31				
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Plate E1: Median Start Line of Plot 1A

Plate E2: Median end line of Plot 1A.

Figure E1 Plot Location Map