

**Biodiversity Development
Assessment Report**
for a
proposed subdivision
of
**Part Lots 141 & 142 DP 1225076
and
Lot 8 DP 855275
Mount Vincent Road & Wilton Drive
EAST MAITLAND NSW**



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Job No. 12503

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Document control

Version	Date	Author	Details
1	13/08/2024	Nicola Mohr	Biodiversity Development Assessment for the proposed development of Lot 141 DP 1225076 (No. 62) Mount Vincent Road, Lot 142 DP 1225076 (No. 145) Gullivers Lane and Lot 8 DP 855275 (No. 6) Wilton Drive, East Maitland NSW

Summary

Wildthing Environmental Consultants were engaged to undertake a Biodiversity Development Assessment Report (BDAR) for a proposed residential subdivision of Lot 141 DP 1225076 (No. 62) Mount Vincent Road, Lot 142 DP 1225076 (No. 145) Gullivers Lane and Lot 8 DP 855275 (No. 6) Wilton Drive, East Maitland NSW. This report has been prepared in accordance with the Biodiversity Assessment Method (BAM) to assess the biodiversity impact and offsetting obligation of the proposal under the Biodiversity Conservation Act 2016 (BC Act) and Biodiversity Conservation Regulation (BC Regulation).

The proponent Hunter Land proposes to subdivide the western side of Lot 141 DP 1225076 and all of Lot 8 DP 855275. The proposed subdivision will result in 77 new lots and include 5 interior roads, a detention basin to the south within Lot 142 DP 1225076 and required Bushfire Asset Protection Zones (APZ's). The shape of the proposed development is such that the majority of APZ will be positioned over grassland including parts of the existing maintained electrical easement. This has minimised the impact on native vegetation particularly trees requiring removal for the Bushfire APZ. Lot 141 DP 1225076 has undergone recent rezoning and is zoned R1 General Residential. The remainder of the study area is zoned C3 Environmental Management while Lot 142 DP 1225076 is zoned RU2 Rural Landscape and Lot 8 DP 855275 is zoned R1 General Residential.

The 32.12ha study area consisting of Lot 141 DP 1225076, Lot 142 DP 1225076 and Lot 8 DP 855275 was located to the west of Mount Vincent Road and south of Wilton Drive, East Maitland. The study area had been subject to disturbances from past vegetation clearance, ongoing cattle grazing, historical coal mining activities and weed incursion. Native vegetation in the form of open forest/woodland covered the majority of the higher ground in the eastern portion of the study area. The lower western portion of the subject land had undergone a higher level of disturbance and was largely composed of native derived grassland and introduced pasture with a small some remnant trees.

The 9.20ha operational footprint and construction footprint (subject land) is positioned within the west of the study area within areas that have previously been subjected to high levels of disturbance.

A total of 3.95ha of native vegetation was present within the subject land. A large portion of the subject land was covered by maintained introduced pasture grasses. A total of four Plant Community Types (PCT's) were identified within the subject land (Table E1). Three of these PCT's were consistent with Endangered Ecological Communities.

Table E.1 PCTs and EECs identified within the subject land

PCT ID	PCT name	TEC	Subject land area (ha)
PCT 3444	Lower Hunter Spotted Gum-Ironbark Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	2.78
PCT 3328	Lower Hunter Red Gum-Paperbark Riverflat Forest	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	0.48
PCT 3446	Lower North Foothills Ironbark-Box-Gum Grassy Forest		0.50
PCT 3975	Southern Lower Floodplain Freshwater Wetland	Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	0.19
Total area			3.95

Threatened Species

Targeted threatened species surveys identified nine threatened species listed under the BC Act within the subject land:

- *Petaurus norfolcensis* (Squirrel Glider) was likely detected during camera trapping and spotlighting. The Squirrel Glider is a species credit species and was offset with species credits;
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Micronomus norfolcensis* (Eastern Coastal Free-tailed Bat) and *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat) were detected during the bat call surveys. These species are ecosystem credit species and were offset under ecosystem credits generated for the clearing of native vegetation.
- *Miniopterus australis* (Little Bent-winged Bat), *Miniopterus orianae oceanensis* (Large Bent-winged Bat) were detected during the bat call surveys. These species are dual credit species (species credit species and ecosystem credit species). The breeding habitat constraint for these species (caves, tunnels, mines, culvert and other structures) were not present within the subject land, therefore species credits were not generated. These species were offset under ecosystem credits generated for the clearing of native vegetation
- *Myotis macropus* (Southern Myotis) was detected during the bat call surveys. This species is a species credit species as the subject land occurs within 200m of surface water and was offset with species credits.
- *Pteropus poliocephalus* (Grey-headed Flying Fox) was observed flying over the subject land during surveys. These species are dual credit species (species credit species and ecosystem credit species). As no breeding camps were present, species credits were not generated. This species was offset under ecosystem credits generated for the clearing of native vegetation
- *Pterostylis chaetophora* was recorded within the north-east of the study area well outside of the subject land. This species is a species credit species and was offset with species credits.

Serious and irreversible impacts (SAIL)

Three candidate SAIL entities *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Miniopterus orianae oceanensis* and *Miniopterus australis* were recorded within the subject land however no preferred breeding habitat was present. Therefore, the proposal was not found to impact these SAIL entities.

Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance

Considerations have been made under the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance. No nationally listed Threatened Ecological Communities were found to occur in the subject land. One nationally listed species *Pteropus poliocephalus* (Grey-headed Flying Fox) was observed flying overhead during surveys and would utilize seasonally flowering myrtaceous species within the subject land for foraging. It is unlikely that any of the nationally addressed or migratory listed species will be significantly impacted by the proposal

Koala

The subject land was found to fall under 'Chapter 4 Koala Habitat Protection 2021' of the SEPP (Biodiversity and Conservation) 2021. Habitat on site was considered suitable koala habitat due to the presence of a number of species of Koala Use Trees. Considering this and nearby koala records the subject land could be considered Core Koala Habitat. Further surveys were undertaken for Koala as a species credit species including three Koala Spot Assessment Technique surveys. No evidence of koalas was found during any surveys conducted.

Direct impacts requiring offsetting

Table E2 lists Ecosystem Credit Species requiring offsetting as a result of the proposal and Table E3 lists Species Credit Species requiring offsetting as a result of the proposal.

Table E2 Impacts that require an offset – ecosystem credits

PCT	TEC/EC	Impact area (ha)	Number of ecosystem credits required
PCT 3444 - Lower Hunter Spotted Gum-Ironbark Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	2.80	32
PCT 3328 - Lower Hunter Red Gum-Paperbark Riverflat Forest	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	0.48	6
PCT 3975 - Southern Lower Floodplain Freshwater Wetland	Freshwater wetlands on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions	0.19	5

Table E3 Impacts that require an offset – species credits

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
<i>Pterostylis chaetophora</i>	<i>Pterostylis chaetophora</i>	0.87ha	17
Squirrel Glider	<i>Petaurus norfolcensis</i>	0.87ha	17
Southern Myotis	<i>Myotis macropus</i>	3.34ha	34

A number of mitigation measures have been given for the construction and operational phase including:

- Clearing limits will be clearly marked to prevent unnecessary clearing beyond the extent of the development footprint. Tree clearing and disturbance will be limited to the development site
- A suitably qualified and experienced ecologist should be engaged to supervise removal of all significant habitat features (habitat trees, dams, ground habitat)
- Habitat salvage within the development footprint should be undertaken prior to and during clearance activities
- A Vegetation Management Plan (VMP) has been recommended for the retained vegetation within the study area outside the area of the proposed future Stage 4 area. It will prioritise the ongoing ecological viability of the retained areas of vegetation by protecting the ecological biodiversity and habitat values of the land.

Conclusion

The proposal will result in an incremental loss of habitat for a number of the addressed threatened species occurring within the local area. Taking into account the recommendations to minimise and manage impacts within the report and the offsetting obligation it is believed that the proposal is unlikely to have a significant impact of threatened communities, endangered populations or threatened species.

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Shortened forms

APZ	Asset Protection zone
BAM	Biodiversity Assessment Method
BAM-C	Biodiversity Assessment Method Calculator
BC Act	Biodiversity Conservation Act 2016 (NSW)
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BDAR	Biodiversity Development Assessment Report
BCAR	Biodiversity Certification Assessment Report
BOAMS	Biodiversity Offsets and Agreement Management System
BOS	Biodiversity Offsets Scheme
CEEC	Critically Endangered Ecological Community
CKPoM	Comprehensive Koala Plan of Management
DCCEEW	Department of Climate Change, Energy the Environment and Water
DBH	Diameter at Breast height over bark
DPE	Department of Planning and Environment
EC	Ecological Community listed under the EPBC Act
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EP&A Act	Environmental Planning and Assessment Act 1979 (NSW)
EEC	Endangered Ecological Community
HTW	High Threat Weed
IBRA	Interim Biogeographic Regionalisation for Australia
LLS Act	Local Land Services Act 2013 (NSW)
MNES	Matters of National Environmental Significance
NPW Act	National Parks and Wildlife Act 1974 (NSW)
NSW	New South Wales
PCT	Plant Community Type
PSC	Port Stephens Council
SAII	Serious and Irreversible Impact
SEARs	Secretary's Environmental Assessment Requirements
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VEC	Vulnerable Ecological Community
VMP	Vegetation Management Plan
Vegetation SEPP	State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (NSW)

Declarations

i. Certification under clause 6.15 *Biodiversity Conservation Act 2016*

I certify that this report has been prepared based on the requirements of, and information provided under, the Biodiversity Assessment Method and clause 6.15 of the Biodiversity Conservation Act 2016 (BC Act).



Signature:

Date: 13/08/2024

BAM Assessor Accreditation no: BAAS23007

This BDAR has been prepared to meet the requirements of BAM 2020. Appendix A provides an assessment of compliance with the minimum information requirements outlined in BAM Appendix K.

The lead or responsible assessor for the project must certify in the BDAR that the report has been prepared on the basis of the requirements of, and information provided under the BAM as at a specified date, and that date is within 14 days of the date the report is submitted to the decision-maker.

ii. Details and experience of author/s and contributors

Authors and contributors

Name	BAM Assessor Accreditation no. (if relevant)	Position/Role	Tasks performed	Relevant qualifications
Daryl Harman	BAAS17074	Senior Ecologist	Targeted threatened species surveys BAM plot surveys Report preparation Targeted threatened flora surveys	BEnvSc
Dr Kylie Bridges	BAAS20005	Ecologist	Targeted threatened species surveys. Targeted threatened flora surveys BAM plot surveys Report preparation	BEnvSc Hons PhD
Nicola Mohr	BAAS23007	Ecologist	Targeted threatened species surveys BAM plot surveys Figure preparation Targeted threatened flora surveys BAM-C data entry and analysis Report preparation	BSc & MSc
Mungo Worth	N/A	Ecologist	Bat Call Analysis	

iii. Conflict of interest

I declare that I have considered the circumstances and there is no actual, perceived or potential conflict of interest OR I wish to openly declare the following actual, perceived or potential conflict of interest and the management strategies employed:

This declaration has been made in the interests of full disclosure to the decision-maker. Full disclosure has also been provided to the client.



Signature:

Date: 13/08/2024

BAM Assessor Accreditation no: BAAS23007

Stage 1: Biodiversity Assessment

1.0 Introduction

1.1 Proposed development

1.1.1 Development overview

It is proposed that a subdivision be undertaken within the western portion of the Lot 141 DP 1225076 (No. 62) Mount Vincent Road, Lot 142 DP 1225076 (No. 145) Gullivers Lane and Lot 8 DP 855275 (No. 6) Wilton Drive, East Maitland NSW. This assessment forms part of a development application that requires consent under Part 4 of the NSW Environmental Planning and Assessment Act 1979 (EPA Act).

1.1.2 Location and Description of the Subject Land and Study Area

The study area consisted of Lot 141 DP 1225076 (No. 62) Mount Vincent Road, Lot 142 DP 1225076 (No. 145) Gullivers Lane and Lot 8 DP 855275 (No. 6) Wilton Drive, East Maitland NSW. The total area of the study area is 32.12ha. The study area was located to the west of Mount Vincent Road and South of Wilton Drive, East Maitland. The study area contained remnants of agricultural activity in the form of an old open shed, piles of debris and bricks, tires, troughs and a cattle yard with chute. Livestock historically and currently graze the subject land. Native vegetation in the form of open forest/woodland covered the majority of the eastern portion of the subject land. This area of native vegetation is also consistent with the Endangered Ecological Community; Lower Hunter Spotted Gum Ironbark Forest of the Sydney Basin and North Coast Bioregions which is listed under the Biodiversity Conservation Act. Although the area of open forest was found to be in generally good condition it had been subject to disturbances from past vegetation clearance, cattle grazing, historical coal mining activity and weed invasion particularly in the form of *Lantana camara* (Lantana). The lower western portion of the subject land had undergone a high level of disturbance and was largely composed of grassland/pasture with some remnant trees and has been subject to ongoing cattle grazing.

Lot 141 DP 1225076 has undergone recent rezoning and the western portion is zoned R1 General Residential. The remainder of the study area is zoned C3 Environmental Management while Lot 142 DP 1225076 is zoned RU2 Rural Landscape and Lot 8 DP 855275 is zoned R1 General Residential.

The subject land includes all of Lot 8 DP 855275, the R1 zoned area and a portion of C3 land to the west and south and east within Lot 141 DP 1225076 as well as a small area in the north-east of Lot 142 DP 1225076. The total area of the Subject Land is 9.20ha.

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

1.1.3 Development Description

The proponent proposes to subdivide the western side of Lot 141 DP 1225076 and all of Lot 8 DP 855275. The proposed subdivision will result in 77 new lots and include five interior roads, a detention basin to the south within Lot 142 DP 1225076 and required Bushfire Asset Protection Zones (APZ's). The 9.20ha operational footprint and construction footprint (subject land) is positioned within the area that has previously been subjected to high levels of disturbance. The shape of the proposed development is such that the majority of APZ is over grassland or the existing electrical easement. This has minimised the impact on native vegetation particularly trees requiring removal for the APZ.

Development plans have been provided in Figure 1.3 & 1.4.

Figure 1.1 Location Map

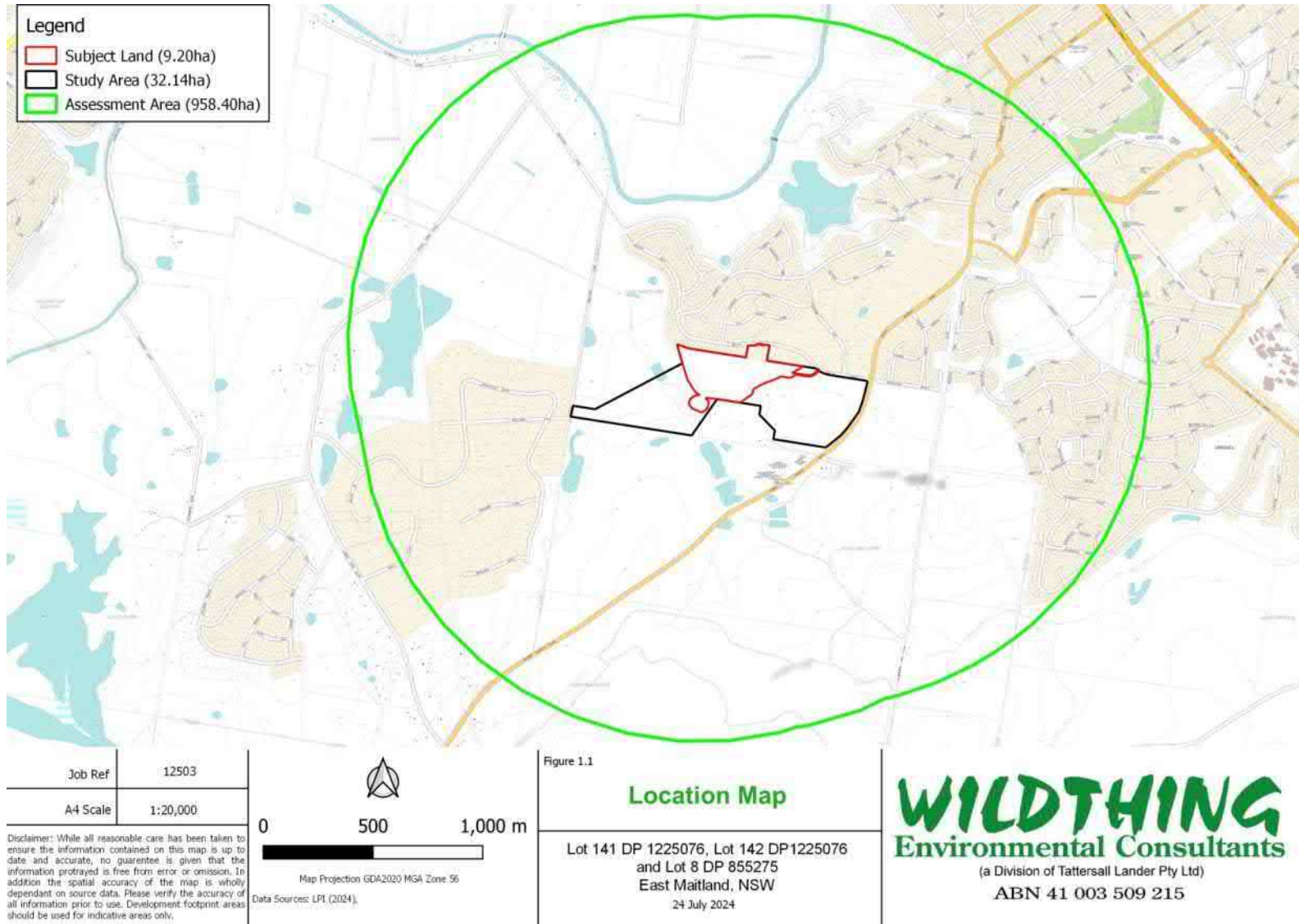


Figure 1.2 Aerial Image of Subject Land



Job Ref	12503
A4 Scale	1:5,000

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 portrayed 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.

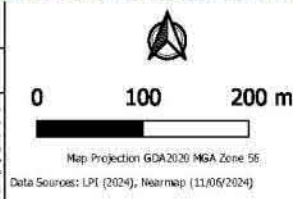
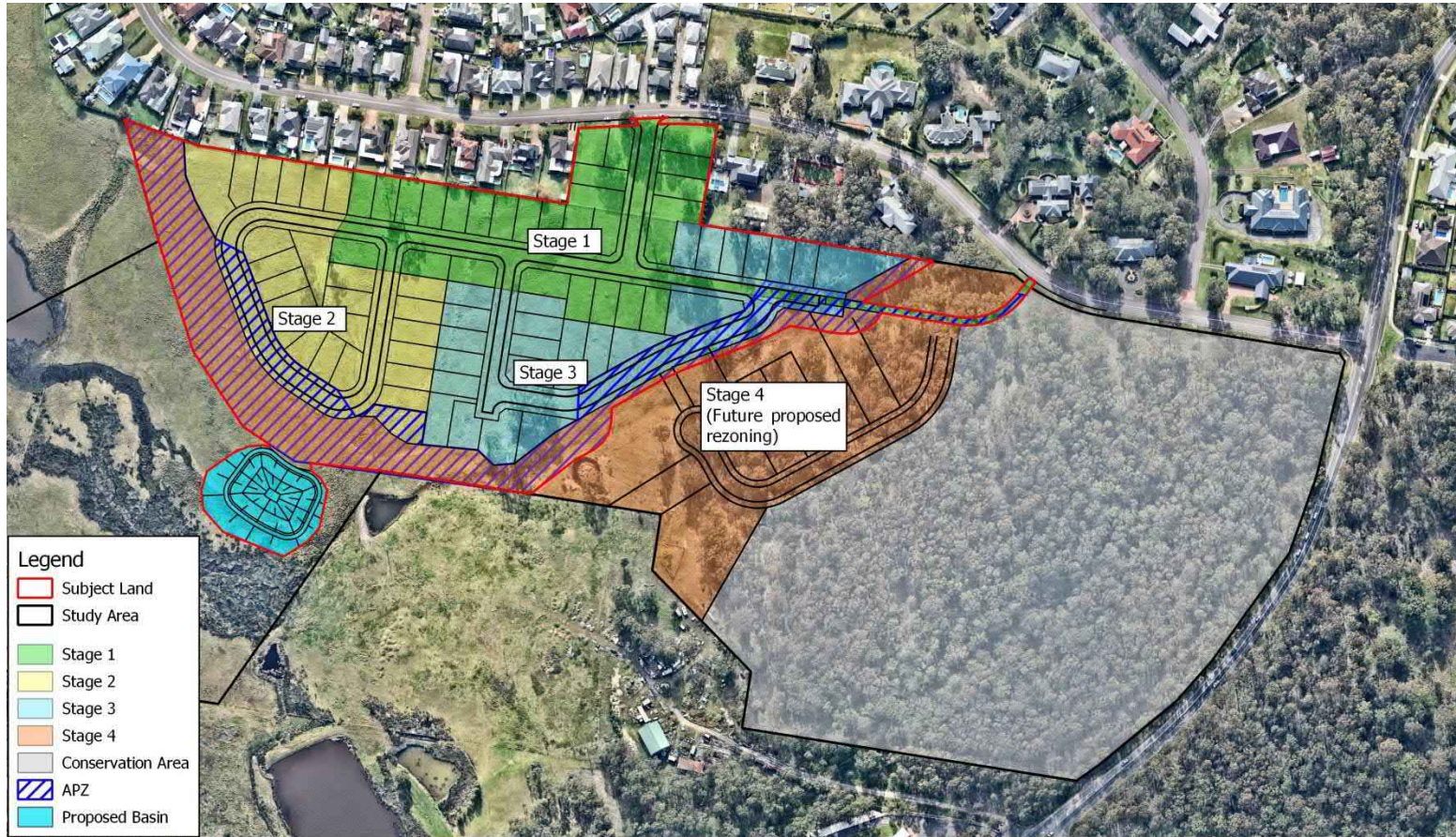


Figure 1.2
Aerial Image of Subject Land and Study Area
 Lot 141 DP 1225076, Lot 142 DP 1225076 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

(a Division of Tattersall Lander Pty Ltd)
 ABN 41 003 509 215

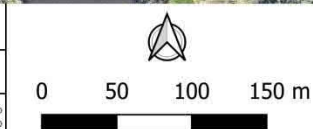
Figure 1.3 Design Plans



Legend

- Subject Land
- Study Area
- Stage 1
- Stage 2
- Stage 3
- Stage 4
- Conservation Area
- APZ
- Proposed Basin

Job Ref	12503
A4 Scale	1:3,500



Map Projection GDA2020 MGA Zone 56
 Data Sources: LPI (2024), Nearmap (11/06/2024)

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 portrayed 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 1.3

Development Plans

Lot 141 DP 1225076, Lot 142 DP 1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 9 August 2024

WILDTHING
 Environmental Consultants
 (a Division of Tattersall Lander Pty Ltd)
 ABN 41 003 509 215

Figure 1.4 Stag1-4 Design Plans



1.2 Legislative Context

1.2.1 NSW Environmental Planning and Assessment Amendment Act 2017

The Environmental Planning & Assessment Act 1979 (EP&A Act) was legislated to require the consideration and management of impacts of proposed development and land use change on the environment and the community.

- Part 1 Section 1.7 of the EP&A Act requires consideration of the proposed development under Part 7 of the Biodiversity Conservation Act 2016 (BC Act).
- The EP&A Act is also supported by other statutory environmental planning instruments, including State Environmental Planning Policies (SEPPs).

1.2.2 NSW Biodiversity Conservation (BC) Act 2016 & Biodiversity Offsets Scheme entry

In accordance with the BC Act, the Biodiversity Assessment Method (BAM) (DPIE 2020a) and entry into the Biodiversity Offsets Scheme (BOS) is applicable to certain development activities based on specific criteria. Preparation of a Biodiversity Development Assessment Report (BDAR) is required for a development application that meets any of the following criteria:

- Part 4 development activities deemed to be 'State Significant' under the NSW Environmental Planning and Assessment Act 1979 (NSW EP&A Act);
- Development activities that have the potential to impact Areas of Outstanding Biodiversity Value (AOBV) as listed under Part 3 of the BC Act.
- 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;
- 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); and
- Development activities that involve clearing of native vegetation that exceeds the Biodiversity Offset Scheme thresholds (BOS thresholds) as determined by the NSW BC regulation.

No areas of NSW Biodiversity Values are mapped within the subject land. The BOS clearing threshold for the subject land was 0.25ha. The area of the construction and operational footprint exceeds this threshold therefore triggering entry into the BOS. The criteria in relation to the proposal's entry into the Biodiversity Offsets Scheme is shown in Table 1.1. A map of the subject land showing the location of areas of Biodiversity Value is shown in Figure 1.6.

1.2.3 Serious and Irreversible Impacts

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 (SAIL entities) that are likely to be the subject of serious and irreversible impacts. Three candidate SAIL entities *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Miniopterus orianae oceanensis* and *Miniopterus australis* were recorded within the subject land, however no preferred breeding habitat was present. Therefore, the proposal was not found to impact these SAIL entities. No other candidate SAIL entities were found to be present within the study area thus no obligation for proposal refusal would be applicable to this proposed subdivision area from relevant regulatory bodies.

Table 1.1: Criteria for entry into the Biodiversity Offsets Scheme in relation to the proposal.

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.		No declared areas of outstanding biodiversity value were located within or in proximity to the subject land.
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;		No five-part test was undertaken.
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 1.2.2 Figure 1.5	The NSW Biodiversity Values Map Version 16.11 was first consulted on the 2 July 2024 it was found that mapped Biodiversity Values do not occur within the study area. The proposal would exceed the biodiversity offsets scheme threshold in regard to Section 7.2(b) of the BC Act.
Development activities that involve clearing of native vegetation that exceeds the Biodiversity Offset Scheme thresholds (BOS thresholds) as determined by the NSW BC regulation.		According to the BMAT Report, the clearing threshold for the subject land is 0.25ha. Up to 3.95ha native vegetation will require clearing. Consequently, the proposed development will exceed the biodiversity offsets scheme threshold in regard to Section 7.2(b) of the BC Act therefore a BDAR is required.

Figure 1.5 Biodiversity Values



Job Ref	12503
A4 Scale	1:12,000

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

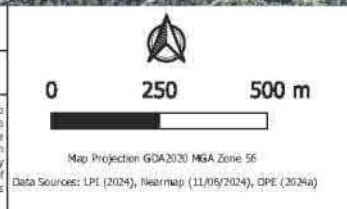


Figure 1.5
Biodiversity Values Mapping
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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1.2.4 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 following Chapters are relevant to Ecological Assessment reports:

- Chapter 4 Koala Habitat Protection 2021

1.2.4.1 Chapter 4 Koala Habitat Protection 2021

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

Land to which Chapter applies

- (1) This Chapter applies to each local government area listed in Schedule 2.
- (2) The whole of each local government area is—
 - (a) in the koala management area specified in Schedule 2 opposite the local government area, or
 - (b) if more than 1 koala management area is specified, in each of those koala management areas.
- (3) Despite subsection (1), this Chapter does not apply to—
 - (a) land dedicated or reserved under the National Parks and Wildlife Act 1974, or acquired under Part 11 of that Act, or
 - (b) land dedicated under the Forestry Act 2012 as a State Forest or a flora reserve, or
 - (c) land on which biodiversity certification has been conferred, and is in force, under Part 8 of the Biodiversity Conservation Act 2016, or
 - (d) land in the following land use zones, or an equivalent land use zone, unless the zone is in a local government area marked with an * in Schedule 2—

- (i) Zone RU1 Primary Production,
- (ii) Zone RU2 Rural Landscape,
- (iii) Zone RU3 Forestry.

The majority of the subject land is zoned R1 and C3 while the area of the proposed basin is zoned RU2. There are no trees present within the proposed basin location and it accounts for a relatively small area compared to the rest of the proposal. Therefore the proposal has entirely been assessed under Chapter 4 Koala Habitat Protection 2021. Further consideration is given in Section 12 of this report.

1.2.5 NSW Biosecurity Act 2015

The NSW Biosecurity Act 2015 (BS Act), amongst other considerations, provides regulatory controls and powers to manage noxious weeds in NSW. For weed management, this Act divides NSW into regions based on combined LGAs and priority weeds for a region are listed. Some weeds are managed at a state level as they form part of a broader containment strategy. The legislation compliments listed Weeds of National Significance (WoNS). Further information on this matter is provided in Section 14 of this report.

1.2.6 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance

The purpose of the Environment Protection and Biodiversity Conservation Act 1999 (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.

1.3 Excluded impacts

No excluded impacts (i.e., category 1-exempt land) were identified within the subject land.

1.4 Information sources

A list of the resources used to inform this BCAR, the date they were accessed and the spatial extent captured, where relevant, is provided in Table 1.2.

Table 1.2 Desktop Resources

Resource	Date Reviewed	Spatial Extent
Previous Ecological Studies		
Peak Land Management (2019). Biodiversity Development Assessment Report – Stage 1 – Land Rezoning Proposal – Part Lot 141 DP 1225076 Mount Vincent Road, East Maitland.	July 2024	Western portion of subject land.
Wildthing Environmental Consultants (2009) Proposed Rezoning Statement of Effect on Threatened Flora and Fauna, Wilton Drive & Mt Vincent Road, East Maitland NSW.	July 2024	Entire study area
Wildthing Environmental Consultants (2012) Proposed Rezoning at Lot 42 DP 846326 and Lot 1012 DP 1103879 Mt Vincent Road, East Maitland NSW. ACM Landmark Pty Ltd. August, 2012.	July 2024	Entire study area
Wildthing Environmental Consultants (2016) Statement of Effect on Threatened Flora and Fauna for a Proposed Subdivision at Lot 42 DP 846326 Wilton Drive & Mt Vincent Road, East Maitland NSW. ACM Landmark Pty Ltd. July, 2016.	July 2024	Entire study area
Wildthing Environmental Consultants (2016) Updated State of Effect on threatened flora and fauna for a proposed Seniors Living Development at Lot 42 DP 846326 and Lot 8 DP 855275 Wilton Drive and Mt Vincent Road East Maitland NSW	July 2024	Entire study area
Wildthing Environmental Consultants (2020). Vegetation/Habitat Comparison Report to inform future rezoning within Lot 141 DP 1225076 Mount Vincent Road, East Maitland NSW.	July 2024	Eastern portion of study area.
Wildthing Environmental Consultants (2021). Biodiversity Development Assessment for the proposed rezoning of part Lot 141 DP 1225076 (No. 62) Mount Vincent Road, East Maitland NSW.	July 2024	Eastern portion of study area.

Resource	Date Reviewed	Spatial Extent
Zoning and Regulatory Maps		
Maitland Local Environmental Plan 2011	July 2024	Entire study area
Biodiversity Values and Landscape Maps		
NSW Biodiversity Values Map (DPE 2024a)	2 July 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)	July 2024	Entire subject land
BioNet NSW (Mitchell) Landscapes – Version 3.1 (DPIE 2017)	July 2024	Entire subject land
NSW Interim Biogeographic Regions of Australia (IBRA region and sub-regions) – Version 7 (DAWE 2016)	July 2024	Entire subject land
Atlas of Groundwater Dependent Ecosystems (BoM 2012)	July 2024	Entire subject land
Nearmap	July 2024	
Threatened Species, Vegetation and Landscape Databases		
BioNet Atlas of NSW Wildlife (BioNet) (DPE 2023b)	2 July 2024	10x10km radius of subject land
Commonwealth Protected Matters Search Tool (PMST) (DCCEEW 2024a)	2 July 2024	10x10km radius of subject land
Commonwealth species profiles and threats database (SPRAT) (DCCEEW 2024b)	July 2024	-
NSW BioNet Threatened Biodiversity Profile Data Collection (DPE 2024b)	July 2024	
BioNet vegetation classification database (DPE 2024c)	July 2024	-
PlantNET NSW (PlantNET 2024).	July 2024	-
Directory of Important Wetlands in Australia (DIWA) (DoE 2015)	July 2024	-
Geological sites of NSW (Cartoscope 2021)	July 2024	-
Important habitat maps for a threatened species (DPE 2024)	July 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
DPE Koala (<i>Phascolarctos cinereus</i>) Biodiversity Assessment Method Survey Guide (DPE 2022)	Various dates	
NSW Survey Guide for Threatened Frogs (DPIE 2020d)	Various dates	-
DPIE Surveying threatened plants and their habitats NSW survey guide for the Biodiversity Assessment Method (DPIE 2020)	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)	January 2024	-
Climactic Data		
Maitland Airport Weather Station (BoM 2023)	Various dates	-
Development Footprint Design		
High Definition Design Pty Ltd (2024). Proposed Subdivision of Lot 141 & 142 DP1225076 & Lot 8 DP855275 Wilton Drive East Maitland. Overall Plan. Project No. HD374 Drawing No. HD02 Rev 9.	July 2024	
Peak Land Management (2024). Bushfire Assessment Report. East Maitland Land 62 Pty Ltd-proposed residential subdivision Part Lot 141 & Lot 8 Mt Vincent Rd & Wilton Drive East Maitland. July 2024	July 2024	

2.0 Methods

2.1 Site context methods

2.1.1 Landscape features

Landscape feature extent within the subject land were determined by undertaking searches of external resources such as NSW SEED Mapping (2024), LPI (2024), and NSW Planning Portal (2024). Field reconnaissance was also undertaken (Table 2.1) to determine the condition and extent of landscape features (Section 3.2) within the subject land and surrounding locality.

2.1.2 Native vegetation cover

The Biodiversity Assessment Method Operational Manual Stage 1 (DPIE, 2020b) defines 'Native Vegetation Cover' as:

The amount of native vegetation (woody and non-woody vegetation including regrowth and plantations comprised of plants native to New South Wales) that is estimated to remain in the landscape proximal to the assessment area. It is used:

- *as a filter by the Calculator to predict threatened species likely to occur or use habitat on a site; and*
- *to define the intrinsic rate of increase in species richness and plant cover as part of the assessment of future vegetation condition on a biodiversity stewardship site*

The percent native vegetation cover is assessed by applying a 1500 metre buffer around the edge of the subject land and digitising all native vegetation within, using GIS editing tools and recent aerial photography. The total area of native vegetation is calculated across the assessment area.

2.2 Native vegetation, threatened ecological communities and vegetation integrity methods

2.2.1 Existing information

Searches were undertaken of the BioNet VIS Database (DPE 2024c), NSW SEED mapping, 'The Natural Vegetation of Maitland Local Government Area (Hill, 2003) AND Updated vegetation mapping of Maitland City Council LGA (Maitland City Council, 2021).

2.2.2 Mapping native vegetation extent

Based on the results of the review of existing information and the requirements of the BAM with respect to this BDAR, appropriate surveys were designed for the subject land. Supplementary iterations and amendments were made to the base map throughout the fieldwork period, in accordance with Section 5.2 of the BAM, via hand-held GPS units and aerial photo interpretation. Iterations to the base map were based on observation of broad vegetation composition, landform,

physiography and on quantitative data collection through identification of all plants encountered to the species level. The vegetation types observed were compared to the base map and cross-referenced with the community profile descriptors (and diagnostic species tests) held within the BioNet VIS Database (DIPE 2021c) with an assessment of consistency being conducted.

2.2.3 Plot-based vegetation survey and Vegetation integrity survey

Detailed floristic surveys were undertaken in 2021 and July 2024. These surveys included the establishment of three plot-based vegetation and vegetation integrity plots. Data was collected in accordance with BAM Subsection 4.2.1 and 4.3.4 (BAM, 2020b) by persons trained in the BAM and under the direction of persons accredited under the BAM (see Section 4.3.1). The field data collected during the vegetation integrity assessment can be found in Appendix D along with photos of the BAM plots. Survey plot location was selected such that it included all functional attributes relevant to the PCT and vegetation zone. Figure 2.1 demonstrates the layout of a plot and details the survey methodology.

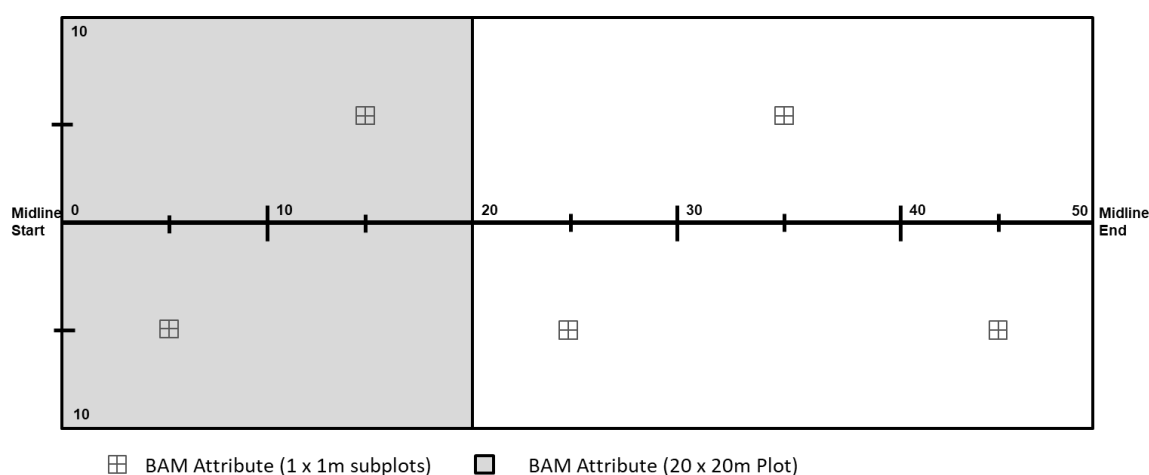


Figure 2.1: Plot Survey Design

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 leaf 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.

2.3 Threatened flora survey methods

2.3.1 Review of existing information

Habitat constraints for threatened species are identified in the BAM-CC and the Threatened Species Biodiversity Data Collection.

2.3.2 Habitat constraints assessment

Habitat constraints associated with threatened species were assessed for the subject land during field assessments.

2.3.3 Field surveys

2.3.3.1 Targeted Flora Surveys

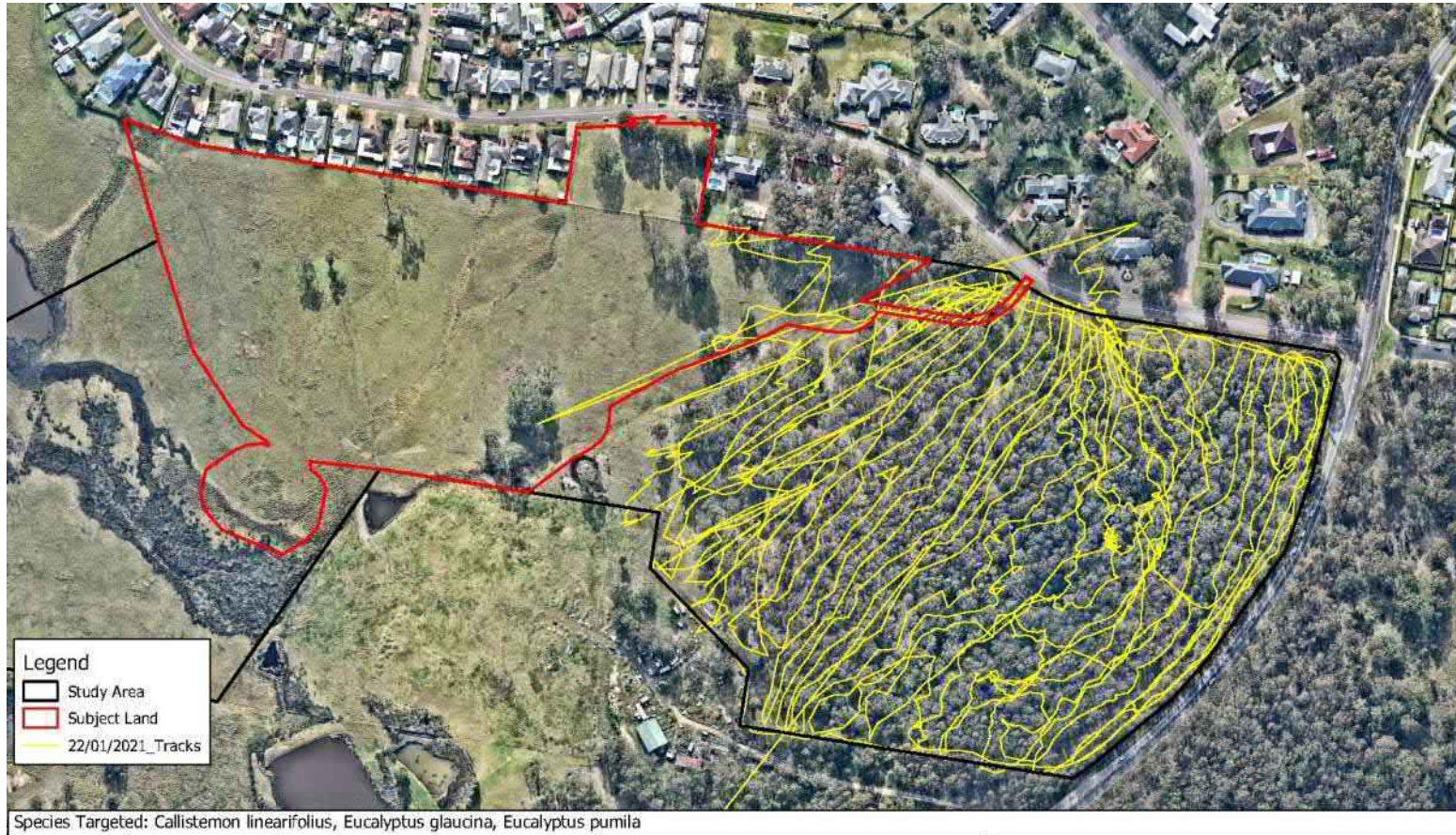
Targeted flora surveys were used in accordance with the NSW Guide to Surveying threatened plants and their habitats (DPIE 2020e), Draft survey guidelines for Australia's threatened orchids (DoE, 2013a). Each target threatened flora species was allocated areas of potential habitat. All vegetation communities considered to be habitat for the target species were searched. A parallel field traverse (i.e., parallel transects) were undertaken within the subject land. Surveys were conducted along parallel line transects approximately 5-10 metres apart for orchids, herbs and forbs, and 10 -20m for shrubs and trees. Transects were conducted along a straight path using the tracks on a GPS to guide the surveyors. Required survey times were stated in the BAM Candidate species report. Targeted surveys were undertaken for each flora species credit species within the required survey period identified in the BAM-CC.

The location of the targeted flora tracks is shown in Figure 2.2 and 2.3.

2.3.3.2 Significant Tree Survey

The significant tree survey involved a survey for hollow-bearing trees and trees containing large stick nests within and within close proximity to the impact area. 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. 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.

Figure 2.2 Targeted Flora Survey Tracks (January 2021)



Job Ref	12503
A4 Scale	1:3,500

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 portrayed 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.

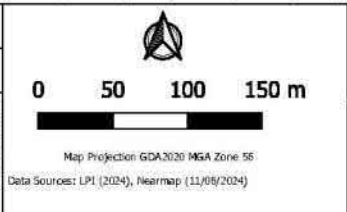


Figure 2.2
**Targeted Flora Searches
 January**

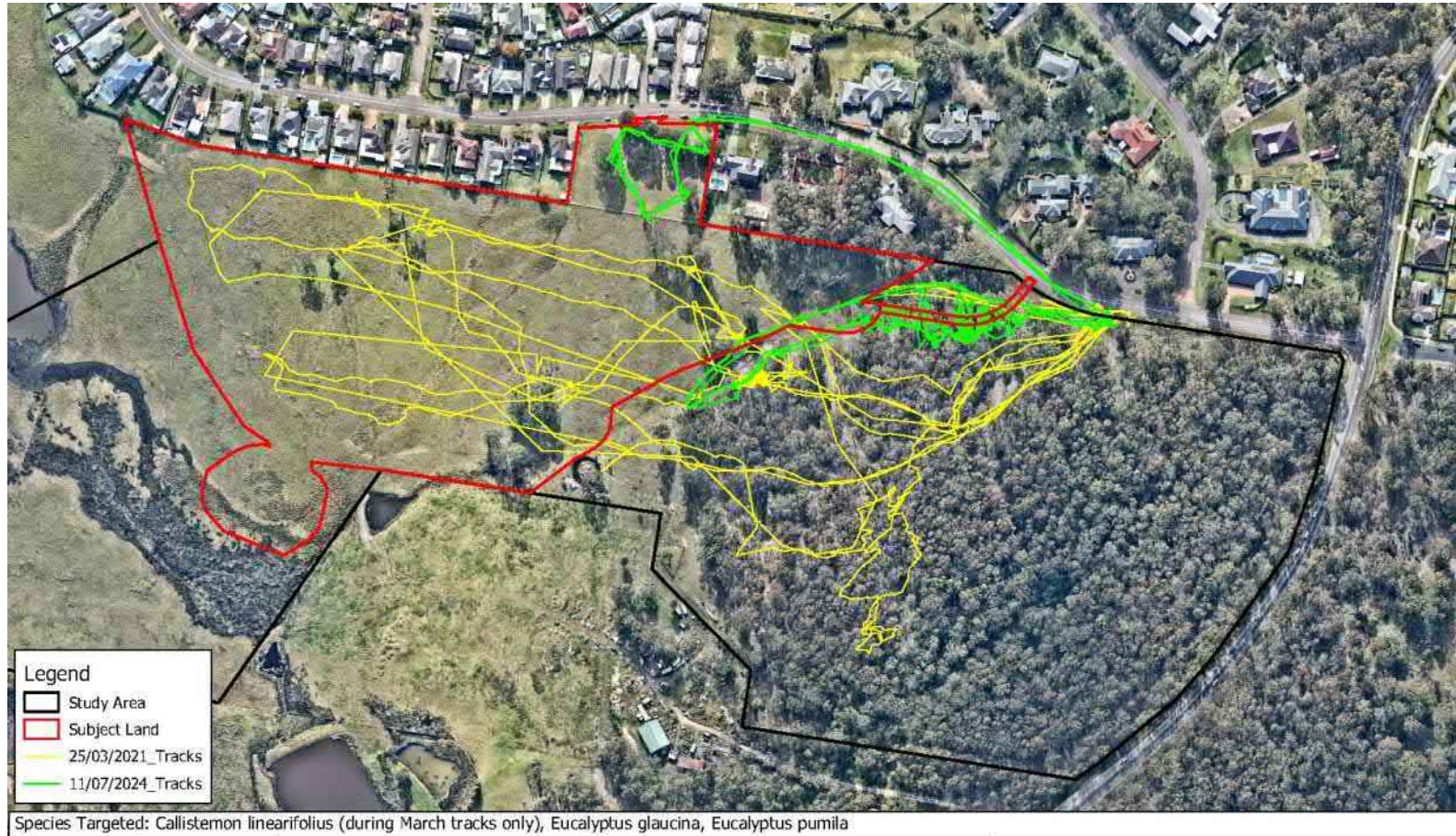
Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW

24 July 2024

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Figure 2.3 Targeted Flora Survey Tracks (March 2021 and July 2024)



Job Ref	12503
A4 Scale	1:3,500

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 portrayed 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.

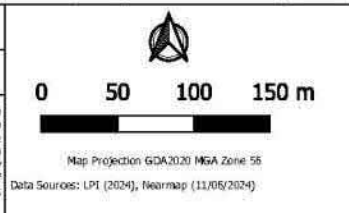


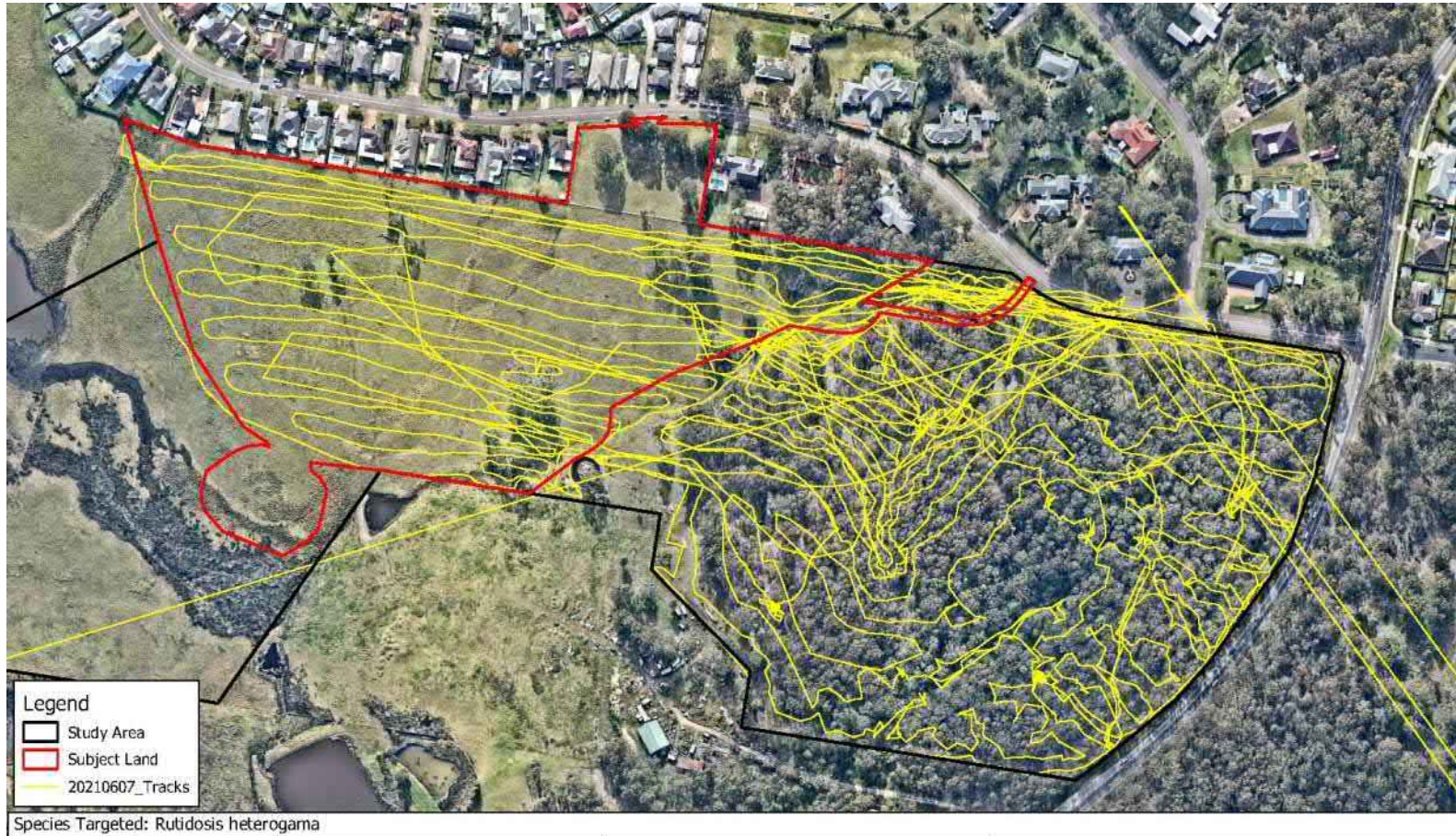
Figure 2.2
Targeted Flora Searches
 March and July

Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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Figure 2.4 Targeted Flora Survey Tracks (June 2021)



Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

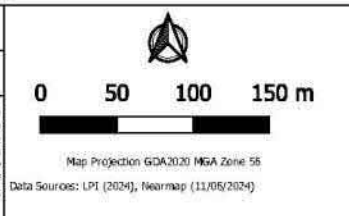


Figure 2.4
**Targeted Flora Searches
 June**

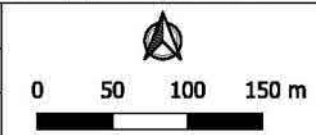
Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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Figure 2.5 Targeted Flora Survey Tracks (August 2021)



Job Ref	12503
A4 Scale	1:3,500



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 portrayed 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.

Map Projection GDA2020 MGA Zone 56
 Data Sources: LPI (2024), Nearmap (11/06/2024)

Figure 2.5
**Targeted Flora Searches
 August**

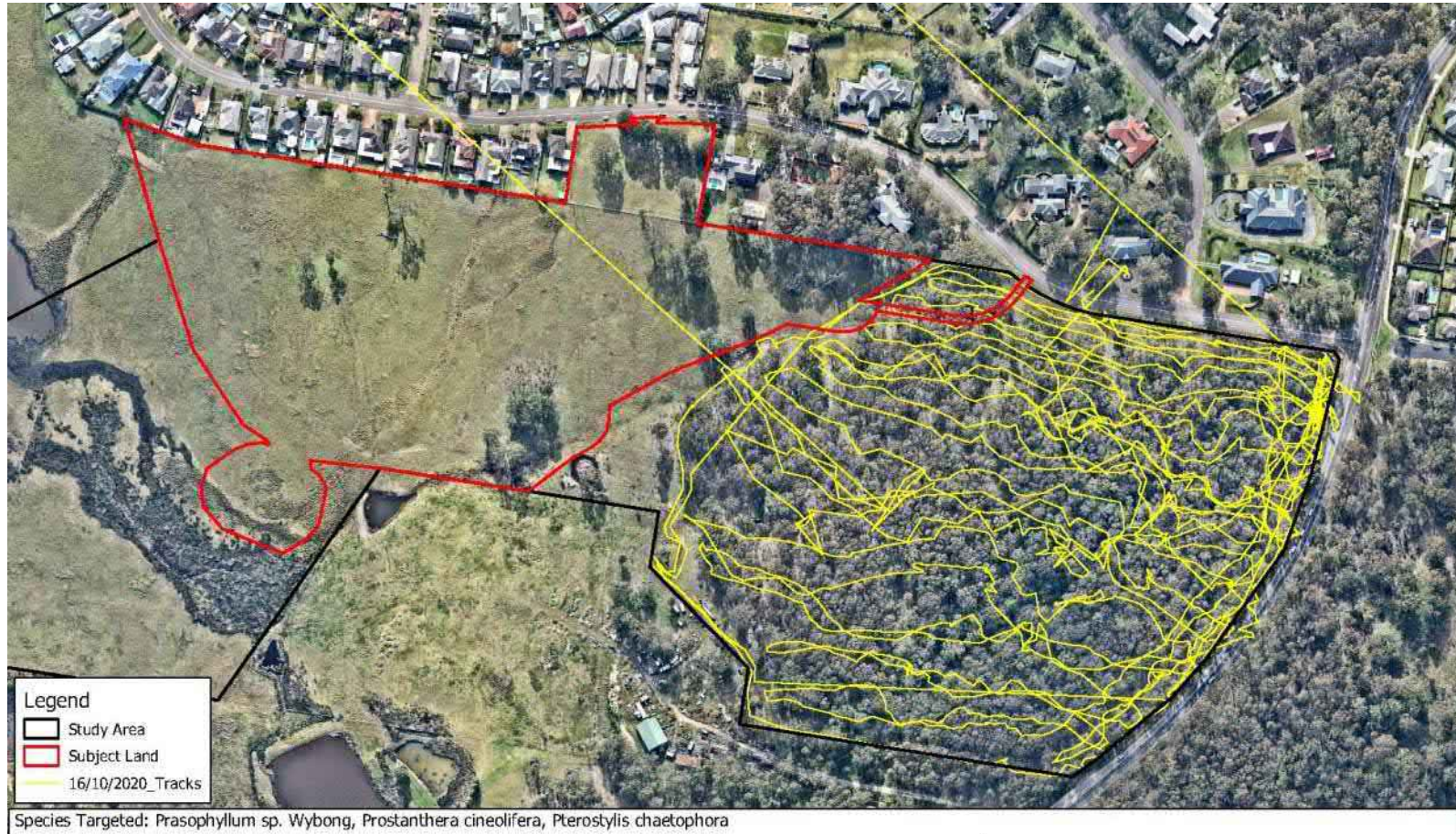
Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW

24 July 2024

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Figure 2.6 Targeted Flora Survey Tracks (October 2021)



Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

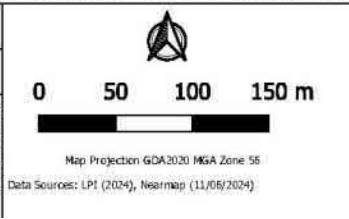


Figure 2.6
**Targeted Flora Searches
 October**

Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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2.4 Threatened fauna survey methods

2.4.1 Review of existing information

Habitat constraints for threatened fauna species are identified in the BAM-C and the Threatened Species Biodiversity Data Collection.

2.4.2 Habitat constraints assessment

Habitat constraints associated with threatened species were assessed for the subject land during field assessments. The habitat constraints included the absence of hollow-bearing trees and other attributes such as a lack of caves and other man-made structures.

2.4.3 Field surveys

The fauna survey was initiated with an assessment of the potential use of the subject land by any species credit species. Subsequently, the confirmation of the fauna species list, by way of on-site observation and recording, was carried out as described below. The survey was carried out using the Department of Environment and Conservation's (NSW) Threatened Biodiversity Survey and Assessment Guidelines – Working Draft (DEC, 2004). Survey details including dates, timing and weather conditions are displayed in Table 2.1.

2.4.3.1 Targeted Amphibian Surveys

Amphibian surveys included a combination of diurnal and nocturnal census methods. Diurnal surveys involved systematic searches within appropriate habitat for basking or sheltering individuals. Any appropriate cover such as logs were turned over for resting individuals. Nocturnal surveys were undertaken in suitable habitat and involved scanning suitable habitat with a torch and listening for the characteristic call of male frogs. Playback of frog calls was undertaken in an attempt to elicit a response from threatened amphibian species. Broadcast calls included *Litoria aurea* (Green and Golden Bell Frog), *Litoria littlejohni* (Littlejohn's Tree Frog) and *Litoria brevipalmata* (Green-thighed Frog). Several additional amphibian surveys have been conducted in the past (Wildthing Environmental Consultants 2016 and 2009). The results from previous surveys have been included within the report. The locations of the amphibian surveys (including historical surveys) are shown in Figure 2.7.

Figure 2.7 Amphibian Survey Tracks



Legend

- Subject Land
- Study Area
- ★ Amphibian Survey (current)
- Amphibian Survey (2016)
- + Amphibian Survey (2009)
- ★ Amphibian Survey with Call Playback (current)
- Amphibian Survey with Call Playback (2016)
- + Amphibian Survey with Call Playback (2009)

Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.




0 50 100 150 m

Map Projection GDA2020 MGA Zone 56
 Data Sources: LPI (2024), Nearmap (11/08/2024)

Figure 2.7
Targeted Amphibian Surveys
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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2.4.3.2 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 high-powered spotlights. Searches targeted both terrestrial and arboreal habitats. Several additional reptile surveys have been conducted in the past (Wildthing Environmental Consultants 2016 and 2009). The results from previous surveys have been included within the report.

2.4.3.3 Diurnal Avifauna Survey

The diurnal avifauna survey involved point assessments for 30 minutes. Surveys were conducted at peak activity periods (i.e., dawn and dusk). Searches were also conducted within the subject land and in close proximity for large stick nests which may indicate breeding by the candidate species. Incidental observations of avifauna were also made during other surveys. Observations were also made of secondary indications (i.e., distinctive feathers and nests) of avifauna were also recorded. Several additional avifauna surveys have been conducted in the past (Wildthing Environmental Consultants 2016 and 2009). The results from previous surveys have been included within the report.

2.4.3.4 Stagwatching Survey

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 surveyor 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) and owl species such as *Tyto novaehollandiae* (Masked Owl), *Ninox connivens* (Barking Owl) and *Ninox strenua* (Powerful Owl). Several additional stag watching surveys have been conducted in the past (Wildthing Environmental Consultants 2016 and 2009). The results from previous surveys have been included within the report. The location of the watched stag trees (including historical surveys) is shown in Figure 2.8.

2.4.3.5 Nocturnal Avifauna Call Playback Survey

During the nocturnal avifauna surveys, pre-recorded calls of *Ninox connivens* (Barking Owl), *Ninox strenua* (Powerful Owl) and *Tyto novaehollandiae* (Masked Owl) were broadcast through an amplification system designed to project the sound for at least 1km under still night conditions. An initial listening period of 10 minutes was undertaken, followed by 5 minutes of calls (repeated in four different directions). A period of two minutes of quiet listening was then employed after each 5-minute bracket of calls. At the conclusion of the call playback survey, spotlighting was carried out in the vicinity of the call playback site. Several additional call playback surveys have been conducted in the past (Wildthing Environmental Consultants 2016 and 2009). The results from previous surveys have been included within the report. The locations of the call playbacks (including historical surveys) are shown in Figure 2.8.

Figure 2.8 Stagwatch and Call Playback Locations



- Legend**
- Subject Land
 - Study Area
 - ★ Owl Call Playback (current)
 - Owl Call Playback (2016)
 - ★ Stag Watching (current)
 - Stag Watching (2016)

Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

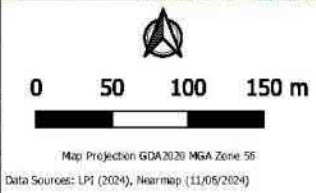


Figure 2.8

Targeted Owl Surveys

Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

2.4.3.6 Spotighting

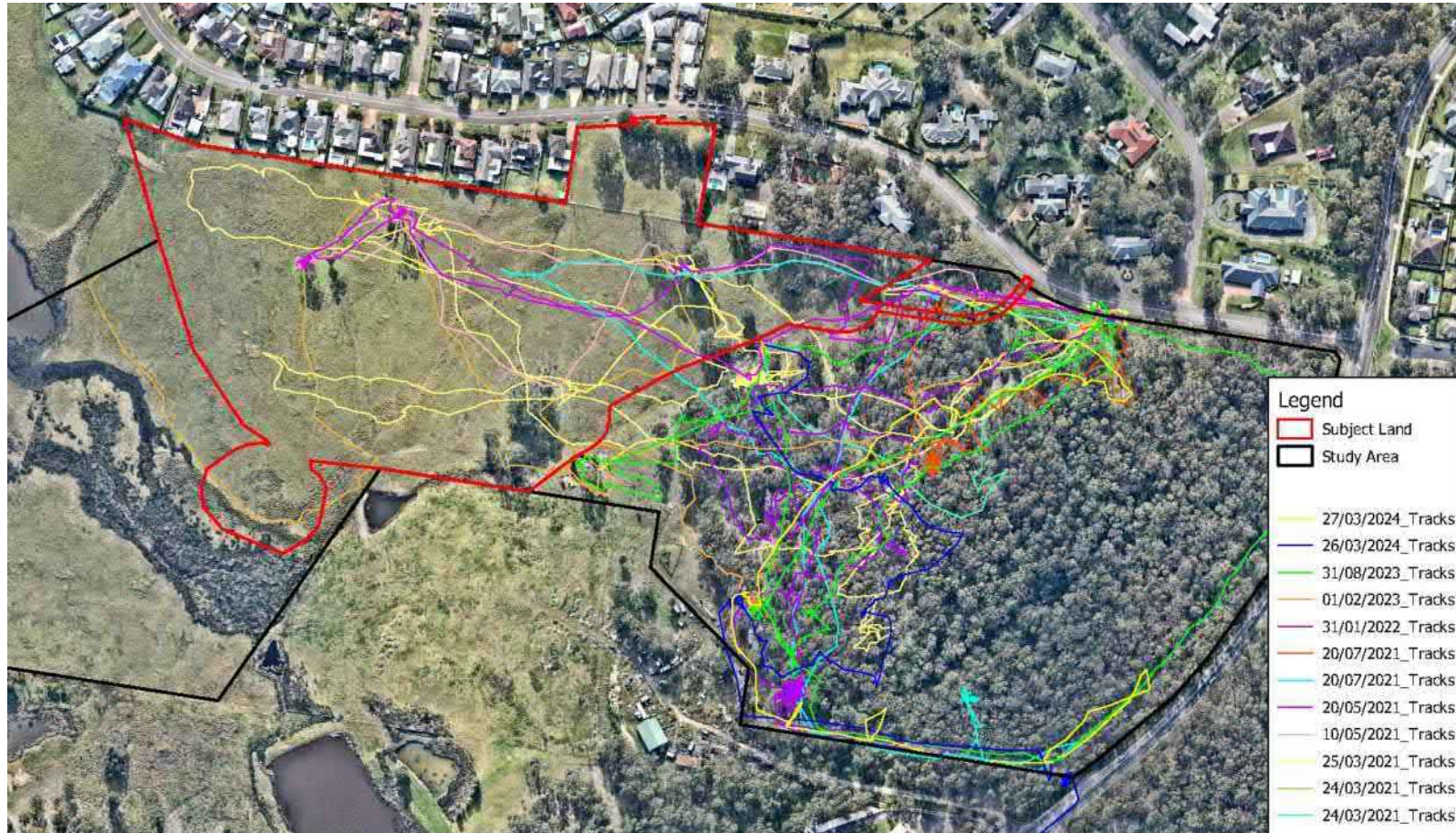
Spotighting was undertaken on foot using 100watt hand-held spotlights and high-powered head torches. The spotighting involved walking at a slow pace along tracks and trails within the subject land area and stopping every 2 minutes, allowing the observer to hear movements of animals in the trees, shrubs and on the ground. Targeted candidate species targeted included *Petaurus norfolcensis* (Squirrel Glider) and *Phascolarctos cinereus* (Koala). Several additional spotighting surveys have been conducted in the past (Wildthing Environmental Consultants 2016 and 2009). The results from previous surveys have been included within the report. The location of the spotighting routes within the subject land is shown in Figure 2.9.

2.4.3.7 Camera Trapping

Four arboreal camera traps (Swift Enduro & Reconyx Hyperfire cameras) were set up within the study area at various times between 22 February 2021 and 27 May 2022. Arboreal cameras were installed at least 4m up in trees to target arboreal species, particularly *Petaurus norfolcensis* (Squirrel Glider). Each of the cameras was aimed at a tree trunk/stem that was smeared with bait containing a mixture of oats, peanut butter and honey. A mixture of honey and water was also sprayed on the trunk of the tree. The location of the camera traps within the subject land is shown in Figure 2.10.

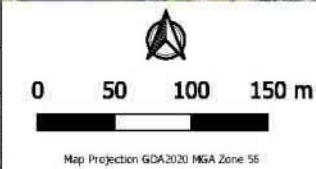
Two ground camera traps (Swift Enduro & Reconyx Hyperfire cameras) were set at a height below 1m, targeting terrestrial mammal species within the subject land at various times between 22 February 2021 and 21 September 2021. One of the cameras was aimed at a bait station containing a mixture of oats, peanut butter, honey and a truffle oil mixture. The location of the camera traps within the subject land is shown in Figure 2.10.

Figure 2.6 Spotlighting Survey Tracks



Job Ref	12503
A4 Scale	1:3,500

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Map Projection GDA2020 MGA Zone 55
 Data Sources: LPI (2024), Nearmap (11/06/2024)

Figure 2.9
Spotlighting Tracks
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

Figure 2.10 Camera Trapping Locations



Legend	
▭	Subject Land
	Study Area
●	Arboreal Camera
●	Ground Camera

Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

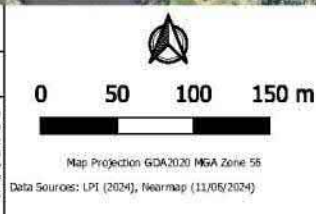


Figure 2.10
Camera Trapping Locations
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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2.4.3.8 *Microchiropteran Bat Call Detection*

Bat call detection surveys were undertaken for the candidate species credit species *Myotis macropus* (Southern Myotis). Bat echo-location calls were recorded using an Anabat Swift and SD1 detector in areas which were considered likely to be used by bats. These positions were selected to sample potential hunting sites for bats, including flyways, clearings and ecotones. Echolocation surveys used stationary surveys. Stationary cameras (Anabat Swift) were left out from dawn to dusk over a period of days. Hand-held surveys were undertaken during spotlighting. . A number of previous bat call surveys have been undertaken within the subject land in 2009 & 2015 (Wildthing Environmental Consultants, 2009 & 2016) and these results have been included within the report.

The bat calls recorded by Wildthing Environmental Consultants were analysed in-house by Mungo Worth. The location of the microchiropteran bat call surveys is shown in Figure 2.11.

2.4.3.9 *Harp Trapping*

Two monofilament harp traps were set over one night within the subject land including the impact area in March 2021. The harp trapping was undertaken in order to sample the use of the site by sub-canopy microchiropteran bat species. Traps were positioned in potential flyways and were checked late evening and early each morning, with any captures being identified. Harp trapping has been previously undertaken within the subject land in 2009 & 2015 (Wildthing Environmental Consultants, 2009 & 2016) and the results have been included within the report. Harp Trap locations (including historical surveys) are shown in Figure 2.11.

2.4.3.10 *Koala Spot Assessment Technique*

The Spot Assessment Technique (SAT): a tool for determining localised levels of habitat use by Koalas was used to obtain additional information on Koala activity within the study area. The SAT involved a radial assessment of “Koala activity” within the immediate area surrounding a tree of any species that is known to have been utilised by the species, or otherwise considered to be of some importance for Koala conservation and/or management purposes. Three assessments were undertaken within random sites of the subject land.

In the field the technique was applied as follows:

1. Locate and uniquely mark with flagging tape a tree (the centre tree) that meets one or more of the following selection criteria:
 - a. a tree of any species beneath which one or more Koala faecal pellets have been observed and/or
 - b. a tree in which a Koala has been observed and/or
 - c. any other tree known or considered to be potentially important for the Koala, or of interest for other assessment purposes.

Figure 2.11 Targeted Bat Survey Locations



Legend

- Subject Land
- Study Area
- Anabat
- ★ Harp Trap (current)
- Harp Trap (2016)
- + Harp Trap (2009)

Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.




0 50 100 150 m

Map Projection GDA2020 MGA Zone 55
 Data Sources: LPI (2024), Nearmap (11/06/2024)

Figure 2.11
Targeted Bat Surveys
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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2. Identify and uniquely mark the 29 nearest trees to the centre tree,

3. Undertake a search for the Koala faecal pellets beneath each of the 30 marked trees based on a cursory inspection of the undisturbed ground surface within a distance of 200 centimetres around the base of each tree, followed (if no faecal pellets are initially detected) by a more thorough inspection involving disturbance of the leaf litter and ground cover within the prescribed search area.

A minimum of two-person minutes per tree was dedicated to the faecal pellet search. The search of an individual tree was concluded once a single faecal pellet has been detected or when the maximum search time has expired, whichever happens first. This process was repeated until each of the 30 trees in the site had been assessed.

2.4.3.11 Incidental Observations and Secondary Indications

All incidental observations and secondary indications such as the presence of scats were recorded.

2.4.3.12 Past Surveys

In 2009 and 2015, small and medium terrestrial mammal trapping as well as arboreal mammal trapping was conducted within the study area (Wildthing Environmental Consultants, 2009 & 2016). The results from these surveys has been included in this report. Survey methodology of the terrestrial and arboreal mammal trapping are described below.

Small Terrestrial Mammal Trapping

Terrestrial mammal trapping was undertaken using 40 Elliott Type A traps (8x10x33cm) within the study area in 2015 and 20 Elliott Type A traps in 2009. The traps were left in place for four consecutive nights giving a total of 240 small terrestrial trap nights. The traps were hidden in thick grass, under shrubs or and around trees and were camouflaged with vegetation where the ground cover was sparse. The baits used for the traps were a mixture of rolled oats, peanut butter and honey, and Good-O's (dry dog food). The traps were checked at first light each morning and, where necessary, reset and rebaited.

Medium Terrestrial Mammal Trapping

Medium terrestrial mammal trapping was undertaken using 10 cage traps (60x35x40cm) within the study area in 2015 and 15 cage traps in 2009. The traps were left in place for four consecutive nights giving a total of 40 terrestrial trap nights. The traps were hidden in thick grass, under shrubs or near fallen logs and were camouflaged with vegetation where the ground cover was sparse. The bait used

for the traps was chicken necks. The traps were checked early each morning and, where necessary, reset and rebaited.

Arboreal Terrestrial Mammal Trapping

Arboreal mammal trapping was undertaken using 20 Elliott Type B traps (15 15 46cm) within the study area in 2015 and 20 Elliott Type B traps in 2009. The traps were left in place for four consecutive nights giving a total of 160 arboreal trap nights. The traps were placed around 3 - 4 metres above the ground on platforms mounted on tree trunks. Trees which were targeted contained hollows, were flowering or had scratches present on the boles. The baits used consisted of a rolled oats, peanut butter and honey mixture, and a two pieces of liquorice. The traps were sprayed with honey mixed in water before being placed in the trees to attract fauna and mask the smell of humans. The tree trunks were also sprayed with this mixture each day. In all cases the traps were checked early each morning and, where necessary, reset and rebaited.

2.5 Weather conditions

Survey effort, dates and timing and conditions are presented in Table 2.1. It should be noted that NSW has experience a high amount of rainfall in the month leading up to surveys undertaken within the subject land. The ground was noted to be wet underfoot, with visible pooling of water in low-lying depressions.

Table 2.1 Environmental conditions during threatened species surveys

Survey undertaken (e.g. method / targeted species)	Date	Time	Survey Effort (Person Hours)	Temperature (min. & max.)	Wind (light, mod...)	Rainfall (mm) at weather station	Other conditions relevant to the species
Koala SAT Surveys	Monday 22/07/2024	1300 – 1615	6.5 (two persons)	17°C	20km/hr WNW		1/8 Cloud, 53% Relative humidity
Tree Survey	Thursday 11/07/2024	1415 – 1615	4.0 (two persons)	16.5°C	6km/hr W		8/8 Cloud, 61% Relative Humidity
BAM Plots	Tuesday 09/07/2024	1300 – 1545	5.5 (two persons)	15.7°C	15km/hr NW	0.6mm since 9am	7/8 Cloud, 97% Relative humidity
Avifauna Survey	Wednesday 27/03/2024	1845 – 1915	0.5 (one person)	24°C	11km/hr SE		0/8 Cloud, 70% Relative humidity
Amphibian Survey Spotlighting		1915 - 2115	2.0 (one person)	23°C	11km/hr SE		0/8 Cloud, 72% Relative humidity
Amphibian Survey Spotlighting	Tuesday 26/03/2024	1900 – 2030	1.5 (one person)	24°C	10km/hr N		0/8 Cloud, 8/8 Moon, 65% Relative humidity
Retrieve Anabat	Thursday 01/02/2024	1045 – 1115	0.5 (one person)	25.2°C	11km/hr SE		8/8 Cloud, 78% Relative humidity
Set Anabat	Thursday 25/01/2024	1230 – 1300	0.5 (one person)	39.4°C	19km/hr W		3/8 Cloud, 26% Relative humidity
Stagwatch/owl call listen Spotlight Amphibian Survey	Thursday 31/08/2023	1745 – 1945	2.0 (one person)	16°C	6km/hr ESE		0/8 Cloud, 8/8 Moon, 81% Relative humidity
Avifauna Survey Retrieve Anabat	Monday 06/02/2023	1100 – 1130	0.5 (one person)	28°C	13km/hr		2/8 Cloud, 58% Relative humidity

Survey undertaken (e.g. method / targeted species)	Date	Time	Survey Effort (Person Hours)	Temperature (min. & max.)	Wind (light, mod...)	Rainfall (mm) at weather station	Other conditions relevant to the species
Avifauna Survey Set Anabat	Wednesday 1/02/2023	1900 – 2000	1.0 (one person)	25.3°C	22km/hr SE		2/8 Cloud, 71% Relative humidity
Amphibian Survey Spotlight		2000 - 2115	1.25 (one person)	25°C			2/8 Cloud, 7/8 Moon, 75% Relative humidity
Onsite Meeting	Monday 28/11/2022	1000 – 1115	1.25 (one person)				
Change Wildlife Camera Location	Tuesday 05/04/2022	0930 – 1000	1.0 (two persons)	22°C	9km/hr W		0/8 Cloud, 70% Relative humidity
Avifauna Survey Stagwatch Spotlight Retrieve Anabat	Monday 31/01/2022	1930 – 2145	4.5 (two persons)	27.5°C	20km/hr ESE		4/8 Cloud, 1/8 Moon, 68% Relative humidity
Set Anabat Habitat Tree Survey	Friday 28/01/2022	0900 – 1200	6.0 (two persons)	25°C	6km/hr ENE		3/8 Cloud, 66% Relative humidity
Habitat Tree Survey	Thursday 27/01/2022	0830-1500	13.0 (two persons)	21°C	13km/hr ESE		1/8 Cloud, 75% Relative humidity
Retrieve Wildlife Cameras	Tuesday 21/09/2021	0645 – 0730	0.75 (one person)	10°C	15km/hr WNW		5/8 Cloud, 64 % Relative humidity
Targeted Flora Survey	Tuesday 10/08/2021	0830 – 1245	12.75 (three persons)	8.5°C	Calm		1/8 Cloud, 100% Relative humidity
Retrieve Song Meter Avifauna Survey	Monday 9/08/2021	1020 – 1050	0.5 (one person)	15°C	9km/hr ENE		4/8 Cloud, 73% Relative humidity
Set Song Meter Avifauna Survey	Friday 06/08/2021	1130 – 1230	1.0 (one person)	°C			0/8 Cloud, % Relative humidity
Stagwatch Owl Call Playback Spotlight	Tuesday 20/07/2021	1715 – 1800	0.75 (one person)	11°C	Calm		0/8 Cloud, 7/8 Moon, 66% Relative humidity

Survey undertaken (e.g. method / targeted species)	Date	Time	Survey Effort (Person Hours)	Temperature (min. & max.)	Wind (light, mod...)	Rainfall (mm) at weather station	Other conditions relevant to the species
Targeted Flora Survey	Monday 07/06/2021	0800 – 1100	9.0 (two persons)	5°C	2km/hr WNW		0/8 Cloud, 95% Relative humidity
Stagwatch Owl Call Playback Spotlight	Thursday 20/05/2021	1700 - 1815	2.5 (two persons)	18°C	Calm		2/8 Cloud, 4/8 Moon, 51% Relative humidity
Stagwatch Owl Call Playback Spotlight	Monday 10/05/2021	1715 - 1830	1.25 (one person)	19°C	Calm		5/8 Cloud, 1/8 Moon, 64% Relative humidity
BAM Plots Tree Survey Spot Assessment Technique	20/04/2021	0830 - 1700	25.5 (Three persons)				
BAM Plots	19/04/2021	1230 - 1630	12.0 (Three persons)				
Targeted Flora Survey	Thursday 01/04/2021	0845 - 0945	2.0 (two persons)	16°C	9km/h W		3/8 Cloud, , 98% Relative humidity
Retrieve Harp Trap	Thursday 25/03/2021	0515 - 630	2.5 (two persons)	20°C	12km/h WNW		2/8 Cloud, 67% Relative humidity
Targeted Flora Surveys Stag Watching Spotlighting Amphibian Survey Anabat Call Recording		1700 - 2045	7.5 (two persons)	27°C	19km/h NW		1/8 Cloud, 48% Relative humidity
Set up Harp Trap	Wednesday 24/03/2021	1600 – 1730	3.0 (two persons)	28°C	24km/h WNW		1/8 Cloud, 47% Relative humidity
Avifauna Survey Set up Anabat call recorder Reptile Survey		1745 – 1915	1.5 (one person)	24°C,	13km/h WNW		0/8 Cloud, Moon 6/8, 54% Relative humidity,

Survey undertaken (e.g. method / targeted species)	Date	Time	Survey Effort (Person Hours)	Temperature (min. & max.)	Wind (light, mod...)	Rainfall (mm) at weather station	Other conditions relevant to the species
Amphibian Survey Spotlighting		1915 - 2015	1.0 (one person)	23°C	5km/h NW		0/8 Cloud, 6/8 Moon, 57% Relative humidity
Retrieve Wildlife Cameras and Anabat call recorder	Friday 26/02/2021	0700 – 0730	0.5 (one person)	20°C	12km/h W		0/8 Cloud, 78% Relative humidity
Avifauna Survey	Tuesday 23/02/2021	1730-1800	0.50 (one person)	20°C	16km/h SSE		8/8 Cloud,, 74% Relative humidity
Set up Wildlife Cameras Set up Anabat call recorder	Monday 22/02/2021	0915-1015		23°C	11km/h WNW		0/8 Cloud, 87% Relative humidity
Targeted Flora Survey	Friday 22/01/2021	0730-1130	8.0 (two persons)	21°C	7km/h WNW		0/8 Cloud, 76% Relative humidity
Targeted Flora Survey	Friday 16/10/2020	0800-1230	9.0 (two persons)	19°C	9 km/hr SSE		7/8 Cloud, 63% Relative humidity

2.6 Limitations

Limiting factors 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.

2.7 Licences

Fieldwork undertaken by Wildthing Environmental Consultants was carried out under the NPWS Scientific Investigation Licence SL 100345 and under Animal Care and Ethics Approval: Animal Research Authority Issue by the Director General of NSW Agriculture (File No. TRIM 13/251) for the Fauna Survey for Biodiversity and Impact Assessment.

3.0 Site context

3.1 Assessment area

The assessment area included the subject land and all land within a 1500m buffer around the boundary of the subject land for a total area of 977.48ha. The assessment area has been presented in Figure 3.1.

3.2 Landscape features

3.2.1 IBRA bioregions and IBRA subregions

Interim Biogeographic Regionalisation for Australia (IBRA) Bioregions are large, geographically distinct areas of land with common characteristics such as geology, landform patterns, climate, ecological features, and flora and fauna communities. The subject land is located within the Sydney Basin (SYB) IBRA Bioregion and the Hunter IBRA Subregion (DAWE 2016). Both IBRA and IBRA Subregional Boundaries do not occur near the subject land and hence are not shown within any Figures.

3.2.2 Rivers, streams, estuaries and wetlands

The subject land is located within the Hunter Local Land Services Region and the Hunter River catchment. According to the SEPP (Resilience and Hazards) 2021 Ch. 2 Coastal Management SEPP the Coastal Management Area and Coastal use area are located outside of the subject land to the north (Figure 3.1). These areas are mapped within the Assessment Area (Figure 3.1). There is one mapped first order stream within the subject site, which turns into a second order stream off site. The stream flows south-westwards, where it enters a freshwater wetland. There are no listed Designated Important Wetland of Australia (DIWA) nationally important Wetlands within the 1500m buffer

3.2.3 Habitat connectivity

The eastern portion of the site where the dry sclerophyll forest is located has been mapped as Key Fauna Habitat (DPIE, 2021) (Figure 3.2). This area of Key Fauna Habitat is largely located to the east of the proposed rezoning area. A small area of the rezoning area occurring in the north will be impacted. Habitat within the subject lands is connected to more extensive remnant vegetation to the east and south, however is fragmented by Mount Vincent Road, Maitland Waste Station, NSW Rural Fire Service Lower Hunter station, and scattered residential & rural development, cleared agricultural and other lands. The majority of the rezoning area (development site) has been historically extensively cleared and subject to agricultural activities which contains retaining paddock trees and some small patches of native vegetation.

3.2.4 Karst, caves, crevices, cliffs, rocks or other geological features of significance

No significant geological features were present within the subject land.

3.2.5 Areas of outstanding biodiversity value

No areas of outstanding biodiversity value were identified within the subject land or assessment area.

Figure 3.1 Assessment area showing Prescribed Streams and Water Bodies

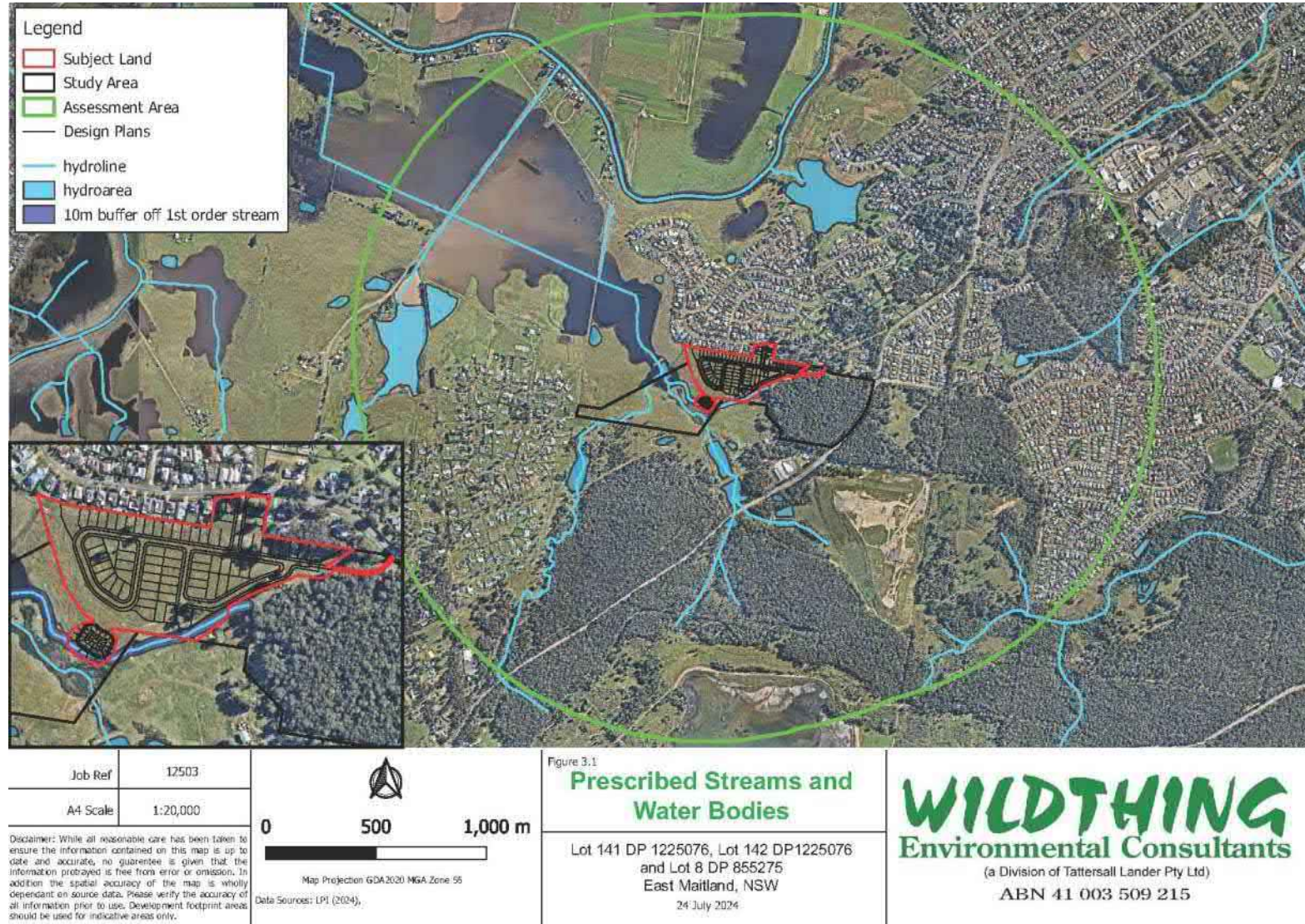
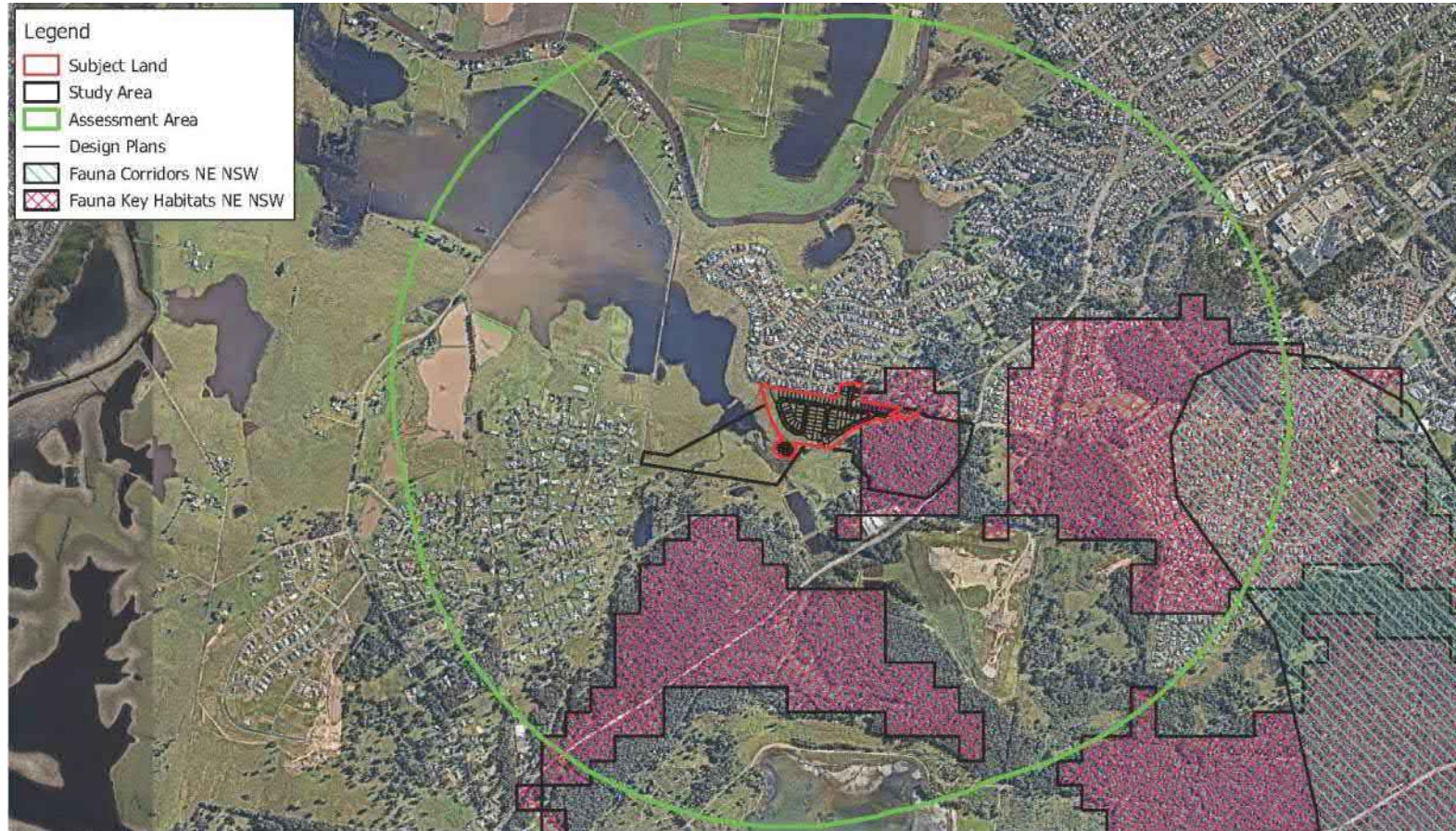
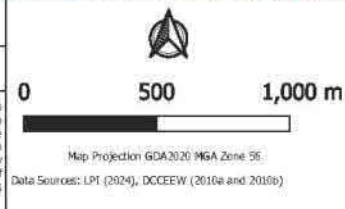


Figure 3.2 Fauna corridors and key habitat



Job Ref	12503
A4 Scale	1:20,000



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Figure 3.2
Fauna Corridors and Key Habitat
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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3.2.6 BioNet Landscapes NSW

The subject land fell within the BioNet Landscapes (formerly Mitchell Landscapes) (DPIE 2017) Newcastle Coastal Ramp and Lower Hunter Channels and Floodplains. . The vast majority of the subject land including the impact area was located within the Newcastle Coastal Ramp Landscape. A small area of Lower Hunter Channels & Floodplains was present on the western boundary of the subject land. BioNet Landscapes occurs within subject land and assessment area are shown in Figure 3.3.

3.2.7 Geology and Soils

The underlying geology consists of the Beresfield soil landscape, consisting of moderately deep Yellow & Brown Podzolics, and Soloths (Figure 3.4). It occurs over Permian sediments in the east Maitland hills region. High water erosion hazard and highly acid soils of low fertility. Soils over the low-lying areas off the site to the south consist of Hunter Soil Landscape, being alluvial soils, with high water tables and are mapped as flood prone land over the wetland area only off the site. No parts of the development site are mapped as Acid Sulphate Soil occurrence.

3.2.8 Important Areas Map

The Important Areas Map was consulted and no areas of important habitat are mapped within or in proximity to the study area.

3.3 Native vegetation cover

Native vegetation cover in the assessment area mainly comprised of remnant dry sclerophyll forest. The majority of the remnant forest to the north of the subject land was located in an urban setting. Areas of native grassland were present and native vegetation associated with water bodies and ephemeral creeks was located in the west and south of the assessment area.

Approximately 303.78ha of native vegetation was mapped within the 958.40ha assessment area (subject land and within a 1500m buffer and surrounding the outer edge surrounding the boundary of the subject land). Native vegetation cover within the assessment area is approximately 31.70% (32%) and falls within the >30-70% class according to the BAM (2021e). Table 3.1 summarises the extent of native vegetation cover within the assessment area. Figure 3.5 shows native vegetation cover within the assessment area.

Table 3.1 Native vegetation cover in the assessment area

Assessment area (ha)	958.40
Total area of native vegetation cover (ha)	303.78
Percentage of native vegetation cover (%)	31.70
Class (0-10, >10-30, >30-70 or >70%)	>30-70%

Figure 3.3 Occurrences of BioNet (Mitchell) Landscapes within and in proximity to the subject land



Legend

- Subject Land
- Study Area
- Design Plans

NSW (Mitchell) Landscapes v31

- Lower Hunter Channels and Floodplains
- Newcastle Coastal Ramp

Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

0 50 100 150 m

Map Projection: GDA2020 MGA Zone 55

Data Sources: LPI (2024), Nearmap (11/05/2024), DCCEEW (2015)

Figure 3.3

BioNet Landscapes

Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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Figure 3.4 Occurrence of Soil Landscapes within and in proximity to the subject land



Job Ref	12503
A4 Scale	1:3,500

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 portrayed 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.

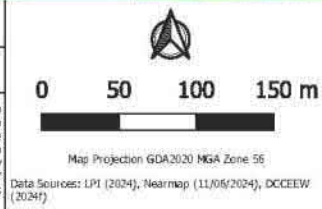


Figure 3.4

Soil Landscapes

Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW

24 July 2024

Figure 3.5 Native Vegetation within the Assessment Area.



Job Ref	12503	  Map Projection GDA2020 MGA Zone 56 Data Sources: LPI (2024)	Figure 3.5	<p>Native Vegetation</p> <p>Lot 141 DP 1225076, Lot 142 DP1225076 and Lot 8 DP 855275 East Maitland, NSW 24 July 2024</p>	<p>WILDTHING Environmental Consultants</p> <p>(a Division of Tattersall Lander Pty Ltd) ABN 41 003 509 215</p>
A4 Scale	1:20,000		<p>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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.</p>		

3.4 Past and current disturbance to native vegetation

The vegetation within the east of the study area had been subject to disturbances from past vegetation clearance, cattle grazing, historical coal mining activity and weed invasion particularly in the form of *Lantana camara* (Lantana) and introduced grasses. Native vegetation in the form of open forest/woodland covered the majority of the eastern portion of the subject land. The lower western portion of the subject land had undergone a high level of disturbance and was largely composed of grassland/pasture with some remnant trees and has been subject to ongoing cattle grazing.

4.0 Native vegetation, threatened ecological communities and vegetation integrity

4.1 Native vegetation extent

Approximately 303.78ha of native vegetation was mapped within the 958.40ha assessment area (Native vegetation cover within the assessment area is approximately 31.70% (32%) and falls within Class c. >30-70% according to the BAM (2021e). Figure 3.4 shows the native vegetation extant within the assessment area.

4.1.1 Changes to the mapped native vegetation extent

Native vegetation within the subject land was found to reflect the review of aerial mapping interpretation and did not appear to be recently altered, with the exception of general property maintenance.

4.1.2 Areas that are not native vegetation

Within Lot 8 DP 855275, areas of non-native vegetation were present wherever remnant and planted native trees were not present. Ground cover was dominated by *Pennisetum clandestinum* (Kikuyu) with low amounts of *Cynodon dactylon* (Common Couch) also present (Plate 4.1). Similar low, maintained non-native vegetation was present within the two sections of road reserve along Wilton Drive where access is proposed to the development (Plate 4.2).

Within Lot 141 DP 1225076, areas of non-native vegetation were present wherever remnant and planted native trees were not present in the western half of the lot. Vegetation within the drainage line running up the eastern edge of the subject land was also non-native. These areas were principally composed of introduced species *Axonopus fissifolius* (Narrow-leaved Carpet Grass), *Paspalum dilatatum* (Paspalum), *Senecio madagascariensis* (Fireweed), *Plantago lanceolata* (Plantain). Native species *Cynodon dactylon* (Couch) and *Bothriochloa macra* (Red Leg Grass) were present in low frequencies. Non-native vegetation within Lot 141 DP 1225076 has been shown in Plates 4.3 – 4.5. The total area of non-native vegetation that was present within the subject land was 5.23ha.

A constructed dam just outside the south-east corner of the subject land contained native species *Typha orientalis* (Cumbungi) in its centre but otherwise lacked native vegetation around its edge. Introduced grassed and groundcovers dominated the edge of the dam except for a few scattered *Juncus usitatus* (Common Rush). Aquatic vegetation was present around the constructed dam in the south-east corner of the subject land. The dominant component of the vegetation on the edge of the dam was non-native.

The location of non-native vegetation, constructed dams and drainage lines within the subject land has been shown in Figure 4.1.



Plate 4.1: Non-native vegetation within Lot 8 DP 855275 (facing south-east).



Plate 4.2: Non-native vegetation within road reserve of Lot 8 DP 855275.



Plate 4.3: Non-native vegetation in south-west of the subject land (facing south).



Plate 4.4: Non-native vegetation in south-west of the subject land (facing north).



Plate 4.5: Non-native vegetation within drainage line along east of subject land.

Figure 4.1 Areas of non-native vegetation within subject land



Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

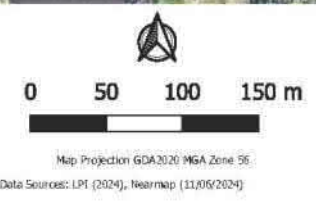


Figure 4.1
Areas of Non-Native Vegetation
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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4.2 Plant Community Types

4.2.1 Overview

Vegetation within the subject land has been assessed as aligning with the BioNet Vegetation Classification Plant Community Types (PCTs) identified within Table 4.1, 4.2, 4.3 and 4.4 and their extent is shown in Figure 4.2. Previously identified PCTs were compared to new PCTS, existing mapping and for some PCTs BioNet Vegetation Classification bulk export data of all PCT's was downloaded and filtered. Filters (search terms) were applied to determine the most consistent PCT. Flora species within each stratum within the vegetation assemblage Detailed descriptions of the determination of each PCT are provided in the following subsections.

Table 4.1 PCTs identified within the subject land

PCT ID	PCT name	Subject land area (ha)
3444	Lower Hunter Spotted Gum-Ironbark Forest	2.78
3328	Lower Hunter Red Gum-Paperbark Riverflat Forest	0.48
3975	Southern Lower Floodplain Freshwater Wetland	0.19
3446	Lower North Foothills Ironbark-Box-Gum Grassy Forest	0.50
Total area		3.95

4.2.1.1 PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest

Table 4.2 PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest

PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest	
PCT No.	3444
PCT Name	Lower Hunter Spotted Gum-Ironbark Forest
Previous PCT	1600 Spotted Gum - Red Ironbark - Narrow-leaved Ironbark -Grey Box shrub-grass open forest of the lower Hunter (Wildthing Environmental Consultants 2021)
Vegetation Formation	Dry Sclerophyll Forests (shrub/ grass sub formation)
Vegetation Class	Hunter –Macleay Dry Sclerophyll Forests
Extent to be removed	2.78ha
Justification of PCT	<p>This area of vegetation was previously identified as PCT 1600 Spotted Gum - Red Ironbark - Narrow-leaved Ironbark -Grey Box shrub-grass open forest of the lower Hunter (Wildthing Environmental Consultants 2021).</p> <p>Review of the lineage history of PCT 1600 in the BioNet Vegetation Classification (DPE 2024) revealed that the PCT was split into three new PCTS: 3433 Hunter Coast Foothills Spotted Gum-Ironbark Grassy Forest 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest and 3444 Lower Hunter Spotted Gum-Ironbark Forest.</p> <p>PCT 3433 is characterised by having higher frequency of mahogany eucalypts and melaleucas. No mahoganies or melaleucas were present therefore this PCT was not considered further.</p>

PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest	
	<p>PCT 3446 contains similar species as PCT 3444 however <i>E. tereticornis</i> (Forest Red Gum) is present in higher frequencies than ironbarks. Vegetation within the study area was dominated by <i>Corymbia maculata</i> (Spotted Gum) and ironbark's.</p> <p>PCT 3444 contains similar species to PCT 3446 however ironbark's are present in higher frequencies and <i>E. tereticornis</i> is less frequent. This is most consistent with what was observed in the study area. Further, this PCT is mapped within the study area on the State Vegetation Type Map (SVTM) (OEH, 2024).</p> <p>PCT 3444 was therefore selected based on its association to previously identified PCT, its similar composition to the vegetation on site and vegetation mapping.</p>
Description of PCT within the subject land.	<p>Canopy species included <i>Corymbia maculata</i> (Spotted Gum), <i>Eucalyptus siderophloia</i> (Northern Grey Ironbark), <i>Eucalyptus fibrosa</i> (Broad-leaved Ironbark) and <i>Eucalyptus crebra</i> (Narrow-leaved Ironbark). Other canopy species noted included <i>Eucalyptus punctata</i> (Grey Gum), <i>Eucalyptus tereticornis</i> (Forest Red Gum) and <i>Eucalyptus globoidea</i> (White Stringybark). The mid storey primarily consisted of juvenile canopy species particularly <i>C. maculata</i>. <i>Bursaria spinulosa</i> (Blackthorn) and <i>Daviesia ulicifolia</i> were the most common component of the shrub layer. Other native shrub species noted included <i>Breynia oblongifolia</i> (Breynia) and <i>Leucopogon juniperinus</i> (Bearded Heath). The ground cover was composed of native grasses such as <i>Entolasia stricta</i>, <i>Microlaena stipoides</i> (Weeping Grass), <i>Aristida vagans</i> (Three-awn Speargrass) and <i>Themeda australis</i> (Kangaroo Grass). Other groundcovers included <i>Lobelia purpurascens</i> (White Root), <i>Goodenia rotundifolia</i> and <i>Cheilanthes sieberi</i> (Mulga Fern).</p> <p>Introduced flora species were common and included <i>Lantana camara</i> (Lantana), <i>Bidens pilosa</i> (Cobbers Tack), <i>Cirsium vulgare</i> (Black Thistle), <i>Sida rhombifolia</i> (Paddy's Lucerne), <i>Cenchrus clandestinus</i> (Kikuyu) and <i>Olea europaea</i> subsp. <i>cuspidata</i> (African Olive).</p>
Condition States	<p>Based on past disturbances (Coal Mining, past vegetation clearance, weed infestation and ongoing grazing by cattle) PCT 3444 was found to be present in a range of conditions within the subject land.</p> <p>The area of PCT 3444 within the eastern portion of the subject land was found to be in relatively good condition. PCT 3444 occurring within the impact area was subject to substantial disturbance and was represented by isolated occurrences of mature remnant trees or derived grassland largely void of trees.</p>
TEC Status BC Act	Consistent with the EEC Lower Hunter Spotted Gum Ironbark Forest Endangered Ecological Community
TEC Status EPBC Act	Not consistent with any nationally listed TEC.
A Photo examples of PCT 3444 within the subject land is shown in Plate 4.7 - 4.10.	

PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest



Plate 4.7: PCT 3444 within the eastern portion of the subject land outside impact area.



Plate 4.8: PCT 3444 within the eastern portion of the subject land outside of the impact area.

PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest



Plate 4.9: PCT 3444 northern area of the subject land.



Plate 4.10: PCT 3444 within the impact area.

4.2.1.2 PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest

Table 4.3 PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest

Forest Red Gum grassy open forest on floodplains of the lower Hunter	
PCT No.	3328
PCT Name	Lower Hunter Red Gum-Paperbark Riverflat Forest
Previous PCT	1598 Forest Red Gum grassy open forest on floodplains of the lower Hunter (Wildthing Environmental Consultants 2021).
Vegetation Formation	Grassy Woodlands
Vegetation Class	Coastal Valley Grassy Woodlands
Extent to be removed	0.48ha
Justification of PCT	<p>This area of vegetation was previously identified as PCT 1598 Forest Red Gum grassy open forest on floodplains of the lower Hunter (Wildthing Environmental Consultants 2021).</p> <p>Review of the lineage history of PCT 1598 in the BioNet Vegetation Classification (DPE 2024) revealed that the PCT was amalgamated to PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest.</p> <p>PCT 3328 is described as having a canopy that very frequently includes a high cover of <i>Eucalyptus amplifolia</i> which is rarely replaced by <i>Eucalyptus tereticornis</i>. Only one canopy species was present; <i>Eucalyptus tereticornis</i> (Forest Red Gum).</p>
Description of PCT within the subject area.	<p>PCT 3328 occurring within the study area had undergone a disturbance from past vegetation removal, past agricultural impacts, weed incursion and livestock grazing. The only canopy species present on site in this vegetation community was <i>Eucalyptus tereticornis</i> (Forest Red Gum). The native mid and shrub layer was absent and only represented by younger specimens of <i>E. tereticornis</i>. Common native ground covers were <i>Microlaena stipoides</i> (Weeping Meadow Grass) and <i>Lobelia purpurascens</i> (White Root).</p> <p>Introduced flora species were common and included <i>Lantana camara</i> (Lantana), <i>Bidens pilosa</i> (Cobbers Tack), <i>Sida rhombifolia</i> (Paddy's Lucerne), <i>Cenchrus clandestinus</i> (Kikuyu), <i>Olea europaea</i> subsp. <i>cuspidata</i> (African Olive), <i>Solanum nigrin</i> (Blackberry Nightshade) and <i>Tagetes minuta</i> (Stinking Roger).</p>
Condition States	Vegetation immediately surrounding remnant trees contained higher levels of native ground cover species whereas vegetation further away from the remnant trees lacked canopy cover but contained regenerating <i>E. tereticornis</i> .
TEC Status BC Act	Consistent with the EEC Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions.
TEC Status EPBC Act	Not consistent with any nationally listed TEC.
Photo examples of PCT 3328 within the subject land is shown in Plate 4.11 & 4.13.	

Forest Red Gum grassy open forest on floodplains of the lower Hunter



Plate 4.11: PCT 3328 within the subject land.



Plate 4.12: PCT 3328 within the impact area.

Forest Red Gum grassy open forest on floodplains of the lower Hunter



Plate 4.13: PCT 1598 within the subject land.

4.2.1.3 PCT 3975 Southern Lower Floodplain Freshwater Wetland

Table 4.4 PCT 3975 Southern Lower Floodplain Freshwater Wetland

PCT 3975 Southern Lower Floodplain Freshwater Wetland	
PCT No.	3975
PCT Name	Southern Lower Floodplain Freshwater Wetland
Vegetation Formation	Freshwater Wetlands
Vegetation Class	Coastal Freshwater Lagoons
Extent to be removed	0.19ha
Justification of PCT	<p>Review of State Vegetation Type Map (SVTM) (OEH 2024) showed PCT 3975 mapped over other patches of native vegetation along the creek/floodplain connected to this area of the subject land (less than 200m south east of study area). While the vegetation on site was highly disturbed and lacked tree and shrub species. Ground covers present on site were consisted with species associated with PCT 3975.</p> <p>No other floodplain/wetland PCT is mapped nearby or near to the connected floodplain. PCT 3975 was therefore selected.</p>
Description of PCT within the subject land.	<p>This PCT was highly modified by activities such as historical vegetation clearance, historical coal mining activity, grazing and trampling by cattle, recent flooding, sedimentation and weed infestation. Previously the area was found to be affected by relatively high salinity (Salinity 4.2ppt indicating a brackish environment), which was evidenced by a thin white salt crust in low dry areas (Plate 4.14) (Wildthing Environmental Consultants 2016).</p>

PCT 3975 Southern Lower Floodplain Freshwater Wetland

	<p>Species recorded included native species <i>Cynodon dactylon</i> (Couch), <i>Juncus usitatus</i> and <i>Carex longebrachiata</i>.</p> <p>Introduced species consisted of <i>Juncus acutus</i> subsp. <i>acutus</i> (Tall Spike Rush), <i>Senecio madagascariensis</i> (Fireweed), <i>Cirsium vulgare</i> (Black Thistle), <i>Rubus fruticosus</i> sp. agg. (Blackberry), <i>Rumex crispus</i> (Curl Doc), <i>Plantago lanceolata</i> (Plantain) and <i>Trifolium repens</i> (White clover)</p>
Condition States	PCT 3975 was only present in one highly disturbed condition state.
TEC Status BC Act	Consistent with the EEC Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
TEC Status EPBC Act	Not consistent with any nationally listed TEC.

A Photo examples of PCT 3975 within the subject land is shown in Plate 4.14 & 4.16.



Plate 4.14: Thin white salt crust in low dry areas of PCT 3975 from 2015 (Wildthing Environmental Consultants 2016).

PCT 3975 Southern Lower Floodplain Freshwater Wetland



Plate 4.15: PCT 3975 within the far south of the subject land (July 2024)



Plate 4.16: PCT 3975 within far south of the subject land (July 2024).

4.2.1.4 PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest

Table 4.5 PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest

PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest									
PCT No.	3446								
PCT Name	Lower North Foothills Ironbark-Box-Gum Grassy Forest								
Vegetation Formation	Dry Sclerophyll Forests (Shrub/grass sub-formation)								
Vegetation Class	Hunter-Macleay Dry Sclerophyll Forests								
Extent to be removed	0.50ha								
Justification of PCT	<p>Vegetation was dominated by native species <i>Carex longebrachiata</i> which is not associated with any PCTs already identified within the subject land. This vegetation did not contain canopy or mid-canopy species.</p> <p>Potential PCTs were identified by reviewing nearby vegetation mapping and filtering through the BioNet Vegetation Classification Bulk Export Data of all PCTs (DPE 2024c). The following filters were applied:</p> <table border="1"> <thead> <tr> <th>Filter</th> <th>Selection</th> </tr> </thead> <tbody> <tr> <td>IBRA Region</td> <td>Sydney Basin</td> </tr> <tr> <td>IBRA Subregion</td> <td>Hunter</td> </tr> <tr> <td>Grass & Grass-like Growth Form Group Species</td> <td><i>Carex longebrachiata</i></td> </tr> </tbody> </table> <p>The following PCTs remained: 3074, 3076, 3086, 3087, 3100, 3110, 3114, 3171, 3234, 3236, 3241, 3242, 3282, 3354, 3433, 3436, 3446, 3634, 3998, 4006, 4020, 4023, 4039, 4042, 4044, 4056 and 4073.</p> <p>State Vegetation Type Map (SVTM) (OEH 2024) was then reviewed and the closest mapped PCT that contained <i>Carex longebrachiata</i> was PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest. This PCT is mapped as occurring approximately 250m south of the subject land, on the other side of the prescribed streams and floodplain. Due to its proximity to the site and being the closest PCT that is associated with <i>Carex longebrachiata</i>, this PCT was selected for this area of vegetation.</p>	Filter	Selection	IBRA Region	Sydney Basin	IBRA Subregion	Hunter	Grass & Grass-like Growth Form Group Species	<i>Carex longebrachiata</i>
Filter	Selection								
IBRA Region	Sydney Basin								
IBRA Subregion	Hunter								
Grass & Grass-like Growth Form Group Species	<i>Carex longebrachiata</i>								
Description of PCT within the subject land.	<p>This PCT was highly modified by activities such as historical vegetation clearance, historical coal mining activity, grazing and trampling by cattle, recent flooding, sedimentation and weed infestation.</p> <p>The dominant species present was native species <i>Carex longebrachiata</i>. Other native species present in lower frequencies included <i>Cynodon dactylon</i> (Couch), <i>Juncus usitatus</i>, <i>Ranunculus lappaceus</i> (Common Buttercup), <i>Centella asiatica</i> (Indian Pennywort), <i>Geranium solanderi</i> (Native Geranium) and <i>Lobelia purpurascens</i> (Whiteroot).</p> <p>Introduced species consisted of <i>Senecio madagascariensis</i> (Fireweed), <i>Cirsium vulgare</i> (Black Thistle), <i>Rumex crispus</i> (Curled Doc), <i>Plantago lanceolata</i> (Plantain), <i>Conyza bonariensis</i> (Fleabane), <i>Verbena bonariensis</i> (Purple Top) and <i>Trifolium repens</i> (White clover), <i>Taraxacum officinale</i> (Dandelion), <i>Paspalum dilatatum</i> (Paspalum) and <i>Axonopus fissifolius</i> (Narrow-leafed Carpet Grass).</p>								
Condition States	PCT 3446 was only present in one highly disturbed condition state.								
TEC Status BC Act	Not consistent with any nationally listed TEC								
TEC Status EPBC Act	Not consistent with any nationally listed TEC.								
A Photo examples of PCT 3446 within the subject land is shown in Plate 4.17 & 4.18.									

PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest



Plate 4.17: PCT 3446 within the south of the subject land (facing north-east) (July 2024).



Plate 4.18: PCT 3446 within subject land facing west.

Figure 4.2 PCT's within the subject land



Job Ref	12503
A4 Scale	1:3,500

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 portrayed 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.

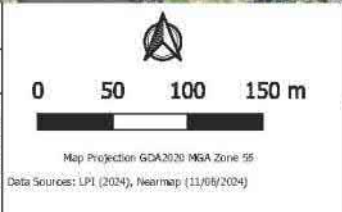


Figure 4.2
PCTs within Subject Land
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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4.3 Threatened ecological communities

Threatened Ecological Communities (TEC's) identified within the subject land are listed in Table 4.6 and their extent is shown on Figure 4.3 Threatened ecological communities and ECs.

Table 4.6 TECs & EC's within the subject land

TEC name	Profile ID (from TBDC)	BC Act status	EPBC Act status	Associated vegetation zones within the subject land	Area within subject land (ha)
Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	10942	Endangered		PCT 3444	2.78ha
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	10416	Endangered		PCT 3328	0.48ha
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	10929	Endangered		PCT 3975	0.19ha

4.4 Vegetation zones

Designation of vegetation zones was undertaken accordance with the methodology for vegetation integrity assessment outlined within Section 4.3 of the BAM (DPIE, 2020a). As described above four PCT's were identified within the subject land:

- PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest
- PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest
- PCT 3975 Southern Lower Floodplain Freshwater Wetland
- PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest

These PCT's were assessed to determine if each PCT could be further stratified into separate vegetation zones based on current condition state or other environmental variables. The random meander, overview inspection and detailed floristic plot data have been used to inform the stratification of this PCT into vegetation zones. It was determined that the condition of PCT 3975 Southern Lower Floodplain Freshwater Wetland and PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest was found to occur within the subject land could not be further stratified into separate vegetation zones. PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest and PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest could each be stratified into two vegetation zones based on condition. Both PCTs were present in two forms; one form contained a shrub layer and mature canopy species while the other was a derived grassland form of the PCT that lacked shrub species and canopy species.

Figure 4.3 Endangered and Threatened Ecological Communities within the subject land



Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

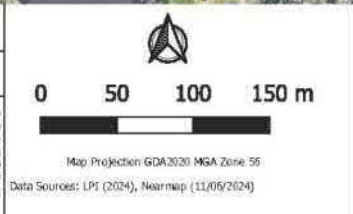


Figure 4.3
EECs within Subject Land
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

(a Division of Tattersall Lander Pty Ltd)
 ABN 41 003 509 215

The resulting vegetation zones were attributed with a vegetation zone ID, which are:

- PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest_Moderate
- PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest_Derived Grassland
- PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest_Moderate
- PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest_Derived Grassland
- PCT 3975 Southern Lower Floodplain Freshwater Wetland
- PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest_Carex Dominant

Descriptions of each vegetation zone are as follows:

PCT 3444_Moderate

Fully structured example of PCT 3444 with native canopy, midstory and groundcover. Dominant canopy species included *Corymbia maculata* and *Eucalyptus siderophloia*. The mid storey primarily consisted of juvenile canopy species particularly *C. maculata* and sparse shrub layer which included *Breynia oblongifolia* and *Bursaria spinosa*. Introduced species such as *Bidens pilosa* and *Lantana camara* were present. Native groundcover included the grass species *Cymbopogon refractus* and *Microlaena stipoides*.

PCT 3444_Derived Grassland

Mature canopy species absent. Native groundcover included the grass species *Sporobolus crebra*, *Cynodon dactylon* (Couch), *Cymbopogon refractus* and *Aristida vagans*. Common introduced groundcovers were *Paspalum dilatatum* (Paspalum), *Axonopus fissifolius* (Narrow-leaved Carpet Grass), *Plantago lanceolata* (Plantain) and *Senecio madagascariensis* (Fireweed).

PCT 3328_Moderate

Tree cover of Redgum and sparse native mid/under storey. Canopy tree species included *Eucalyptus tereticornis*. Shrub species were dominated by introduced *Bidens pilosa* and *Sida rhombifolia*. Native groundcover included *Microlaena stipoides* (Weeping Meadow Grass) and *Commelina cyanea* (Scurvy Weed).

PCT 3328_Derived Grassland

Mature canopy species absent. Regenerating small canopy species present. The mid storey primarily consisted of young juvenile canopy species *E. tereticornis*. Native groundcover included the grass species *Cymbopogon refractus* and *Microlaena stipoides*.

PCT 3975 Southern Lower Floodplain Freshwater Wetland

Canopy, mid-canopy and shrub species absent. Ground cover included *Cynodon dactylon* (Couch), *Juncus usitatus* and *Carex longebrachiata*.

PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest_Carex longebrachiata Dominant

Canopy and mid-canopy species absent. *Carex longebrachiata* dominated ground cover with low frequencies of *Cynodon dactylon* (Couch), *Juncus usitatus* (Common Rush), *Centella asiatica* (Indian Pennywort), and *Lobelia purpurascens* (Whiteroot).

Vegetation Zones within the subject land are identified within Table 4.6 and their extent is shown in Figure 4.4.

Figure 4.4 Vegetation Zones within the subject land



Job Ref	12503
A4 Scale	1:3,500

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 portrayed 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.

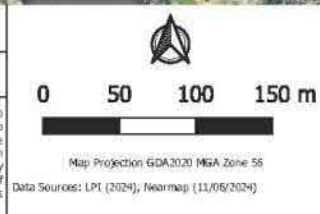


Figure 4.4
Vegetation Zones within Subject Land
 Lot 141 DP 1225076, Lot 142 DP1225076 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

(a Division of Tattersall Lander Pty Ltd)
 ABN 41 003 509 215

Table 4.7 Vegetation zones and patch sizes

Vegetation zone ID	PCT ID number and name	Condition/ other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
1	PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest	Moderate	0.69	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	2	2	2	1A 1B
2	PCT 3444 Lower Hunter Spotted Gum-Ironbark Forest	Derived Grassland	2.09	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	2	2	2	2A 2B
3	PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest	Moderate	0.18	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	1	1	1	3A
4	PCT 3328 Lower Hunter Red Gum-Paperbark Riverflat Forest_Derived Grassland	Derived Grassland	0.30	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	1	1	1	4A
5	PCT 3975 Southern Lower Floodplain Freshwater Wetland	Fair	0.19	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	1	1	1	5A

Vegetation zone ID	PCT ID number and name	Condition/ other defining feature	Area (ha)	Patch size class (select multiple if areas of native vegetation are discontinuous)	No. vegetation integrity plots required	No. vegetation integrity plots completed	No. vegetation integrity plots used in assessment	Plot IDs of vegetation integrity plots used in assessment
	PCT 3446 Lower North Foothills Ironbark-Box-Gum Grassy Forest	Carex Dominant	0.50	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input checked="" type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	1	1	1	6A

4.5 Vegetation integrity (vegetation condition)

4.5.1 Vegetation integrity survey plots

The number of vegetation integrity plots sampled for each vegetation zone was determined by comparing the area of each vegetation zone with Table 3 of the BAM (DPIE 2020a). In all cases at least the minimum number of plots was sampled.

4.5.2 Scores

Table 4.8 Vegetation integrity scores

Vegetation zone ID	Composition condition score	Structure condition score	Function condition score (where relevant)	Vegetation integrity score	Hollow bearing trees present?
PCT 3444_Moderate	52.5	20.8	65.6	41.5	Yes
PCT 3444_Derived Grassland	45.5	6.8	18.5	17.9	No
PCT 3328_Moderate	19	33.3	64.4	34.4	No
PCT 3328_Derived Grassland	26.6	36	15.5	24.6	No
PCT 3975_Fair	30.1	97.3	N/A	54.1	No
PCT 3446_Carex Dominant	12.2	37.1	0.4	5.9	No

4.5.3 Management Zones

All vegetation zones except for PCT 3975_Fair were each split into two management zones based on different impacts that will occur within the subject land. Areas that will require complete removal of all vegetation for the proposed lots, roads or basin were assigned Management Zone 1 (Removal). Areas outside of Management Zone 1 fell within the APZ and were assigned Management Zone 2 (APZ). Future Vegetation Integrity (VI) scored for the management zones were calculated as follows:

Management Zone 1 (Removal)

Future condition and VI scores for this zone were set at 0.

Management Zone 2 (APZ)

Planning for Bush Fire Protection (2019) outlines that Inner Protection Areas should establish and maintain the following criteria:

- *tree canopy cover should be less than 15% at maturity;*
- *tree canopies should be separated by 2 to 5m;*
- *shrubs should not be located under trees;*
- *shrubs should not form more than 10% ground cover*

- *grass should be kept mown (as a guide grass should be kept to no more than 100mm in height); and*
- *leaves and vegetation debris should be removed.*

Based on these recommendations, the following values were chosen for calculating future scores

Item	Value Entered	Justification
Future Composition Data		
Tree	0	Only a couple trees fall within this zone and will likely require removal
Shrub	0	Only a couple trees fall within this zone and will likely require removal
Grass and Grass Like	Same as surveyed	No change. Removal not required for APZ
Forb	Same as surveyed	No change. Removal not required for APZ
Fern	Same as surveyed	No change. Removal not required for APZ
Other	Same as surveyed	No change. Removal not required for APZ
Future Structure Data		
Tree	0	Only a couple trees fall within this zone and will likely require removal
Shrub	0	Most shrubs occur under trees or tree canopy therefore requiring removal to meet APZ requirements
Grass and Grass Like	Same as surveyed	No change. Removal not required for APZ
Forb	Same as surveyed	No change. Removal not required for APZ
Fern	Same as surveyed	No change. Removal not required for APZ
Other	Same as surveyed	No change. Removal not required for APZ
Future Function Data		
Number of Large Trees	0	No trees will be present in this zone
Litter Cover	0	Not allowed within APZ
Length of Fallen Logs	0	Not allowed within APZ
Stem Size Class	0	No trees will be present in this zone
Regeneration	0	Ongoing required mowing will prevent regeneration
High Threat Weed Cover	Same as surveyed	No change. Removal not required for APZ

The management zones across the vegetation zones are shown in Figure 4.5.

Figure 4.5 Management Zones



Job Ref	12503
A4 Scale	1:3,500

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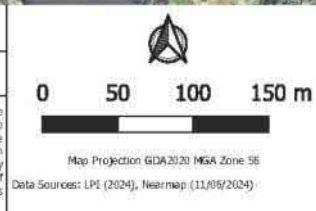


Figure 4.5

Vegetation Management Zones

Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

4.6 Threatened Flora Surveys

One threatened flora species, *Pterostylis chaetophora* (Tall Rustyhood) was recorded within the study area on 16 October 2020. Only a small number of specimens were recorded in the north-east of the study area well outside of the subject land (Wildthing Environmental Consultants, 2021). A photo of *P. chaetophora* within the study area from 2020 is shown below in Plate 4.19.



Plate 4.19: *Pterostylis chaetophora* (Tall Rustyhood) within study area 16 October 2020.

4.7 Tree Survey

Thirteen hollow-bearing trees were found within the subject land during the significant tree survey. No large stick nests were found in trees within the subject land or in close proximity. The location of significant trees within the subject land and within close proximity are shown in are shown in Figure 4.6.

4.8 Movement Corridors

During fieldwork it was observed that a relatively large number of Eastern Grey Kangaroos utilise the eastern portion of the site during the day then traverse the site in the evening to gain access to vegetation within the west of the subject land and neighbouring vegetation. The proposal will impact the ability for mobile species to traverse the subject land to gain access from the eastern portion of the subject land to vegetation to the west. It was also noted that a recent breeding event of Barn Owls had occurred in hollow-bearing trees in the impact zone in the west of the subject land. An aerial photo showing existing movement corridors is shown in Figure 4.7

Figure 4.6 Significant Tree Survey Map



Job Ref	12503
A4 Scale	1:3,500

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 portrayed 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.

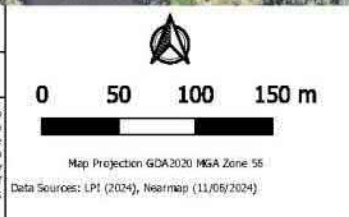


Figure 4.5
Significant Tree Survey Results
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

WILDTHING
 Environmental Consultants
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 ABN 41 003 509 215

Figure 4.7 Existing and future movement corridors



Legend

- Subject Land
- Study Area
- ↔ Existing corridor to be slightly narrowed
- ↔ Existing aquatic corridor to be slightly narrowed

Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependant on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.




0 50 100 150 m

Map Projection GDA2020 MGA Zone 55
 Data Sources: LP1 (2024), Nearmap (11/05/2024)

Figure 4.7
Existing and Future Movement Corridors
 Lot 141 DP 1225076, Lot 142 DP1225076 and Lot 8 DP 855275
 East Maitland, NSW
 23 July 2024

WILDTHING
 Environmental Consultants
 (a Division of Tattersall Lander Pty Ltd)
 ABN 41 003 509 215

5.0 Habitat suitability for threatened species

5.1 Identification of threatened species for assessment

5.1.1 Ecosystem credit species

Table 5.1 Predicted ecosystem credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Magpie Goose	<i>Anseranas semipalmata</i>	V		No	BAM-C	Yes	N/A	PCT 3975	Moderate
Regent Honeyeater (Foraging)	<i>Anthochaera phrygia</i>	CE	CE	Yes	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant	High
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Australasian Bittern	<i>Botaurus poiciloptilus</i>	E	E	No	BAM-C	Yes	N/A	PCT 3975	Moderate
Red Knot (Foraging)	<i>Calidris canutus</i>	V	E	Yes	BAM-C	Yes	N/A	PCT 3975	High
Curlew Sandpiper (Foraging)	<i>Calidris ferruginea</i>	E	CE	Yes	BAM-C	Yes	N/A	PCT 3975	High
Great Knot (Foraging)	<i>Calidris tenuirostris</i>	V	V	Yes	BAM-C	Yes	N/A	PCT 3975	High
Gang-gang Cockatoo (Foraging)	<i>Callocephalon fimbriatum</i>	V	E	Yes	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	V	V	Yes	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
								PCT 3446_Carex dominant	
Greater Sand-plover (Foraging)	<i>Charadrius leschenaultii</i>	V	V	Yes	BAM-C	Yes	N/A	PCT 3975	High
Lesser Sand-plover (Foraging)	<i>Charadrius mongolus</i>	V	E	Yes	BAM-C	Yes	N/A	PCT 3975	High
Speckled Warbler	<i>Chthonicola sagittata</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant	High
Spotted Harrier	<i>Circus assimilis</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant	High
Varied Sittella	<i>Daphoenositta chrysoptera</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant PCT 3975	High
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	E		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
White-fronted Chat	<i>Epthianura albifrons</i>	V		No	BAM-C	Yes	N/A	PCT 3975	Moderate
Black Falcon	<i>Falco subniger</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived	High
Little Lorikeet	<i>Glossopsitta pusilla</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant	High
White-bellied Sea-Eagle (foraging)	<i>Haliaeetus leucogaster</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
								PCT 3975	
Little Eagle (Foraging)	<i>Hieraaetus morphnoides</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate
White-throated Needletail	<i>Hirundapus caudacutus</i>		V	No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	High
Comb-crested Jacana	<i>Irediparra gallinacea</i>	V		No	BAM-C	Yes	N/A	PCT 3975	Moderate
Black Bittern	<i>Ixobrychus flavicollis</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant PCT 3975	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Swift Parrot (Foraging)	<i>Lathamus discolor</i>	E	CE	Yes	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate
Broad-billed Sandpiper (Foraging)	<i>Limosa falcinellus</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant	High
Bar-tailed Godwit (baueri) (Foraging)	<i>Limosa lapponica baueri</i>		V	Yes	BAM-C	Yes	N/A	PCT 3975	High
Black-tailed Godwit (Foraging)	<i>Limosa limosa</i>	V	E	Yes	BAM-C	Yes	N/A	PCT 3975	High
Square-tailed Kite (Foraging)	<i>Lophoictinia isura</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant PCT 3975	High
Little Bent-winged-bat (Foraging)	<i>Miniopterus australis</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant PCT 3975	High
Large Bent-winged-bat (Foraging)	<i>Miniopterus orianae oceanensis</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant PCT 3975	High
Turquoise Parrot	<i>Neophema pulchella</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant PCT 3975	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Blue-billed Duck	<i>Oxyura australis</i>	V		No	BAM-C	Yes	N/A	PCT 3975	Moderate
Eastern Osprey (Foraging)	<i>Pandion cristatus</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate
Yellow-bellied Glider	<i>Petaurus australis</i>	V	V	No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant	High
Scarlet Robin	<i>Petroica boodang</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975	Moderate
Flame Robin	<i>Petroica phoenicea</i>			No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant	Moderate

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant PCT 3975	Moderate
New Holland Mouse	<i>Pseudomys novaehollandiae</i>		V	No	BAM-C	Yes	N/A	PCT 3446_Carex dominant	High
Grey-headed Flying-fox (foraging)	<i>Pteropus poliocephalus</i>	V	V	Yes	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant PCT 3975	High
Rose-crowned Fruit-Dove	<i>Ptilinopus regina</i>	V		No	BAM-C	Yes	N/A	PCT 3446_Carex dominant	Moderate
Australian Painted Snipe	<i>Rostratula australis</i>	E	E	No	BAM-C	Yes	N/A	PCT 3975	Moderate
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3446_Carex dominant	High

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID	Sensitivity to gain class
		BC Act	EPBC Act						
Diamond Firetail	<i>Stagonopleura guttata</i>	V	V	No	BAM-C	Yes	N/A	PCT 3446_Carex dominant	Moderate
Freckled Duck	<i>Stictonetta naevosa</i>	V		No	BAM-C	Yes	N/A	PCT 3975	Moderate
Terek Sandpiper (Foraging)	<i>Xenus cinereus</i>	V	V	Yes	BAM-C	Yes	N/A	PCT 3975	High

5.1.3 Species credit species

Table 5.2 Predicted flora species credit species

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Netted Bottle Brush	<i>Callistemon linearifolius</i>	V		BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Red Helmet Orchid	<i>Corybas dowlingii</i>	E			No	Not east of Morpeth	N/A
Pine Donkey Orchid population in the Muswellbrook local government area	<i>Diuris tricolor - endangered population</i>	E3		BAM-C	No	Outside Muswellbrook LGA	N/A
Singleton Mallee	<i>Eucalyptus castrensis</i>	E		BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Slaty Red Gum	<i>Eucalyptus glaucina</i>	V	V	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
							PCT 3446_Carex dominant PCT 3975
Pokolbin Mallee	<i>Eucalyptus pumila</i>	V	V	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	V	V	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Maundia triglochinooides	<i>Maundia triglochinooides</i>	V		BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Tall Knotweed	<i>Persicaria elatior</i>	V	V	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
North Rothbury Persoonia	<i>Persoonia pauciflora</i>	CE	CE	BAM-C	No	Outside 10km of North Rothbury	N/A
Prasophyllum sp. Wybong	<i>Prasophyllum sp. Wybong</i>		CE	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Singleton Mint-bush	<i>Prostanthera cineolifera</i>	V	V	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975

Common name	Scientific name	Listing status		Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act				
Pterostylis chaetophora	<i>Pterostylis chaetophora</i>	V		BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Scrub Turpentine	<i>Rhodamnia rubescens</i>	CE	CE	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Heath Wrinklewort	<i>Rutidosia heterogama</i>	V	V	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975

Table 5.3 Predicted fauna species credit species

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Regent Honeyeater (Breeding)	<i>Anthochaera phrygia</i>	CE	CE	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A
Bush Stone-curlew	<i>Burhinus grallarius</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Red Knot (Breeding)	<i>Calidris canutus</i>		E	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A
Curlew Sandpiper (Breeding)	<i>Calidris ferruginea</i>	E	CE	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A
Great Knot (Breeding)	<i>Calidris tenuirostris</i>	V	V	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	V	E	Yes	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Glossy Black-Cockatoo (breeding)	<i>Calyptorhynchus lathami</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	V	V	Yes	BAM-C	No	None of the following habitat constraints were within the subject land: <ul style="list-style-type: none"> • Cliffs • Within two kilometres of rocky areas containing caves, overhangs, 	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
							escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels	
Greater Sand-plover (Breeding)	<i>Charadrius leschenaultii</i>	V	V	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A
Lesser Sand-plover (Breeding)	<i>Charadrius mongolus</i>	V	E	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A
Wallum Froglet	<i>Crinia tinnula</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	<i>Dromaius novaehollandiae</i> - endangered population	E3		No	BAM-C	No	Outside of Port Stephens LGA	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Pied Oystercatcher	<i>Haematopus longirostris</i>	E		No	BAM-C	No	None of the following habitat constraints were within the subject land: <ul style="list-style-type: none"> • Within 100m of estuarine areas and the ocean 	N/A
White-bellied Sea-Eagle (breeding)	<i>Haliaeetus leucogaster</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Little Eagle	<i>Hieraaetus morphnoides</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Swift Parrot	<i>Lathamus discolor</i>	E	CE	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A
Broad-billed Sandpiper (Breeding)	<i>Limosa falcinellus</i>		V	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Bar-tailed Godwit (baueri) (Breeding)	<i>Limosa lapponica baueri</i>		V	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A
Black-tailed Godwit (Breeding)	<i>Limosa limosa</i>	V	E	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A
Green & Golden Bell Frog	<i>Litoria aurea</i>	E	V	Yes	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Green-thighed Frog	<i>Litoria brevipalmata</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	V		Yes	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
								PCT 3975
Little Bent-winged Bat (breeding)	<i>Miniopterus australis</i>	V		Yes	BAM-C	No	<p>None of the following habitat constraints were within the subject land:</p> <ul style="list-style-type: none"> • Caves • Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave' • observation type code 'E nest-roost' • with numbers of individuals >500 • or from the scientific literature 	N/A
Large Bent-winged Bat (breeding)	<i>Miniopterus oriana oceanensis</i>	V		No	BAM-C	No	<p>None of the following habitat constraints were within the subject land:</p> <ul style="list-style-type: none"> • Caves • Cave, tunnel, mine, culvert or other structure known or suspected to be used 	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
							for breeding including species records in BioNet with microhabitat code 'IC – in cave' <ul style="list-style-type: none"> • observation type code 'E nest-roost' • with numbers of individuals >500 or from the scientific literature	
Southern Myotis	<i>Myotis macropus</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Barking Owl	<i>Ninox connivens</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Powerful Owl	<i>Ninox strenua</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
								dominant PCT 3975
Eastern Osprey (breeding)	<i>Pandion cristatus</i>	V		Yes	BAM-C	No	None of the following habitat constraints were within the subject land: <ul style="list-style-type: none"> • Presence of stick-nests in living and dead trees (>15m) or artificial structures within 100m of a floodplain for nesting) 	N/A
Southern Greater Glider	<i>Petauroides volans</i>	E	E	No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Squirrel Glider	<i>Petaurus norfolcensis</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	E	V	Yes	BAM-C	No	Presence of stick-nests in living and dead trees (>15m) or artificial structures within 100m of a floodplain for nesting) <ul style="list-style-type: none"> Land within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines 	N/A
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V		No	BAM-C	Yes	N/A	
Koala	<i>Phascolarctos cinereus</i>	E	E	No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Common Planigale	<i>Planigale maculata</i>	V		No	BAM-C	Yes	N/A	
Grey-headed Flying-fox (Breeding)	<i>Pteropus poliocephalus</i>	V	V	Yes	BAM-C	No	None of the following habitat constraints were within the subject land: <ul style="list-style-type: none"> Breeding Camps 	N/A

Common name	Scientific name	Listing status		Dual credit species	Sources	Species retained for further assessment?	Reason for exclusion from further assessment	Vegetation zone ID species retained within, including PCT ID
		BC Act	EPBC Act					
Masked Owl	<i>Tyto novaehollandiae</i>	V		No	BAM-C	Yes	N/A	PCT 3444_Moderate PCT 3444_Derived PCT 3328_Moderate PCT 3328_Low PCT 3446_Carex dominant PCT 3975
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	V		No	BAM-C	No	None of the following habitat constraints were within the subject land: <ul style="list-style-type: none"> • Caves present • Rocky areas within two kilometres containing caves, overhangs, escarpments, outcrops, crevices or boulder piles, or within two kilometres of old mines, tunnels, old buildings or sheds." 	N/A
Terek Sandpiper (Breeding)	<i>Xenus cinereus</i>	V	V	Yes	BAM-C	No	This species was excluded as a SCS as the subject land was not within the Important Areas Map for this species.	N/A

5.2 Presence of candidate species credit species

From the remaining lists shown in Table 5.4 (Flora) and Table 5.5 (Fauna) candidate species credit species can be determined in accordance with BAM Subsection 5.2.4 to be present or absent within the subject land based on:

- assumed presence within the subject land
- an important habitat map (for dual credit species)
- targeted threatened species surveys, or
- an expert report.

The presence or absence of all candidate species credit species was determined by targeted threatened species surveys. No important habitat mapping for any candidate species was present within the subject land.

Table 5.4 Determining the presence of candidate flora species credit species on the subject land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Netted Bottle Brush	<i>Callistemon linearifolius</i>	V		Targeted threatened species survey	No	No
Singleton Mallee	<i>Eucalyptus castrensis</i>			Targeted threatened species survey	No	No
Slaty Red Gum	<i>Eucalyptus glaucina</i>			Targeted threatened species survey	No	No
Pokolbin Mallee	<i>Eucalyptus pumila</i>			Targeted threatened species survey	No	No
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>			Targeted threatened species survey	No	No
Maundia triglochinosides	<i>Maundia triglochinosides</i>			Targeted threatened species survey	No	No
Tall Knotweed	<i>Persicaria elatior</i>			Targeted threatened species survey	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Prasophyllum sp. Wybong	<i>Prasophyllum sp. Wybong</i>	V	V	Targeted threatened species survey	No	No
Singleton Mint-bush	<i>Prostanthera cineolifera</i>	V	V	Targeted threatened species survey	No	No
Pterostylis chaetophora	<i>Pterostylis chaetophora</i>	V	V	Targeted threatened species survey	Yes	Yes
Scrub Turpentine	<i>Rhodamnia rubescens</i>		CE	Targeted threatened species survey	No	No
Heath Wrinklewort	<i>Rutidosis heterogama</i>	V	v	Targeted threatened species survey	No	No

Table 5.5 Determining the presence of candidate fauna species credit species on the subject land

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Bush Stone-curlew	<i>Burhinus grallarius</i>	V		Targeted threatened species survey	No	No
Red Knot (Breeding)	<i>Calidris canutus</i>		E	Targeted threatened species survey	No	No
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	V	E	Targeted threatened species survey	No	No
Glossy Black-Cockatoo (breeding)	<i>Calyptorhynchus lathami</i>	V		Targeted threatened species survey	No	No
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V		Targeted threatened species	No	No

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
				survey		
Wallum Froglet	<i>Crinia tinnula</i>	V		Targeted threatened species survey	No	No
White-bellied Sea-Eagle (breeding)	<i>Haliaeetus leucogaster</i>	V		Targeted threatened species survey	No	No
Little Eagle	<i>Hieraaetus morphnoides</i>	V		Targeted threatened species survey	No	No
Green & Golden Bell Frog	<i>Litoria aurea</i>	E	V	Targeted threatened species survey	No	No
Green-thighed Frog	<i>Litoria brevipalmata</i>	V		Targeted threatened species survey	No	No
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	V		Targeted threatened species survey	No	No
Southern Myotis	<i>Myotis macropus</i>	V		Targeted threatened species survey	Yes	Yes
Barking Owl	<i>Ninox connivens</i>	V		Targeted threatened species survey	No	No
Powerful Owl	<i>Ninox strenua</i>	V		Targeted threatened species survey	No	No
Eastern Osprey (breeding)	<i>Pandion cristatus</i>	V		Targeted threatened species survey	No	No
Southern Greater Glider	<i>Petauroides volans</i>	E	E	Targeted threatened species survey	No	No
Squirrel Glider	<i>Petaurus norfolcensis</i>	V		Targeted threatened species survey	Yes	Yes

Common name	Scientific name	Listing status		Method used to determine presence	Present?	Further assessment required? (BAM Subsections 5.2.5 and 5.2.6)
		BC Act	EPBC Act			
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V		Targeted threatened species survey	No	No
Koala	<i>Phascolarctos cinereus</i>	E	E	Targeted threatened species survey	No	No
Common Planigale	<i>Planigale maculata</i>	V		Targeted threatened species survey	No	No
Masked Owl	<i>Tyto novaehollandiae</i>	V		Targeted threatened species survey	No	No

5.3 Threatened species surveys

All candidate flora species were surveyed in accordance with the Surveying threatened plants and their habitats – NSW survey guide for the Biodiversity Assessment Method (DPIE, 2020d). All surveys were conducted using systematic parallel transects within suitable habitat. Parallel field traverses were separated by 5-10m for orchids, herbs and forbs, 10-15m for sub-shrubs and 10-20m for tree and shrubs.

Table 5.6 Threatened species surveys for candidate flora species credit species on the subject land

Common name	Scientific name	Threatened flora species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
Netted Bottle Brush	<i>Callistemon linearifolius</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 22/01/2021 <input type="checkbox"/> No	9.0 hours (2 person)	No	No
Singleton Mallee	<i>Eucalyptus castrensis</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 25/03/2021 22/01/2021 <input type="checkbox"/> No	2.0 hours (2 person) 9.0 hours (2 person)	No	No
Slaty Red Gum	<i>Eucalyptus glaucina</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 11/07/2024 25/03/2021 22/01/2021 <input type="checkbox"/> No	4.0 hours (2 persons) 2.0 hours (2 person) 9.0 hours (2 person)	No	No
Pokolbin Mallee	<i>Eucalyptus pumila</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 11/07/2024 25/03/2021 22/01/2021 <input type="checkbox"/> No	4.0 hours (2 persons) 2.0 hours (2 person) 9.0 hours (2 person)	No	No
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 10/08/2021 <input type="checkbox"/> No	12.75 hours (2 person)	No	No
Maundia	<i>Maundia</i>	Systematic parallel transects	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	2.0 hours (2 person)	No	No

Common name	Scientific name	Threatened flora species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
triglochinoides	<i>triglochinoides</i>	Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	01/04/2021 25/03/2021		2.0 hours (2 person)	
Tall Knotweed	<i>Persicaria elatior</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 01/04/2021 25/03/2021	<input type="checkbox"/> No	2.0 hours (2 person) 2.0 hours (2 person)	No No
Prasophyllum sp. Wybong	<i>Prasophyllum</i> sp. <i>Wybong</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 16/10/2020	<input type="checkbox"/> No	8.0 hours (2 person)	No No
Singleton Mint-bush	<i>Prostanthera cineolifera</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 16/10/2020	<input type="checkbox"/> No	8.0 hours (2 person)	No No
<i>Pterostylis chaetophora</i>	<i>Pterostylis chaetophora</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 16/10/2020	<input type="checkbox"/> No	8.0 hours (2 person)	Yes Yes
Scrub Turpentine	<i>Rhodamnia rubescens</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 10/08/2021	<input type="checkbox"/> No	12.75 hours (2 person)	No No

Common name	Scientific name	Threatened flora species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (transects or grids)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
Heath Wrinklewort	<i>Rutidosia heterogama</i>	Systematic parallel transects Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes 07/06/2021 <input type="checkbox"/> No	9.0 hours (2 person)	No	No

Table 5.7 Threatened species surveys for candidate fauna species credit species on the subject land

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
Bush Stone-curlew	<i>Burhinus grallarius</i>	Spotlighting Camera Trapping As described in Threatened biodiversity survey and assessment Guidelines for developments and activities (2004 working draft) (DEC 2004)	<input checked="" type="checkbox"/> Yes <u>Spotlighting</u> 27/03/2024 26/03/2024 31/08/2023 01/02/2023 31/01/2022 20/07/2021 20/05/2021 10/05/2021 25/03/2021 24/03/2021 <u>Ground Camera Trapping</u> 09/08/2021 – 21/09/2021	<input type="checkbox"/> No <u>Spotlighting</u> 2.0 hours (1 Person) 1.5 hours (1 Person) 1.0 hours (1 Person) 1.25 hours (1 Person) 2.5 hours (2 People) 0.75 hours (1 Person) 1.0 hours (2 Person) 0.75 hours (1 Person) 1.5 hours (2 Person) 1.0 hours (1 Person) <u>Camera Trapping</u> 42 nights	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
			22/02/2021 - 26/02/2021		4 nights	
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	Avifauna Survey for signs of breeding Significant Tree Survey for habitat trees Methods described in TBDC (DPE 2023b)	<input checked="" type="checkbox"/> Yes <u>Avifauna Survey</u> 31/01/2022	<input type="checkbox"/> No	<u>Avifauna Survey</u> 2.0 hours (2 People)	No No
Glossy Black-Cockatoo (breeding)	<i>Calyptorhynchus lathami</i>	Avifauna Survey for signs of breeding Significant Tree Survey for habitat trees Methods described in TBDC (DPE 2023b)	<input checked="" type="checkbox"/> Yes <u>Avifauna Survey</u> 27/03/2024 06/02/2023 01/02/2023 31/01/2022 09/08/2021 06/08/2021 24/03/2021 23/02/2021	<input type="checkbox"/> No	<u>Avifauna Survey</u> 0.5 hours (1 Person) 0.5 hours (1 Person) 1.0 hours (1 Person) 2.0 hours (2 People) 0.5 hours (1 Person) 1.0 hours (1 Person) 1.5 hours (1 Person) 0.5 hours (1 Person)	No No
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Spotlighting Arboreal Camera Trapping Methods as outlined in Survey guidelines for Australia's threatened mammals (DSEWPaC 2011)	<input checked="" type="checkbox"/> Yes <u>Spotlighting</u> 27/03/2024 26/03/2024 01/02/2023 31/01/2022 25/03/2021 24/03/2021 <u>Arboreal Camera Trapping</u> 28/01/2022 – 05/04/2022 24/09/2021 –	<input type="checkbox"/> No	<u>Spotlighting</u> 2.0 hours (1 Person) 1.5 hours (1 Person) 1.25 hours (1 Person) 2.5 hours (2 People) 1.5 hours (2 Person) 1.0 hours (1 Person) <u>Camera Trapping</u> 67 nights 35 nights	No No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
			19/10/2021 22/02/2021 - 26/02/2021		4 nights	
Wallum Froglet	<i>Crinia tinnula</i>	Nocturnal/Diurnal Aural-visual surveys with Call Playback Methods described in NSW Survey Guide for Threatened Frogs (DPIE 2020d)	<input checked="" type="checkbox"/> Yes <u>Amphibian Survey</u> 27/03/2024 26/03/2024 31/08/2023 01/02/2023 25/03/2021 24/03/2021 *Additional historical surveys conducted in 2009 and 2016	<input type="checkbox"/> No	<u>Amphibian Survey</u> 1.0 hours (1 Person) 0.75 hours (1 Person) 1.0 hours (1 Person) 0.5 hours (1 Person) 2.0 hours (2 People) 0.5 hours (1 Person)	No No
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Avifauna Survey Significant Tree Survey for large stick nests Methods described in TBDC (2023b)	<input checked="" type="checkbox"/> Yes <u>Avifauna Survey</u> 09/08/2021 06/08/2021	<input type="checkbox"/> No	<u>Avifauna Survey</u> 0.5 hours (1 Person) 1.0 hours (1 Person)	No No
Little Eagle	<i>Hieraaetus morphnoides</i>	Avifauna Survey Significant Tree Survey for large stick nests Methods described in TBDC (2023b)	<input checked="" type="checkbox"/> Yes <u>Avifauna Survey</u> 09/08/2021 06/08/2021	<input type="checkbox"/> No	<u>Avifauna Survey</u> 0.5 hours (1 Person) 1.0 hours (1 Person)	No No
Green and Golden Bell Frog	<i>Litoria aurea</i>	Nocturnal/Diurnal Aural-visual surveys with Call Playback Methods described in NSW Survey Guide for Threatened Frogs (DPIE 2020d)	<input checked="" type="checkbox"/> Yes <u>Amphibian Survey</u> 27/03/2024 26/03/2024 01/02/2023 25/03/2021 24/03/2021 *Additional historical	<input type="checkbox"/> No	<u>Amphibian Survey</u> 1.0 hours (1 Person) 0.75 hours (1 Person) 0.5 hours (1 Person) 2.0 hours (2 People) 0.5 hours (1 Person)	No No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)	
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)			
			surveys conducted in 2009 and 2016				
Green-thighed Frog	<i>Litoria brevipalmata</i>	Nocturnal/Diurnal Aural-visual surveys with Call Playback Methods described in NSW Survey Guide for Threatened Frogs (DPIE 2020d)	<input checked="" type="checkbox"/> Yes <u>Amphibian Survey</u> 27/03/2024 26/03/2024 01/02/2023 25/03/2021 24/03/2021 *Additional historical surveys conducted in 2009 and 2016	<input type="checkbox"/> No	<u>Amphibian Survey</u> 1.0 hours (1 Person) 0.75 hours (1 Person) 0.5 hours (1 Person) 2.0 hours (2 People) 0.5 hours (1 Person)	No	No
Square-tailed Kite	<i>Lophoictinia isura</i>	Avifauna Survey Significant Tree Survey for large stick nests Methods described in TBDC (2023b)	<input checked="" type="checkbox"/> Yes <u>Avifauna Survey</u> 31/01/2022	<input type="checkbox"/> No	<u>Avifauna Survey</u> 2.0 hours (2 People)	No	Yes
Southern Myotis	<i>Myotis macropus</i>	Bat Call Surveys Methods described in 'Species credit' threatened bats and their habitats (OEH 2018a)	<input checked="" type="checkbox"/> Yes <u>Anabat Survey</u> 23/01/2024 – 1/02/2024 31/08/2023 (mobile) 01/02/2023 – 06/02/2023 27/02/2022 – 31/02/2023 24/03/2021 – 25/03/2021 25/03/2021 (mobile) 22/02/2021 – 26/02/2021	<input type="checkbox"/> No	<u>Anabat Survey</u> 9 nights 1.0 hours walking survey 5 nights 4 nights 1 night 1.5 hours walking survey 4 nights	Yes	Yes

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
			<u>Harp Trap</u> 24/03/2021 – 23/03/2021		<u>Harp Trap</u> 1 night (2 traps)	
Barking Owl (Breeding)	<i>Ninox connivens</i>	Stagwatching Significant Tree Survey for large hollows Methods described in TBDC (2023b)	<input checked="" type="checkbox"/> Yes <u>Stagwatch Survey</u> 31/08/2023 31/01/2022 20/07/2021 20/05/2021 10/05/2021 25/03/2021	<input type="checkbox"/> No	<u>Stagwatch Survey</u> 1.0 hours (1 Person) 2.0 hours (2 People) 0.75 hours (1 Person) 1.0 hours (1 Person) 0.75 hours (1 Person) 2.0 hours (2 People)	No
Powerful Owl (Breeding)	<i>Ninox strenua</i>	Stagwatching Significant Tree Survey for large hollows Methods described in TBDC (2023b)	<input checked="" type="checkbox"/> Yes <u>Stagwatch Survey</u> 31/08/2023 31/01/2022 20/07/2021 20/05/2021 10/05/2021 25/03/2021	<input type="checkbox"/> No	<u>Stagwatch Survey</u> 1.0 hours (1 Person) 2.0 hours (2 People) 0.75 hours (1 Person) 1.0 hours (1 Person) 0.75 hours (1 Person) 2.0 hours (2 People)	No
Eastern Osprey (breeding)	<i>Pandion cristatus</i>	Avifauna Survey Significant Tree Survey for large stick nests Methods described in TBDC (2023b)	<input checked="" type="checkbox"/> Yes <u>Avifauna Survey</u> 09/08/2021 06/08/2021	<input type="checkbox"/> No	<u>Avifauna Survey</u> 0.5 hours (1 Person) 1.0 hours (1 Person)	No
Southern Greater Glider	<i>Petauroides volans</i>	Spotlighting Camera Trapping Methods as outlined in Survey guidelines	<input checked="" type="checkbox"/> Yes <u>Spotlighting</u> 27/03/2024 26/03/2024 31/08/2023 01/02/2023	<input type="checkbox"/> No	<u>Spotlighting</u> 2.0 hours (1 Person) 1.5 hours (1 Person) 1.0 hours (1 Person) 1.25 hours (1 Person)	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
		for Australia’s threatened mammals (DSEWPaC 2011)	31/01/2022 20/07/2021 20/05/2021 10/05/2021 25/03/2021 24/03/2021 <u>Arboreal Camera Trapping</u> 05/04/2022 – 27/05/2022 28/01/2022 – 05/04/2022 24/09/2021 – 19/10/2021 22/02/2021 - 26/02/2021	2.5 hours (2 People) 0.75 hours (1 Person) 1.0 hours (2 Person) 0.75 hours (1 Person) 1.5 hours (2 Person) 1.0 hours (1 Person) <u>Camera Trapping</u> 52 nights 67 nights 35 nights 4 nights		
Squirrel Glider	<i>Petaurus norfolcensis</i>	Spotlighting Camera Trapping Methods as outlined in Survey guidelines for Australia’s threatened mammals (DSEWPaC 2011)	<input checked="" type="checkbox"/> Yes <u>Spotlighting</u> 27/03/2024 26/03/2024 31/08/2023 01/02/2023 31/01/2022 20/07/2021 20/05/2021 10/05/2021 25/03/2021 24/03/2021 <u>Arboreal Camera Trapping</u> 05/04/2022 –	<input type="checkbox"/> No	Yes	Yes

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
			27/05/2022 28/01/2022 – 05/04/2022 24/09/2021 – 19/10/2021 22/02/2021 - 26/02/2021	52 nights 67 nights 35 nights 4 nights		
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Spotlighting Camera Trapping Methods described in TBDC (2024b)	<input checked="" type="checkbox"/> Yes <u>Spotlighting</u> 27/03/2024 26/03/2024 01/02/2023 31/01/2022 20/05/2021 10/05/2021 25/03/2021 24/03/2021 <u>Arboreal Camera Trapping</u> 05/04/2022 – 27/05/2022 28/01/2022 – 05/04/2022 22/02/2021 - 26/02/2021	<input type="checkbox"/> No <u>Spotlighting</u> 2.0 hours (1 Person) 1.5 hours (1 Person) 1.25 hours (1 Person) 2.5 hours (2 People) 1.0 hours (2 Person) 0.75 hours (1 Person) 1.5 hours (2 Person) 1.0 hours (1 Person) <u>Camera Trapping</u> 52 nights 67 nights 4 nights	No	No
Koala	<i>Phascolarctos cinereus</i>	Spotlighting Camera Trapping Methods outlined in Koala (Phascolarctos	<input checked="" type="checkbox"/> Yes <u>Spotlighting</u> 27/03/2024 26/03/2024 31/08/2023 01/02/2023	<input type="checkbox"/> No <u>Spotlighting</u> 2.0 hours (1 Person) 1.5 hours (1 Person) 1.0 hours (1 Person) 1.25 hours (1 Person)	No	No

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)	Effort (hours & no. people)		
		cinereus) Biodiversity Assessment Method Survey Guide (DPE 2022)	31/01/2022 20/07/2021 20/05/2021 10/05/2021 25/03/2021 24/03/2021 <u>Arboreal Camera Trapping</u> 05/04/2022 – 27/05/2022 28/01/2022 – 05/04/2022 24/09/2021 – 19/10/2021 22/02/2021 - 26/02/2021	2.5 hours (2 People) 0.75 hours (1 Person) 1.0 hours (2 Person) 0.75 hours (1 Person) 1.5 hours (2 Person) 1.0 hours (1 Person) <u>Camera Trapping</u> 52 nights 67 nights 35 nights 4 nights		
Common Planigale	<i>Planigale maculata</i>		<input checked="" type="checkbox"/> Yes <u>Spotlighting</u> 27/03/2024 26/03/2024 31/08/2023 01/02/2023 31/01/2022 20/07/2021 20/05/2021 10/05/2021 25/03/2021 24/03/2021 <u>Ground Camera Trapping</u> 09/08/2021 –	<input type="checkbox"/> No <u>Spotlighting</u> 2.0 hours (1 Person) 1.5 hours (1 Person) 1.0 hours (1 Person) 1.25 hours (1 Person) 2.5 hours (2 People) 0.75 hours (1 Person) 1.0 hours (2 Person) 0.75 hours (1 Person) 1.5 hours (2 Person) 1.0 hours (1 Person) <u>Camera Trapping</u> 42 nights		

Common name	Scientific name	Threatened fauna species surveys			Present	Further assessment required (BAM Subsections 5.2.5 and 5.2.6)
		Survey method (e.g. harp trap, Elliott trap, bioacoustics, etc.)	Timing of survey – within recommended period? (BAM-C / TBDC)			
			21/09/2021 22/02/2021 - 26/02/2021		4 nights	
Masked Owl (breeding)	<i>Tyto novaehollandiae</i>	Stagwatching Significant Tree Survey for large hollows Methods described in TBDC (2023b)	<input checked="" type="checkbox"/> Yes <u>Stagwatch Survey</u> 31/08/2023 31/01/2022 20/07/2021 20/05/2021 10/05/2021 25/03/2021	<input type="checkbox"/> No	<u>Stagwatch Survey</u> 1.0 hours (1 Person) 2.0 hours (2 People) 0.75 hours (1 Person) 1.0 hours (1 Person) 0.75 hours (1 Person) 2.0 hours (2 People)	No No

5.4 Expert reports

No expert reports were required.

5.5 Area or count, and location of suitable habitat for a species credit species (a species polygon)

Pterostylis chaetophora was found to occur on site and will require offsetting. In considering information within the TBDC (DPE 2024b) including that paddock trees are important habitat, the Species Polygon will include vegetation zones that were not highly derived and disturbed from cattle grazing and past agricultural practices (PCT 3444 Moderate and PCT 3328 Moderate) and accounts for a total area of 0.87ha. Species polygon for *Pterostylis chaetophora* is shown in 5.1.

Petaurus norfolcensis (Squirrel Glider) was found to occur on site and will require offsetting. Species Polygon will include all areas of vegetation zones that contained canopy species (PCT 3444 Moderate and PCT 3328 Moderate) and accounts for a total area of 0.87ha. Species polygon for Squirrel Glider is shown in 5.2.

Myotis macropus (Southern Myotis) was recorded in the subject land and will require offsetting. Species polygon for this species must include “the range of PCTs associated with the species (as per the TBDC) within 200 meters of any medium to large permanent creeks, rivers, lakes or other waterways” (OEH 2018a). Permanent waterways included the constructed dam in the south-east of the subject land, another constructed dam just south of the subject land and areas of floodplain to the east of the subject land that permanently contain surface water (determined from review of past aerial imagery). The top of bank of these waterbodies was mapped using aerial imagery and ground data. A 200m buffer was drawn around these identified features and all areas of mapped native vegetation that fell within the buffer was included in the species polygon. Species Polygon for Southern Myotis accounts for a total area of 3.34ha. Species polygon for Southern Myotis is shown in 5.3.

Figure 5.1 *Pterostylis chaetophora* Species Polygon



Legend

- Subject Land
- Study Area
- Pterostylis chaetophora* Species Polygon (0.87ha)

Job Ref	12503
A4 Scale	1:3,500

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.




0 50 100 150 m

 Map Projection GDA2020 MGA Zone 56
 Data Sources: LPI (2024), Rearmap (11/06/2024)

Figure 5.1
Pterostylis chaetophora
Species Polygon

Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW

24 July 2024

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 ABN 41 003 509 215

Figure 5.2 *Petaurus norfolcensis* (Squirrel Glider) Species Polygon



Job Ref	12503
A4 Scale	1:3,500

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 portrayed 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.

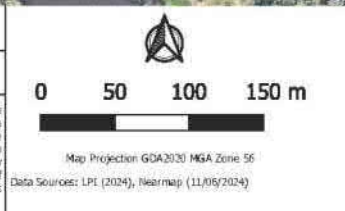


Figure 5.2
Petaurus norfolcensis (Squirrel Glider)
 Species Polygon
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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Figure 5.3 *Myotis macropus* (Southern Myotis) Species Polygon



Job Ref	12503
A4 Scale	1:3,500

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 portrayed 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.

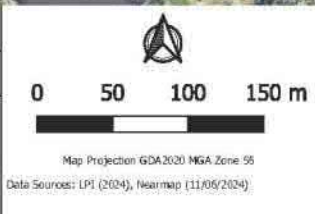


Figure 5.3
Myotis macropus (Southern Myotis)
Species Polygon
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

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6.0 Identifying prescribed impacts

The subdivision area contains the following prescribed impacts outlined in Table 6.1.

Table 6.1 Prescribed impacts identified

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
Karst, caves, crevices, cliffs, rocks or other geological features of significance	<input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	N/A	N/A
Human-made structures	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	One old open shed was present outside of the impact area. The structure was not found to include suitable habitat for microchiropteran bats to use	Microchiropteran bats.
Non-native vegetation	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	The subject land contained 5.37ha of non-native vegetation (Figure 4.1) consisting of pasture grasses . (Plates 4.1-6.).	Hunting avifauna species such as <i>Lophoictinia isura</i> (Square-tailed Kite) (Foraging) and <i>Hieraaetus morphnoides</i> (Little Eagle) (foraging).
Habitat connectivity	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	The subject land does not contain any mapped fauna corridors (DPIE 2020f). However, the subject lands is connected to more extensive remnant vegetation to the east and south, however is fragmented by Mount Vincent Road, Maitland Waste Station, NSW Rural Fire Service Lower Hunter station, and scattered residential & rural development, cleared agricultural and other lands.	Highly mobile threatened species such as woodland birds (e.g. <i>Glossopsitta pusilla</i> (Little Lorikeet) and arboreal mammals like <i>Petaurus norfolcensis</i> (Squirrel Glider).
Waterbodies, water quality and hydrological processes	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	A first order prescribed stream is present within the subject site, which turns into a second order stream off site. The stream flows south-westwards, where it enters a freshwater wetland (Figure 3.2). One constructed dam is present in the subject land. Groundwater Dependent Ecosystems (GDE's) are ecosystems that are fully or partially dependent on groundwater to maintain	Amphibians, aquatic avifauna and hunting avifauna as well as microchiropteran bats (foraging).

Feature	Present	Description of feature characteristics and location	Threatened entities that use, are likely to use, or are part of the habitat feature. Where relevant, threatened species or fauna that are part of a TEC or EC, that are at risk of vehicle strike
		ecosystem function. GDEs were located within and surrounding the subject land.	
Wind turbine strikes (wind farm development only)	<input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	N/A	N/A
Vehicle strikes	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	The subdivision area will allow for the inclusion of additional roadways to facilitate access for future residential development.	Mobile threatened species such as avifauna, microchiropteran bats, and mammals like <i>Petaurus norfolcensis</i> (Squirrel Glider).

Stage 2: Impact assessment (biodiversity values and prescribed impacts)

7.0 Avoid and minimise impacts

7.1 Avoid and minimise direct and indirect impacts

7.1.1 Project location

The project has been located for the majority over areas of non-native vegetation and derived grassland forms of native vegetation. This has avoided impacting areas of better-quality vegetation within the east of the study area. This has also minimised the number of trees requiring removal for the proposal.

7.1.2 Project design

The design of the proposed development is such a large portion of APZ is over non-native vegetation or the existing electrical easement. This has minimised the impact to native vegetation and the amount of trees requiring removal for the APZ. The proposal has also been designed such that the shape follows existing boundaries of patches of habitat/ forest. This minimises the creation of new edges of the patches and edge effects.

7.2 Avoid and minimise prescribed impacts

7.2.1 Project location

The development site has been positioned within a location that has been previously subject to disturbances such as likely past agricultural practices. The proposed location of the subdivision allows for the retention of native vegetation in the east of the study area. This minimises impact to the vegetation corridor running north/south through the study area.

7.2.2 Project design

The proposal has been designed such that the shape follows existing boundaries of patches of habitat/ forest. This has avoided cutting into existing patches of habitat and minimised impacts to connectivity through the site.

7.3 Other measures considered

A Vegetation Management Plan (VMP) has been recommended to be implemented for the remainder of the study area outside the future proposed Stage 4 area. The objectives of the VMP include:

- To ensure the ongoing ecological viability of the retained areas of vegetation by protecting the ecological biodiversity and habitat values of the land;
- To provide compensatory habitat with the installation of nest boxes.

7.4 Summary of measures to avoid and minimise impacts

Table 7.1 documents the measures to avoid and minimise direct, indirect and prescribed impacts associated with any future planning proposal for the development.

Table 7.1 Avoidance and minimisation measures for direct, indirect and prescribed impacts

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
Removal of 3.95ha of native vegetation	Locating the development area within a location that has been previously subject to disturbances such as past agriculture practices and that is largely covered in non-native vegetation.	The development area has been located to minimise impacts to higher quality native vegetation and threatened species habitat. Vegetation replanting will increase the quality of retained native vegetation.	During the Design phase	Project designer
Connectivity (habitat fragmentation) (Design phase)	Project has been designed so that vegetation in the corridor along the east of the subject land is primarily retained. Locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained. Trees in the east of the subject land that fall within the APZ should be retained wherever possible.	The removal of vegetation for the proposal will create a slight narrowing of the north-south corridor, it will not fragment connection to retained vegetation and the replanting of vegetation within this retained area will strengthen the connectivity.	During the Design and construction phase	Project designer Project manager
Loss of Squirrel Glider habitat	A total of 0.87ha of Squirrel Glider habitat including habitat trees will be removed as a result of the development. Tree limbs containing natural hollows should be relocated and restored for use by fauna in the nearest adjacent area of similar habitat by a suitably qualified ecologist. Where natural hollows cannot be relocated, an artificial nest box should be installed onto a tree in the nearest adjacent area of similar habitat by a suitably qualified ecologist at a ratio of 2:1. Trees in the east of the subject land that fall within the APZ should be retained wherever possible.	A net positive increase of squirrel glider nesting habitat within the locality, a retention of key connections and an improvement of habitat connectivity.	During the Construction phase	Project manager
Impact on breeding populations	Timing of vegetation clearance should also occur outside of the bird nesting season (late August - December). As barn owls have previously been	Timing works to avoid critical life cycle events such as breeding for avifauna species.	During construction phase	Project manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	recorded within hollow-bearing trees in the west of the subject land. It is recommended that these trees undergo preclearance inspection via EWP or climbing arborist to determine if the barn owls are roosting or nesting. In the case where they are roosting or nesting an expert on owls should be consulted for a plan of action.			
Reduced viability of adjacent habitat due to artificial light spill	Directing artificial lighting such as security lighting, street lighting, etc. away from adjacent habitat and angled downwards to avoid excessive light pollution affecting adjacent habitat.	Avoid excessive light pollution affecting adjacent habitat.	During the construction and operational phases	Project designer, construction site manager and project manager
Reduced viability of adjacent habitat due to noise, dust, light spill, edge effects and weed incursion	The Asset Protection Zones (APZs) associated with the development along the boundary between the development area and retained vegetation to the east to create a vegetated buffer between conserved vegetation.	Minimise clearance along the boundary of the retained vegetation to minimise edge effects, weed incursion, light spill and filter noise.	During the design phase	Project designer
Impact on waterbodies, water quality and hydrological processes	Silt fencing and controls on sediment and runoff must be implemented prior to any construction within the subject land The proposed basin has been designed to minimise impacts on surface water quality and quantity through planting of native vegetation within and on the batter of the basin as well as water velocity controls (mixed rocks) (Paul Scrivener Landscape 2024).	Minimise potential for impacts to surface water quality and quantity.	During the Design phase, construction phase and operational phases	Project designer, construction site manager and project manager
Increased risk of starvation, exposure and loss of shade or shelter	Where possible, construction works for any future planning proposal should avoid any impact to mature trees and hollow-bearing trees.	The retention of mature trees, hollow-bearing trees and 10.05ha of the 16.18ha native vegetation within the study area will provide food and shelter resources within the immediate	During the Design phase and construction phase	Project designer

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
Clearing of native vegetation	<p>Where possible, construction works for any future planning proposal should avoid any impact to mature trees and hollow-bearing trees. Where unavoidable, works should minimise impacts to mature trees as follows:</p> <ul style="list-style-type: none"> clearing limits will be clearly marked to prevent unnecessary clearing beyond the extent of the development footprint. Tree clearing and disturbance will be limited to the development site; where a tree must be disturbed the priority should be given to pruning rather than clearing; and the clearing of any trees should be undertaken in a manner that avoids damaging adjacent vegetation i.e., all trees should be felled into disturbed areas when feasible; <p>Individual trees that are to be retained are to be protected during construction by temporary fence around the dripline.</p>	<p>locality.</p> <p>Retention of mature trees and hollow-bearing trees within the retained 10.05ha of native vegetation in the study area will facilitate the movement of mobile threatened species and provide foraging, nesting and shelter/shade resources.</p>	<p>Prior to and during vegetation clearing in the construction phase</p>	<p>Construction site manager</p>
Inadvertent impact to biodiversity values	<p>Priority will be given during construction to avoid any inadvertent impact to significant biodiversity values within the subject land. Avoidance measures should include the following:</p> <ul style="list-style-type: none"> 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; and implementation of temporary stormwater controls during construction and to ensure that 	<p>Avoid inadvertent impact to biodiversity values</p>	<p>Prior to and during vegetation clearing</p>	<p>Construction site manager</p>

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	<p>discharges outside the development footprint are consistent with existing conditions.</p>			
<p>Clearing of fauna habitat, resulting in arboreal fauna injury and/or mortality</p>	<p>Trees within the subject land are to undergo a preclearance survey (thorough inspection of the canopy) every morning prior to tree clearance operations by a suitably qualified ecologist, particularly for arboreal species just prior to removal/trimming. If a Koala is found clearing activities are to cease until the animal has left on its own accord.</p> <p>As barn owls have previously been recorded within hollow-bearing trees in the west of the subject land. It is recommended that these trees undergo preclearance inspection via EWP or climbing arborist to determine if the barn owls are roosting or nesting. In the case where they are roosting or nesting an expert on owls should be consulted for a plan of action.</p> <p>Searches are also to be undertaken for bird nests that are currently being utilised for breeding.</p> <p>Any animals injured during construction should be taken immediately to a Vet for treatment. Any animals suspected to require rehabilitation would be delivered post-veterinary care to an appropriate animal rehabilitator.</p>	<p>Clearing of fauna habitat, resulting in fauna injury and/or mortality</p>	<p>During vegetation clearing</p>	<p>Construction site manager</p>
<p>Clearing of fauna habitat, resulting in ground dwelling fauna injury and/or mortality</p>	<p>Prior to the removal of vegetation from the subject land barrier fencing is to be installed along the retained vegetation to prevent ground dwelling species entering the development area.</p>	<p>Clearing of fauna habitat, resulting in fauna injury and/or mortality</p>	<p>During vegetation clearing</p>	<p>Construction site manager</p>

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	<p>Vegetation within the subject land is to undergo pre-clearance searches for ground dwelling species such as frogs to relocate captured specimens into the retained vegetation on the other side of the barrier fencing.</p>			
<p>Clearing of fauna habitat and displacement of resident fauna</p>	<p>As barn owls have previously been recorded within hollow-bearing trees in the west of the subject land. It is recommended that these trees undergo pre-clearance inspection via EWP or climbing arborist to determine if the barn owls are roosting or nesting. In the case where they are roosting or nesting an expert on owls should be consulted for a plan of action.</p> <p>A suitably qualified and experienced ecologist should be engaged to supervise removal of all significant habitat features, including hollow-bearing trees and maintain a vegetation clearance register which should include the location, type, size of felled habitat trees and any contact with resident fauna.</p> <p>The supervising ecologist will work co-operatively with the plant operator to develop an adaptive clearance methodology that should minimise impacts to potential resident fauna whilst being conducted according to safe work methods.</p> <p>The adaptive clearance methodology should include the following key aspects:</p> <ul style="list-style-type: none"> seeking consultation with a suitably qualified ecologist to determine the best time to schedule clearance works to avoid nesting and 	<p>Avoid fauna injury and/or mortality during clearing of vegetation.</p>	<p>During vegetation clearing</p>	<p>Construction site manager</p>

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	<p>breeding times for resident fauna;</p> <ul style="list-style-type: none"> • preclearance surveys completed on the morning of any clearance works to determine if any nesting birds or canopy dwelling mammals are within the clearance footprint; • clearing utilising a 'soft felling' technique in which trees are 'nudged' by machinery and fauna given time to leave (overnight), before slowly felling the tree the following day; • if fauna is identified within the proposed clearing area prior to clearing, or after 'nudging' the tree, operations will cease until the fauna has moved to a safe location or has been relocated. If fauna flee into a habitat tree demarcated for removal this tree should be left to fell until the following day; • any captured displaced fauna relocated to the nearest area of appropriate habitat. If arboreal, the fauna to be placed inside an artificial nest box and relocated. If the displaced fauna is nocturnal relocation to occur during dusk; and • all hollow logs and felled trees would be inspected by the ecologist before relocation into areas of similar adjacent habitat <p>All habitat tree felling activities and results to be summarised in a tree clearance report by the supervising ecologist, including fauna injuries.</p> <p>Any animals injured during construction should be taken immediately to the nearest Veterinary Hospital for treatment. Any animals suspected to require</p>			

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	<p>rehabilitation would be delivered post-veterinary care to an appropriate animal rehabilitator associated with Hunter Wildlife (NATF Inc) Rescue phone no. 0418 628 483.</p> <p>All fauna sightings/captures are to be recorded and uploaded to the NSW BioNet Atlas.</p>			
<p>Works around aquatic habitat</p>	<p>Measures should be taken to avoid erosion where the water is being relocated to including erosion fencing to ensure no excess sediment is able to enter the surrounding habitat.</p> <p>A suitably qualified and experienced ecologist should be engaged to supervise the clearing of vegetation in the aquatic vegetation in the south of the subject land and capture and relocate fauna.</p> <p>Vegetation should undergo a pre-clearance search by the ecologist to flush out any aquatic birds and relocated any frogs or other species found prior to works commencing.</p> <p>Disposable gloves and clean (new) plastic bags should be used to capture and handle frogs in line with hygiene protocols.</p> <p>Any animals injured during dewatering should be taken immediately to the nearest Veterinary Hospital for treatment. Any animals suspected to require rehabilitation would be delivered post-veterinary care to an appropriate animal rehabilitator associated with Hunter Wildlife (NATF Inc) Rescue phone no. 0418 628</p>	<p>Avoid fauna injury and/or mortality during clearing of aquatic vegetation</p>	<p>During dam dewatering</p>	<p>Construction site manager</p>

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	483. All fauna sightings/captures are to be recorded and uploaded to the NSW BioNet Atlas.			
Loss of significant habitat features	Habitat salvage within the development footprint should be undertaken prior to and during clearance activities, with the salvage methodology including the following key aspect: <ul style="list-style-type: none"> • Tree limbs containing natural hollows deadwood should be relocated and restored for use by fauna in the nearest adjacent area of similar habitat by a suitably qualified ecologist. Where natural hollows cannot be relocated, an artificial nest box should be installed onto a tree in the nearest adjacent area of similar habitat by a suitably qualified ecologist at a ratio of 2:1. Where removal of woody debris is required: <ul style="list-style-type: none"> • dead trees and woody debris that are removed (diameter >10 cm) are to be placed in the nearest adjacent area of similar habitat under supervision of a suitably qualified ecologist. 	Salvage of significant habitat features to create habitat within adjoining vegetation	Prior to and during vegetation clearing	Construction site manager and suitably trained fauna handler
Transport of weeds and pathogens from the site to adjacent vegetation	The following measures are to be implemented to prevent exotic plant material from entering/exiting the subject land: <ul style="list-style-type: none"> • no imported/exported material to be permitted unless it has been inspected and confirmed to be free of dirt and mud which may contain weed seeds and vegetative material such as 	Minimise weed infestations within adjoining vegetation	Prior to and during vegetation clearing	Construction Site Manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	<ul style="list-style-type: none"> bulbs, root fragment, tubers or rhizomes; and vehicles and machinery to be clean of soils, vegetation and seeds that have been brushed off or washed down prior to entering the study area <p>A clean down register to be maintained at the entry of the study area</p>			
Impact to adjoining native vegetation via increase in wood collection and human activity	Erection of a fauna friendly fencing along the eastern boundary of the development area. Erection of signs to the prevention of wood collection in the area.	Inform and educate of the environmental significance of adjoining vegetation.	Construction and operational phase	Construction site manager and Project manager
Vehicle strike	Implementation of a low-speed limit within the development area.	Reduce the likelihood and occurrence of vehicle strikes with fauna within the locality	Construction and operational phase	Construction site manager and Project manager

8.0 Impact assessment

8.1 Direct impacts

8.1.1 Residual direct impacts

Table 8.1 documents impact likely to occur on the subject land associated with any future planning proposal for the development area after steps taken to avoid and minimise impacts.

Table 8.1 Summary of residual direct impacts

Direct impact	BC Act status	EPBC Act status	SAIL entity	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Extent (ha, number of individuals)
Removal of PCT 3444 - Lower Hunter Spotted Gum-Ironbark Forest	-	-	No	Construction and operation	2.78
Removal of PCT 3328 - Lower Hunter Red Gum-Paperbark Riverflat Forest	-	-	No	Construction and operation	0.48
Removal of PCT 3975 - Southern Lower Floodplain Freshwater Wetland	-	-	No	Construction and operation	0.19
Removal of PCT 3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest	-	-	No	Construction and operation	0.50
Removal of Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	E3	-	No	Construction and operation	2.78
Removal of the EEC Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	E3	-	No	Construction and operation	0.49

Direct impact	BC Act status	EPBC Act status	SAIL entity	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Extent (ha, number of individuals)
Removal of Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E3	-	No	Construction and operation	0.19
Removal of <i>Pterostylis chaetophora</i> habitat	V		No	Construction and operation	0.87
Removal of <i>Petaurus norfolcensis</i> (Squirrel Glider) habitat	V	-	No	Construction and operation	0.87
Removal of <i>Myotis macropus</i> (Southern Myotis) habitat	V		No	Construction and operation	3.34

8.1.2 Change in vegetation integrity score

Table 8.2 documents change in vegetation integrity score on the subject land associated with any future planning proposal for the development area.

Table 8.2 Impacts to vegetation integrity

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development				After development				Change
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
PCT 3444_Moderate	3444	Removal	0.65	52.5	20.8	65.6	41.5	0	0	0	0	-41.5
PCT 3444_Moderate	3444	APZ	0.04	52.5	20.8	65.6	41.5	37.5	0.9	0	3.2	-38.3
PCT 3444_Derived Grassland	3444	Removal	1.83	45.5	6.8	18.6	17.9	0	0	0	0	-17.9
PCT 3444_Derived Grassland	3444	APZ	0.26	45.5	6.8	18.6	17.9	40.6	6.8	0	6.5	-11.4
PCT 3328_Moderate	3328	Removal	0.17	19	33.3	64.4	34.4	0	0	0	0	-34.4

Vegetation zone	PCT ID	Management zone	Area (ha)	Before development				After development				Change
				Composition	Structure	Function	VI score	Composition	Structure	Function	VI score	Change in VI score
PCT 3328 _Moderate	3328	APZ	0.01	19	33.3	64.4	34.4	18	6.5	0	4.9	-29.5
PCT 3328 _Derived Grassland	3328	Removal	0.26	26.6	36	15.5	24.6	0	0	0	0	-24.6
PCT 3328 _Derived Grassland	3328	APZ	0.04	26.6	36	15.5	24.6	25.7	35.4	0	9.7	-14.9
PCT 3975_Fair	3795	Removal	0.19	30.1	39.3	-	54.1	0	0	-	0	-54.1
PCT 3446 _Carex Dominant	3446	Removal	0.39	12.2	37.1	0.4	5.9	0	0	0	0	-5.9
PCT 3446 _Carex Dominant	3446	APZ	0.11	12.2	37.1	0.4	5.9	12.2	37.1	0	7.7	1.8

8.2 Residual Indirect impacts

Table 8.3 documents residual indirect impacts of the proposal (likely to occur on native vegetation, threatened entities and their habitat beyond the development footprint) as a result of any future planning proposal associated with the subdivision area.

Table 8.3 Summary of residual indirect impacts

Indirect impact	Impacted entities	Extent (ha or zone reference)	Frequency	Duration (long-term/short-term/medium-term)	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
Sedimentation and contaminated and/or nutrient rich run-off	Adjacent vegetation, including freshwater	Surrounding vegetation outside the subject land	During heavy rainfall or storm events	Long-term	Construction and operation phase	During the construction and operation phase, potential sediment and contaminated runoff into adjacent vegetation, including groundwater

Indirect impact	Impacted entities	Extent (ha or zone reference)	Frequency	Duration (long-term/short-term/medium-term)	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
	wetland	boundary				dependent ecosystems is likely to occur during high rainfall events.
Changing surface water characteristics	Adjoining groundwater dependant ecosystems	Surrounding vegetation outside the subject land boundary	During heavy rainfall or storm events	Long-term	Construction and operation phase	During the construction and operation phase, potential surface water runoff into adjacent vegetation, including groundwater dependent ecosystems is likely to occur during high rainfall events.
Transport of weeds and pathogens from the subject land to adjacent vegetation	Adjacent freshwater wetland	Surrounding vegetation outside the subject land boundary	Daily during the construction phase and ongoing during the operation phase	Long-term	Construction and operation phase	The development area is at least 50m from freshwater wetlands. This increases the risk of the spread of weeds with the establishment of non-native grassed areas within the subject land and potential of exotic plant and lawn clipping dumping within adjacent vegetation
Inadvertent impacts on adjacent habitat or vegetation	Adjacent vegetation, including freshwater wetland	Surrounding vegetation outside the subject land boundary	Daily during the construction phase and ongoing during the operation phase	Long-term	Construction and operation phase	The development area is located at least 50m from freshwater wetlands. Any future planning proposal increases the risk of inadvertent impacts on adjacent habitat and vegetation.
Reduced viability of adjacent habitat due to edge effects	Adjacent vegetation, including Mambo Wetland Reserve	Surrounding vegetation outside the subject land boundary	During the life of any future planning proposal	Long-term	Construction and operation phase	The subject land borders a vegetation corridor running through the east of the study area. Removal of vegetation from the subject land increases the risk of edge effects occurring within the corridor.
Fertiliser and herbicide drift	Adjacent vegetation.	Surrounding vegetation outside the	During the life of any future planning proposal.	Long-term	Construction and operation phase	Any future landscaping within the development footprint may increase fertiliser and herbicide drift into adjacent

Indirect impact	Impacted entities	Extent (ha or zone reference)	Frequency	Duration (long-term/short-term/medium-term)	Project phase/timing of impact (e.g. construction, operation, rehabilitation)	Likelihood and consequences
		subject land boundary				vegetation.
Rubbish dumping	Adjacent vegetation	Surrounding vegetation outside the subject land boundary	During the life of any future planning proposal	Long-term	Construction and operation phase	Any future development may increase the occurrence of rubbish dumping within adjoining vegetation
Increase in wood collection and human activity in retained vegetation	Adjacent vegetation	Surrounding vegetation outside the subject land boundary	During the life of any future planning proposal	Long-term	Construction and operation phase	Any future development may increase the occurrence of rubbish dumping within adjoining vegetation
Fragmentation of movement corridor	Mammals and reptiles	Surrounding vegetation outside the subject land boundary	During the life of any future planning proposal	Long-term	Construction and operation phase	The development will slightly reduce the north-south corridor in the east of the study area. The aquatic corridor to the south of the subject land is not likely to be significantly impacted.

8.3 Prescribed impacts

All prescribed impacts identified in Section 6.0 assessed as occurring within the subdivision area as a result of any future planning proposal have been addressed below. Mitigation measures for prescribed impacts are detailed within Table 8.6.

8.3.1 Non-native vegetation

8.3.1.1 Nature

1. Likely removal of non-native habitat.

8.3.1.2 Extent

Removal of 5.37ha of non-native vegetation in the form of introduced maintained grasses in the south of the subject land.

8.3.1.3 Duration

The construction and operational phase.

8.3.1.4 Consequences

Reduction in grazing habitat for macropod species. Reduction in hunting habitat for highly mobile avifauna species that hunts in open areas, namely raptors and microchiropteran bats.

8.3.1.5 Residual prescribed impact

The removal of 5.23ha of non-native vegetation is unlikely to have a significant impact on these species due to the presence of open non-native grassed areas to the west and south of the subject land. Therefore, there is no residual prescribed impact.

8.3.2 Habitat connectivity

8.3.2.1 Nature

Narrowing of habitat corridor.

8.3.2.2 Extent

Narrowing of north-south corridor running along creekline in east of study area particularly in the south-east corner.

8.3.2.3 Duration

The construction and operational phase.

8.3.2.4 Consequences

The north-south habitat corridor will be slightly reduced, which could slightly restrict movement of mobile mammal species, notably Squirrel Glider. The aquatic corridor to the south of the subject land is not likely to be significantly impacted.

8.3.2.5 *Residual prescribed impact*

Minimisation and mitigation measures have been detailed within Table 7.1 which prioritizes the retention of trees in the APZ on the eastern side of the proposal. It is recommended that trees be retained within the APZ such that the largest distance between any two trees is no more than 30m. Gaps of more than 35m wide have been considered a potential barrier to crossing (LMCC 2015). Existing connections to habitat north of Wilton Drive and east across Mount Vincent Road will not be impacted and contain gaps on 20m between canopies. Therefore, the corridor will not be narrowed to the point that it will have significant impact on the species using it and there is no residual prescribed impact.

8.3.3 Waterbodies, water quality and hydrological processes

8.3.3.1 *Nature*

Groundwater Dependent Ecosystems (GDE's) are ecosystems that are fully or partially dependent on groundwater to maintain ecosystem function. These ecosystems occur across both surface and subsurface landscapes and are highly variable.

8.3.3.2 *Extent*

Two GDE's were found to be present within the subject land contained species that are likely to be opportunistic facultative GDEs that may depend on the subsurface presence of groundwater (often accessed via the capillary fringe – subsurface water just above the water table). This capillary water may be accessed by the plants where an alternative source of water (i.e. rainfall) cannot be accessed during excessive dry periods to maintain ecological function. As the plants within these PCTs may at times rely on capillary water in the soil that rises from the water table, any lowering of the water table may result in a reduction in groundwater availability and if this occurs during a period of low rainfall, may contribute to declining vegetation health over the short-term. However, if the groundwater table is shallow where the potential GDE occurs and there is no perched aquifer above the water table (separated from the water table by a layer of impermeable rock or sediment), then impacts on vegetation health may also occur over the short-term during construction

PCT 3975 in the far south of the subject land is an obligate GDE. The majority of this PCT within the study area occurs outside the proposed impact. The proposed basin will be located on the edge of the wetland/floodplain. It has been designed to filter water from the residential development before flows down into the wetland.

A list of GDE's present within the subject land and their groundwater dependency is shown in Table 8.4.

Table 8.4 Groundwater Dependent Ecosystems present in the study area.

Ecosystem	Ecosystem Type	Groundwater System	Groundwater Dependency
PCT 3444 - Lower Hunter Spotted Gum-Ironbark Forest	Terrestrial Vegetation		Non-Groundwater Dependent
PCT 3328 - Lower Hunter Red Gum-Paperbark Riverflat Forest	Terrestrial Vegetation		Facultative
PCT 3446 - Lower North Foothills Ironbark-Box-Gum Grassy Forest	Terrestrial Vegetation		Facultative (few native species present are) opportunistic facultative
PCT 3975 - Southern Lower Floodplain Freshwater Wetland	Wetland		Obligate

Key to Groundwater Dependency

Obligate - Contain species which rely exclusively on groundwater to survive

Facultative - Contain species which retrieve groundwater located in the capillary fringe or area above the saturated zone

Non-Groundwater Dependent - Have no reliance on groundwater reserves

8.3.3.3 Duration

Construction and operational phase of the subsequent subdivision

8.3.3.4 Consequences

Potential long-term impacts to retained neighbouring vegetation south of the subject land. Minimisation and mitigation measures have been detailed within Table 7.1 which include installation of sediment retention fencing during construction and the design of the bio-basin that will be constructed adjacent the wetland. The design has considered planting of native species and using mixed rocks to decrease the velocity of water moving through the basin (Paul Scrivener Landscaping 2024). The basin will filter water going into the wetland and minimise the impacts to water quality.

8.3.3.5 Maximum predicted offset liability

N/A as minimisation and mitigation measures have been detailed within Table 7.1 and Table 8.6.

8.3.4 Vehicle strikes

Residual predicted impacts of vehicle strike on threatened fauna recorded within the subject land are documented within Table 8.5.

Table 8.5 Prescribed impacts – vehicle strikes

Threatened fauna recorded within the subject land that are that are at risk of vehicle strike	SAIL entity	Likelihood	Estimated vehicle strike rates	Consequences
<i>Petaurus norfolcensis</i> (Squirrel Glider)	No	Low	Unknown	Injury, mortality, reduction in local population
<i>Pteropus poliocephalus</i> (Grey-headed Flying-Fox)	No	Unlikely	Unknown	Injury, mortality, reduction in local population
<i>Falsistrellus tasmaniensis</i> (Eastern False Pipistrelle)	Yes	Unlikely	Unknown	Injury, mortality, reduction in local population
<i>Miniopterus australis</i> (Little Bent-winged Bat)	Yes	Unlikely	Unknown	Injury, mortality, reduction in local population
<i>Miniopterus orianae oceanensis</i> (Large Bent-winged Bat)	Yes	Unlikely	Unknown	Injury, mortality, reduction in local population
<i>Myotis macropus</i> (Southern Myotis)	No	Unlikely	Unknown	Injury, mortality, reduction in local population

8.4 Mitigating residual impacts – management measures and implementation

Table 8.6 Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)

Residual Impact	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES (when relevant)
Sedimentation and contaminated and/or nutrient rich run-off	Sediment barriers and silt fencing to prevent sediment runoff into adjacent vegetation	Install sediment barriers and erosion control during construction to prevent runoff into adjacent vegetation	Prior to the removal of vegetation	Duration of construction phase	Construction site manager	High. Low risk of failure when installed correctly	No
Changing surface water characteristics	The proposed basin includes measures to minimise impacts on surface water quality and quantity. Measures include planting of native vegetation within and along the batters as well as use of missed rocks to slow the velocity of water (Paul Scrivener Landscaping 2024)	The proposed basin has been designed to minimise impacts on surface water quality and quantity.	Design during the planning phase and construction during the construction phase	Design and Construction phase	Project designer and construction site supervisor	High. Low risk of failure when installed correctly	No
Transport of weeds and pathogens from the site to adjacent vegetation	Hygiene protocols to prevent the spread of weeds or pathogens between infected areas and uninfected areas	Vehicles should be washed down before entering and exiting the site to prevent the spread of weeds and pathogens to or from the development site and adjacent vegetation. Any weed outbreaks should be controlled during the project.	During the removal of vegetation from the subject land	Construction phase	Construction site manager	High. Low risk of failure when installed correctly	No

Residual Impact	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES (when relevant)
Inadvertent impacts on adjacent habitat or vegetation	Staff training and site briefing to communicate environmental features to be protected and measures to be implemented	All staff working on the development will undertake an environmental induction as part of their site familiarisation. Site briefings should be updated based on phase of the work. This induction will include items such as: - Site environmental procedures (vegetation management, sediment and erosion control, exclusion fencing and weeds of national significance (WoNS) and priority weeds)	Prior to the commencement and the duration of the construction phase for all new contractors	Construction phase	Project manager	High efficacy with a low risk of failure.	No
Reduced viability of adjacent habitat due to edge effects	Minimise clearance along the eastern boundary with remnant vegetation to minimise edge effects, weed incursion, light spill and filter noise.	Appropriate siting and management of associated future development APZs with retaining vegetation along the boundary between the development area and retained vegetation in the east.	The duration of the project	Design, construction and operation phase	Project manager	Moderate efficacy with a low risk of failure if management actions are undertaken	No
Fertiliser and herbicide drift, and rubbish dumping.	Restrict access and strict no-go areas within adjoining vegetation and retained vegetation within the subject site	Erection of fencing along the boundary connected vegetation in the east.	Installed during the construction phase and for perpetuity of the operational phase	Construction and operational phase	Project manager	Moderate efficacy with a moderate risk of failure.	No
Fragmentation of movement corridor	Plantings, street trees and fauna movement	Plantings, street trees and fauna movement structures	Installed during the construction	Construction and	Construction site manager	Moderate efficacy with	No

Residual Impact	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES (when relevant)
	structures are to be implemented in future planning proposal design.		phase and maintained in the operational phase	operational phase	and Project manager	a moderate risk of failure.	
Vehicle strike	Low speed limits	Erection of low-speed limit within any future planning proposal for the development area.	Installed during the construction phase and maintained in the operational phase	Construction and operational phase	Construction site manager and Project manager	Moderate efficacy with a moderate risk of failure.	No

9.0 Serious and irreversible impacts

9.1 Assessment for serious and irreversible impacts on biodiversity values

Candidate species for a Serious and Irreversible Impact (SAIL) are listed in Table 9.1. The candidate species list has been derived from threatened species predicted to have the potential to occur based on the BAM Calculator and state and national database searches. No candidate SAIL ecological communities are present within the development area. Table 9.1 also contains analysis of whether impacts on candidate species are serious and irreversible.

Table 9.1 Entities at risk of an SAIL

Common name	Scientific name	Further SAIL assessment required?	Reason for exclusion from further assessment if no further SAIL assessment is required
Regent Honeyeater	<i>Anthochaera phrygia</i>	No	The development area was not within the Important Areas Map for this species.
Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	No	Although this species was recorded within the subject land, no breeding habitat for this species was located within the development area, including: <ul style="list-style-type: none"> • No Cliffs within the subject land; and • Not within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels.
Swift Parrot	<i>Lathamus discolor</i>	No	The development area was not within the Important Areas Map for this species.
Little Bent-winged-bat	<i>Miniopterus australis</i>	No	Although this species was recorded within the subject land, no breeding habitat for this species was located within the development area, including: <ul style="list-style-type: none"> • Caves; • Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in BioNet with microhabitat code 'IC – in cave'; • observation type code 'E nest-roost' with numbers of individuals >500 or from the scientific literature
Large Bent-winged-bat	<i>Miniopterus oriana oceanensis</i>	No	Although this species was recorded within the subject land, no breeding habitat for this species was located within the development area, including: <ul style="list-style-type: none"> • Caves; • Cave, tunnel, mine, culvert or other structure known or suspected to be used

Common name	Scientific name	Further SAI assessment required?	Reason for exclusion from further assessment if no further SAI assessment is required
			<p>for breeding including species records in BioNet with microhabitat code 'IC – in cave';</p> <ul style="list-style-type: none"> observation type code 'E nest-roost' with numbers of individuals >500 or from the scientific literature
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	No	The development area was not within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or cliffines.
Eastern Cave Bat	<i>Vespadelus trouhthoni</i>	No	<p>None of the following were consistent with the subject land:</p> <ul style="list-style-type: none"> Caves; and Within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, crevices or boulder piles, or within two kilometres of old mines, tunnels, old buildings or sheds
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	No	No appropriate breeding habitat was present in the subject land.
Eastern Coastal Free-tailed Ba	<i>Micronomus norfolkensis</i>	No	No appropriate breeding habitat was present in the subject land.
Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	No	No appropriate breeding habitat was present in the subject land.

9.1.1 Additional impact assessment provisions for threatened species at risk of an SAI

Falsistrellus tasmaniensis (Eastern False Pipistrelle), *Miniopterus australis* (Little Bent-winged Bat) and *Miniopterus orianae oceanensis* (Large Bent-winged Bat) were recorded calling within the subject land however no breeding habitat was located within the subject land. One old shed was present within the subject land however it was not found to provide appropriate breeding habitat for any microbat species. Plates 9.1 and 9.2 show the shed which is starting to lose its roof.

No threatened matter consistent with a SAI candidate species identified as likely to occur or to contain significant habitat within the subject land is likely to be significantly impacted by the proposed development.



Plate 9.1 Old shed within study area



Plate 9.2 Old shed within study area

10.0 Impact summary

10.1 Determine an offset requirement for impacts

10.1.1 Impacts on native vegetation and TECs or ECs (ecosystem credits)

Table 10.1 identifies impacts that require an offset (as per BAM Subsection 9.2.1(1.)). An offset is not required for impacts where the vegetation integrity score is below those as per BAM Subsection 9.2.1(3.) for impacts on native vegetation. This is not applicable to the Proposal.

Table 10.1 Impacts that require an offset – ecosystem credits

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
PCT 3444_Moderate	Lower Hunter Spotted Gum-Ironbark Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	0.69	41.5	Removal: 0 APZ: 3.2	-41.3	High Sensitivity to Gain	14
PCT 3444_Derived Grassland	Lower Hunter Spotted Gum-Ironbark Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	2.09	17.9	Removal: 0 APZ: 6.5	-17.1	High Sensitivity to Gain	18
PCT 3328_Moderate	Lower Hunter Red Gum-Paperbark Riverflat Forest	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	0.18	34.4	Removal: 0 APZ: 4.9	-34.1	High Sensitivity to Gain	3
PCT 3328_Derived Grassland	Lower Hunter Red Gum-Paperbark Riverflat Forest	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	0.30	24.6	Removal: 0 APZ: 9.7	-22.3	High Sensitivity to Gain	3
PCT 3975_Fair	Southern Lower Floodplain Freshwater Wetland	N/A	0.19	54.1	0	-54.1	High Sensitivity to Gain	5

Vegetation zone	PCT name	TEC	Impact area (ha)	Current VI score	Future VI score	Change in VI score	Biodiversity risk weighting	Number of ecosystem credits required
PCT 3446_Carex Dominant	Lower North Foothills Ironbark-Box-Gum Grassy Forest	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.50	5.9	Removal: 0 APZ: 7.7	-4.2	High Sensitivity to Gain	0
Total								43

10.1.2 Impacts on threatened species and their habitat (species credits)

Table 10.2 identifies impacts on threatened species (species credits) that require an offset (as per BAM Subsection 9.2.2(2.)).

Table 10.2 Impacts that require an offset – species credits

Vegetation Zone	Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	Number of species credits required
PCT 3444 Moderate	Southern Myotis	<i>Myotis macropus</i>	V	Not listed	0.31ha	2	6
PCT 3444 Derived Grassland	Southern Myotis	<i>Myotis macropus</i>	V	Not listed	1.86ha	2	16
PCT 3328 Moderate	Southern Myotis	<i>Myotis macropus</i>	V	Not listed	0.18ha	2	3
PCT 3328 Derived	Southern Myotis	<i>Myotis macropus</i>	V	Not listed	0.30ha	2	3
PCT 3975 Fair	Southern Myotis	<i>Myotis macropus</i>	V	Not listed	0.19ha	2	5
PCT 3446 Carex Dominant	Southern Myotis	<i>Myotis macropus</i>	V	Not listed	0.50ha	2	1
						Subtotal	33
PCT 3444 Moderate	Squirrel Glider	<i>Petaurus norfolcensis</i>	V	Not listed	0.69ha	2	14
PCT 3328 Moderate	Squirrel Glider	<i>Petaurus norfolcensis</i>	V	Not listed	0.18ha	2	3

Vegetation Zone	Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	Number of species credits required
						Subtotal	17
PCT 3444 Moderate	Pterostylis chaetophora (Flora)	<i>Pterostylis chaetophora</i>	V	Not listed	0.69ha	2	14
PCT 3328 Moderate	Pterostylis chaetophora (Flora)	<i>Pterostylis chaetophora</i>	V	Not listed	0.18ha	2	3
						Subtotal	17
						Total	68

10.1.3 Indirect and prescribed impacts

No indirect and prescribed impacts remain after measures to avoid, minimise and mitigate have been applied.

10.1.4 Serious and Irreversible Impacts (SII)

No threatened matter consistent with a SII candidate species identified as likely to occur or to contain significant habitat within the study area is likely to be impacted by the proposal.

10.1.5 Areas not requiring assessment

No areas not requiring assessment were present within the subject land.

10.1.6 Impact on biodiversity values

No mapped Biodiversity Values were present within the subject land.

11.0 Biodiversity credit report

Table 11.1 contains offset ecosystem credit details and Table 11.2 contains offset species credit details. Also see Appendix H Credit reports.

11.1 Ecosystem credits

Table 11.1 Ecosystem credit class and matching credit profile

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
14	3444-Lower Hunter Spotted Gum-Ironbark Forest	Hunter Macleay Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrub/grass sub formation)	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	Yes	Hunter
18	3444-Lower Hunter Spotted Gum-Ironbark Forest	Hunter Macleay Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrub/grass sub formation)	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	No	Hunter
6	3328-Lower Hunter Red Gum-Paperbark Riverflat Forest	Coastal Valley Grassy Woodlands	Grassy Woodlands	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions This includes PCT's: 1603, 1605, 1691, 1692, 3328, 3446, 3634	No	Hunter

Ecosystem credit	Attributes shared with matching credits						
	PCT name	PCT vegetation class	PCT vegetation formation	Associated TEC or EC	Offset trading group (BAM Section 10.2, Tables 4 & 5)	Hollow bearing trees present?	IBRA subregion (in which proposal is located)
5	3975-Southern Lower Floodplain Freshwater Wetland	Coastal Freshwater Lagoons	Freshwater Wetlands	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 1738, 3958, 3959, 3962, 3964, 3965, 3967, 3971, 3973, 3975, 3976	No	Hunter
0	3446-Lower North Foothills Ironbark-Box-Gum Grassy Forest	Hunter Macleay Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrub/grass sub formation)	Not a TEC	Hunter-Macleay Dry Sclerophyll Forests This includes PCT's: 3431, 3442, 3446	No	Hunter

11.2 Species credits

Table 11.2 Species credit class and matching credit profile

Common name	Scientific name	BC Act status	EPBC Act status	Loss of habitat (ha) or individuals	Biodiversity risk weighting	Number of species credits required
Southern Myotis	<i>Myotis macropus</i>	V	Not listed	3.34ha	2	34
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	Not listed	0.87ha	2	17
Pterostylis chaetophora	<i>Pterostylis chaetophora</i>	V	Not listed	0.87ha	2	17
Total						68

12.0 Considerations Under State Environmental Planning Policy (Biodiversity and Conservation) 2021

12.1 Chapter 4 Koala Habitat Protection 2021

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

Within the Maitland City Council LGA Chapter 4 applies to land that is not zoned RU1, RU2 or RU3 and has an area of more than one hectare or an area which has together with any adjoining land in the same ownership an area of more than one hectare, whether or not the development application applies to the whole, or only part of the land. The study area is larger than 1ha therefore Chapter 4 is addressed further below.

With no approved Koala Plan of Management for this LGA, Chapter 4 is addressed by considering Part 4.9 *Development assessment process — no approved koala plan of management for land*.

For the purposes of Part 4.9 of the SEPP (Biodiversity Conservation) 2021, the following factors have been taken into account in deciding whether there is likely to be a significant impact on koalas or koala habitat:

4.9.5 ... *the council may grant development consent if the applicant provides to the council—*

- (a) information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application-*
 - (i) does not include any trees belonging to the koala use tree species listed in Schedule 3 for the relevant koala management area, or*

Most trees within the mapped native vegetation are considered koala use trees species in the Central Coast Koala Management Area under Schedule 1 of SEPP (Biodiversity Conservation) 2021. This includes *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia maculata* (Spotted Gum), *Eucalyptus siderophloia* (Grey Ironbark), *Eucalyptus crebra* (Narrow-leaved Ironbark) and *Eucalyptus fibrosa* (Broad-leaved Red Ironbark). Most of the trees proposed to be removed as part of the subdivision are koala use trees.

- (ii) is not core koala habitat, or*

Core Koala Habitat is defined in Chapter 4 as

“ (a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or

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

No koalas were identified during site surveys. According to the BioNet Atlas database search (DPE, 2024a), there has been many koala sightings recorded with a 10km radius of the site. Two koala records with accuracies less than 1000m that were recorded within the past 18 years were present within 2.5km of the subject land. These records meet the criteria for valid koala record on site as outlined in the Koala SEPP 2021 Factsheet (DPIE 2021).

Highly suitable habitat is defined under this SEPP as *“Highly suitable habitat is where 15% or greater of the total number of trees within any Plant Community Type (PCT) are the regionally relevant species of those listed in Schedule 2 of the SEPP”* Koala SEPP 2021 Factsheet (DPIE 2021). Almost all tree species within the site are considered koala use trees species in the Central Coast Koala Management Area under Schedule 1 of SEPP (Biodiversity Conservation) 2021. Habitat within the subject land is therefore considered highly suitable koala habitat.

(b) information the council is satisfied demonstrates that the land subject of the development application-

(i) does not include any trees with a diameter at breast height over bark of more than 10 centimetres, or

All trees surveyed within the site had a BDH above 10cm (see Table I1).

(ii) includes only horticultural or agricultural plantations.

No horticultural or agricultural plantations were present on site.

Taking all elements into consideration including the presence of two valid koala records and highly suitable koala habitat this proposal may require a Koala Assessment Report. Further surveys were undertaken for Koala as a species credit species including three Koala Spot Assessment Technique surveys. No evidence of koalas was found during any surveys conducted.

13.0 NSW Biosecurity Act 2015

Five priority weed species listed under the Biosecurity Act 2015 were identified on site and are listed below in Table 14.1. The site lies within the Hunter Local Land Services Region.

Table 13.1 Priority Weed species found within the subject land.

WEED Species	Legal Requirements	ADDITIONAL SIGNIFICANCE
<i>Lantana camara</i> (Lantana)	General Biosecurity Duty Prohibition on dealings	T, N
<i>Senecio madagascariensis</i> (Fireweed)	General Biosecurity Duty Prohibition on dealings	N
<i>Opuntia stricta</i> var. <i>stricta</i> (Prickly Pear)	General Biosecurity Duty Prohibition on dealings	N
<i>Olea europaea</i> subsp. <i>cuspidata</i> (African Olive)	General Biosecurity Duty Prohibition on dealings	T
<i>Bryophyllum delagoense</i> (Mother-of-millions)	General Biosecurity Duty Prohibition on dealings	

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

N – Weed of National Significance.

*Priorities under the Biosecurity Act 2015

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

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

It is recommended that weed control be included within any future development proposal.

14.0 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where “Matters of National Environmental Significance” (MNES) may be affected. Under the Act, any action which “has, will have, or is likely to have a significant impact on a matter of MNES” is defined as a “controlled action”, and requires approval from the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW), which is responsible for administering the EPBC Act. The process includes conducting a Significant Impact Criteria assessment for listed threatened species and ecological communities that represent a matter of MNES that will be impacted as a result of the proposed action. Guidelines that outline of the significant impact criteria have been developed by the Commonwealth and help decide whether or not a referral to the Minister is required. The likelihood of occurrence for EPBC listed threatened species is shown in Appendix C.

The assessment in Appendix C has been undertaken in accordance with significant impact guidelines 1.1 under the EPBC Act (DoEE, 2013) to address the significant impact criteria for following EPBC listed threatened species;

- *Pteropus poliocephalus* (Grey Headed Flying Fox) - Endangered

The significant impact criteria found that there will not likely to be a significant impact for Grey Headed Flying Fox.

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Appendix A: BDAR requirements compliance

Table A 1 Assessment of compliance with BDAR minimum information requirements

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
Introduction	Chapters 2 and 3	Information	
		Introduction to the biodiversity assessment including:	–
		☒ brief description of the proposal	1.1.1
		☒ identification of subject land boundary, including:	
		☒ operational footprint	1.1.3
		☒ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure	
		☒ general description of the subject land	
		☒ sources of information used in the assessment, including reports and spatial data	Table 1.2
		☒ identification and justification for entering the BOS	1.2.2 Table 1.1
		Maps and tables	
		☒ Map of the subject land boundary showing the final proposal footprint, including the construction footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	Figure 1.3
Landscape	Sections 3.1 and 3.2, Appendix E	Information	
		Identification of site context components and landscape features, including:	–
		☒ general description of subject land topographic and hydrological setting, geology and soils	3.2.7
		☒ per cent native vegetation cover in the assessment area (as described in BAM Section 3.2)	3.3

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	3.2.1
		<input checked="" type="checkbox"/> rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E)	
		<input checked="" type="checkbox"/> wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.))	
		<input checked="" type="checkbox"/> connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.))	3.2.3
		<input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing proposals, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.))	3.2.4
		<input checked="" type="checkbox"/> areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.))	3.2.5
		<input checked="" type="checkbox"/> NSW (Mitchell) landscape on which the subject land occurs	3.2.6
		<input checked="" type="checkbox"/> details of field reconnaissance undertaken to confirm the extent and condition of landscape features and native vegetation cover (as described in Operational Manual Stage 1 Section 2.4)	2.1
		Maps and tables	
		<input checked="" type="checkbox"/> Site Map	Figure 1.2
		<input checked="" type="checkbox"/> Property boundary	
		<input checked="" type="checkbox"/> Boundary of subject land	
		<input checked="" type="checkbox"/> Cadastre of subject land (including labelling of Lot and DP or section plan if relevant)	
		<input type="checkbox"/> Landscape features identified in BAM Subsection 3.1.3	
		<input checked="" type="checkbox"/> Location Map	
		<input checked="" type="checkbox"/> Digital aerial photography at 1:1,000 scale or finer	
		<input checked="" type="checkbox"/> Boundary of subject land	
		<input checked="" type="checkbox"/> Assessment area (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development)	
		<input type="checkbox"/> Landscape features identified in BAM Subsection 3.1.3	
		<input type="checkbox"/> Additional detail (e.g. local government area boundaries) relevant at this scale	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location Map include:	–
		<input type="checkbox"/> IBRA bioregions and subregions <input checked="" type="checkbox"/> rivers, streams and estuaries <input checked="" type="checkbox"/> wetlands and important wetlands <input checked="" type="checkbox"/> connectivity of different areas of habitat <input type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features <input type="checkbox"/> areas of outstanding biodiversity value occurring on the subject land and assessment area <input type="checkbox"/> any additional landscape features identified in any SEARs for the proposal <input checked="" type="checkbox"/> NSW (Mitchell) landscape on which the subject land occurs	Figure 3.1 Figure 3.2
		Data	
		<input type="checkbox"/> All report maps as separate jpeg files	–
		Individual digital shape files of:	–
		<input type="checkbox"/> subject land boundary	–
		<input type="checkbox"/> assessment area (i.e. subject land and 1500 m buffer area) boundary	–
		<input type="checkbox"/> cadastral boundary of subject land	–
		<input type="checkbox"/> areas of native vegetation cover	–
		<input type="checkbox"/> landscape features	–
Native vegetation	Chapter 4, Appendix A and Appendix H	Information	
		<input checked="" type="checkbox"/> Identify native vegetation extent within the subject land, including cleared areas and evidence to	4.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	Figure 3.
		<input checked="" type="checkbox"/> Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2)	4.1
		<input checked="" type="checkbox"/> Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1)	Figure
		<input checked="" type="checkbox"/> Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	2.3.2
		<input type="checkbox"/> Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A)	
		For each PCT within the subject land, describe:	–
		<input checked="" type="checkbox"/> PCT name and ID	4.2.1
		<input checked="" type="checkbox"/> vegetation class	4.2.1.1
		<input checked="" type="checkbox"/> extent (ha) within subject land	4.2.1.1
		<input checked="" type="checkbox"/> evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	
		<input checked="" type="checkbox"/> plant species relied upon for identification of the PCT and relative abundance of each species	
		<input checked="" type="checkbox"/> if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	
		<input checked="" type="checkbox"/> estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	4.2.1.1
		Describe the vegetation integrity assessment of the subject land, including:	–
		<input checked="" type="checkbox"/> identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> description of vegetation zones within the subject land (as described in Operational Manual Stage 1 Table 2 and Subsection 3.3.2)	Table 4.
		<input checked="" type="checkbox"/> area (ha) of each vegetation zone	Table 4.
		<input checked="" type="checkbox"/> assessment of patch size (as described in BAM Subsection 4.3.2)	Table 4.
		<input checked="" type="checkbox"/> survey effort (i.e., number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	Table 4.
		<input type="checkbox"/> use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	
		Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A):	–
		<input type="checkbox"/> identify the PCT or vegetation class for which local benchmark data will be applied	
		<input type="checkbox"/> identify published sources of local benchmark data (if benchmarks obtained from published sources)	
		<input type="checkbox"/> describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	
		<input type="checkbox"/> provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	
		<input type="checkbox"/> provide written confirmation from the decision-maker that they support the use of local benchmark data	
		Maps and tables	
		<input checked="" type="checkbox"/> Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of all areas of native vegetation including areas that are ground cover only, cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2)	Figure 3.
		<input checked="" type="checkbox"/> Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	Figure 4.
		<input checked="" type="checkbox"/> Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	
		<input checked="" type="checkbox"/> Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure D 1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	Table 4.6
		<input checked="" type="checkbox"/> Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		<input checked="" type="checkbox"/> composition condition score	Table 4.
		<input checked="" type="checkbox"/> structure condition score	
		<input checked="" type="checkbox"/> function condition score	
		<input checked="" type="checkbox"/> presence of hollow bearing trees	
		Data	
		<input type="checkbox"/> All report maps as separate jpeg files	–
		<input type="checkbox"/> Plot field data (MS Excel format)	
		<input type="checkbox"/> Plot field datasheets	Appendix D
		Digital shape files of:	–
		<input type="checkbox"/> PCT boundaries within subject land	–
		<input type="checkbox"/> TEC boundaries within subject land	–
		<input type="checkbox"/> vegetation zone boundaries within subject land	–
		<input type="checkbox"/> floristic vegetation survey and vegetation integrity plot locations	–
Threatened species	Chapter 5	Information	
		Identify ecosystem credit species likely to occur on the subject land, including:	–
		<input checked="" type="checkbox"/> list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	Table 5.1
		<input checked="" type="checkbox"/> justification and supporting evidence for exclusion of any ecosystem credit species based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and	Table 5.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		5.2.2)	
		<input checked="" type="checkbox"/> justification for addition of any ecosystem credit species to the list	Table 5.1
		Identify species credit species likely to occur on the subject land, including:	–
		<input checked="" type="checkbox"/> list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	Table 5.2
			Table 5.3
		<input checked="" type="checkbox"/> justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2)	Table 5.2
			Table 5.3
		<input checked="" type="checkbox"/> justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2)	Table 5.2
			Table 5.3
		<input checked="" type="checkbox"/> justification for addition of any species credit species to the list	Table 5.2
			Table 5.3
		From the list of candidate species credit species, identify:	–
		<input checked="" type="checkbox"/> species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2. a.))	Table 5.4
		<input checked="" type="checkbox"/> species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.))	Table 5.5
		<input checked="" type="checkbox"/> species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.))	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> species for which an expert report is to be used to determine species presence (BAM Subsection 5.2.4(2.c.))	
		Present the outcomes of species credit species assessments from:	–
		<input checked="" type="checkbox"/> threatened species survey (as described in BAM Section 5.2.4)	Table 5.6 Table 5.7
		<input type="checkbox"/> expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Subsection 5.2.4, Section 5.3, Box 3)	
		Where survey has been undertaken include detailed information on:	–
		<input checked="" type="checkbox"/> survey method and effort (as described in BAM Section 5.3)	Table 5.6 Table 5.7
		<input checked="" type="checkbox"/> justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the department's taxa-specific survey guides or where no relevant guideline has been published	2.3.3.1 2.4.3
		<input checked="" type="checkbox"/> timing of survey in relation to requirements in the TBDC or the department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys	Table 5.6 Table 5.7
		<input type="checkbox"/> survey personnel and relevant experience	Declarations
		<input type="checkbox"/> describe any limitations to surveys and how these were addressed/overcome	
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	–
		<input type="checkbox"/> justification of the use of an expert report	
		<input type="checkbox"/> identify the expert, provide evidence of their expert credentials and departmental approval of expert status	
		<input type="checkbox"/> all requirements of Box 3 have been addressed in the expert report	
		Where use of local data is proposed (BAM Subsection 1.4.2):	–
		<input type="checkbox"/> identify relevant species	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input type="checkbox"/> identify data to be amended <input type="checkbox"/> identify source of information for local data, e.g., published literature, additional survey data, etc. <input type="checkbox"/> justify use of local data in preference to VIS Classification or TBDC data	
		<input type="checkbox"/> provide written confirmation from the decision-maker that they support the use of local data	
		Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that:	–
		<input checked="" type="checkbox"/> the unit of measure for each species is documented	
		for species assessed by area:	–
		<input checked="" type="checkbox"/> the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	Figure 5.1 Figure 5.2
		<input type="checkbox"/> a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	
		for species assessed by counts of individuals:	–
		<input checked="" type="checkbox"/> the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	
		<input type="checkbox"/> the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	
		<input type="checkbox"/> the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land	
		<input checked="" type="checkbox"/> Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	Table 10.2
		Maps and tables	
		<input checked="" type="checkbox"/> Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	Table 5.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> the ecosystem credit species removed from the list	Table 5.1
		<input checked="" type="checkbox"/> the sensitivity to gain class of each species	Table 5.1
		<input checked="" type="checkbox"/> Table detailing species credit species in accordance with BAM Section 5.2 and identifying:	Table 5.2 Table 5.3 Table 5.6 Table 5.7
		<input checked="" type="checkbox"/> the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or microhabitat features are not present	Table 5.2 Table 5.3
		<input checked="" type="checkbox"/> the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	Table 5.6 Table 5.7
		<input type="checkbox"/> Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4)	Table 5.6 Table 5.7
		<input type="checkbox"/> Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5)	Figure 5.1 Figure 5.2
		Data	
		<input type="checkbox"/> Digital shape files of suitable habitat identified for survey for each candidate species credit species	–
		<input type="checkbox"/> Survey locations including GPS coordinates of any plots, transects, grids	
		<input type="checkbox"/> Digital shape files of each species polygon including GPS coordinates of located individuals	–
		<input type="checkbox"/> Species polygon map in jpeg format	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input type="checkbox"/> Expert reports and any supporting data used to support conclusions of the expert report	
		<input type="checkbox"/> Field datasheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	
Prescribed impacts	Chapter 6	Information	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		<input checked="" type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1)	Table 6.1
		<input checked="" type="checkbox"/> occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2)	
		<input checked="" type="checkbox"/> corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3)	
		<input checked="" type="checkbox"/> waterbodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	
		<input checked="" type="checkbox"/> where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6)	Table 6.1
		<input checked="" type="checkbox"/> Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts	Table 6.1
		<input checked="" type="checkbox"/> Describe the importance of habitat features to the species including, where relevant, impacts on life cycle or movement patterns (e.g., Subsection 6.1.3)	Table 6.1
		Maps and tables	
		<input type="checkbox"/> Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	
		<input type="checkbox"/> Map showing location of potential vehicle strike locations	
		Data	
		<input type="checkbox"/> Digital shape files of prescribed impact feature locations	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input type="checkbox"/> Prescribed impact features map in jpeg format	–
Avoid and minimise impacts	Chapter 7	Information	
		Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative:	–
		<input checked="" type="checkbox"/> modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	Figure 7.1 Table 7.1
		<input checked="" type="checkbox"/> routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	Figure 7.1 Table 7.1
		<input checked="" type="checkbox"/> alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	7.1.1 7.2.1
		<input checked="" type="checkbox"/> alternative sites within a property on which the proposal is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site	7.1.2 7.2.2
		<input checked="" type="checkbox"/> Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through proposal design (as described in BAM Sections 7.1 and 7.2)	Figure 7.1 Table 7.1
		<input checked="" type="checkbox"/> Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Subsection 7.2.1(3.))	Figure 7.1 Table 7.1
		<input type="checkbox"/> Detail measures or options considered but not implemented because they are not feasible and/or practical (e.g., due to site constraints)	
		Maps and tables	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility	Figure 7.1 Table 7.1
		<input type="checkbox"/> Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation	
		<input type="checkbox"/> Maps demonstrating indirect impact zones where applicable	
		Data	
		Digital shape files of:	–
		<input type="checkbox"/> alternative and final proposal footprint	–
		<input type="checkbox"/> direct and indirect impact zones	–
		<input type="checkbox"/> Maps in jpeg format	–
Assessment of impacts	Chapter 8, Sections 8.1 and 8.2	Information	
		<input checked="" type="checkbox"/> Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1)	Table 8.1 Table 8.2
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	–
		<input checked="" type="checkbox"/> description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	Table 8.3
		<input checked="" type="checkbox"/> documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	Table 8.1 Table 8.2
		<input checked="" type="checkbox"/> reporting any limitations or assumptions, etc. made during the assessment	Table 8.3
		<input checked="" type="checkbox"/> identification of the threatened entities and their habitat likely to be affected	Table 8.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
			Table 8.2
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	–
		assessment of the nature, extent frequency, duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	–
		<input type="checkbox"/> karst, caves, crevices, cliffs, rocks and other features of geological significance	
		<input type="checkbox"/> human-made structures	
		<input checked="" type="checkbox"/> non-native vegetation	8.3.1
		<input checked="" type="checkbox"/> connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	Table 8.3
		<input type="checkbox"/> movement of threatened species that maintains their life cycle	
		<input checked="" type="checkbox"/> water quality, waterbodies and hydrological processes that sustain threatened species and threatened ecological communities	8.3.3
		<input checked="" type="checkbox"/> assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC	8.3.4
		<input checked="" type="checkbox"/> evaluate the consequences of prescribed impacts	Table 8.3
		<input type="checkbox"/> describe impacts that are uncertain	
		<input type="checkbox"/> document limitations to data, assumptions and predictions	
		Maps and tables	
		<input type="checkbox"/> Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 8.2
		Data	
		N/A	–
Mitigation and management of impacts	Chapter 8, Sections 8.4 and 8.5	Information	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	–
		<input checked="" type="checkbox"/> techniques, timing, frequency and responsibility	Table 8.3
		<input type="checkbox"/> identify measures for which there is risk of failure	Table 8.6
		<input checked="" type="checkbox"/> evaluate the risk and consequence of any residual impacts	
		<input type="checkbox"/> document any adaptive management strategy proposed	
		Identification of measures for mitigating impacts related to:	–
		<input checked="" type="checkbox"/> displacement of resident fauna (as described in BAM Subsection 8.4.1(2.))	Table 8.6
		<input checked="" type="checkbox"/> indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.))	
		<input checked="" type="checkbox"/> mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2)	
		<input type="checkbox"/> Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)	
		Maps and tables	
		<input checked="" type="checkbox"/> Table of measures to be implemented before, during and after construction to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility	Table 8.6
		Data	
		N/A	–
Impact summary	Chapter 9	Information	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including:	–
		<input type="checkbox"/> addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land	
		<input type="checkbox"/> for each TEC, report the extent of the TEC in NSW	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input type="checkbox"/> addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAIL present on the subject land	
		<input type="checkbox"/> for each threatened species, report the population size in NSW	
		<input type="checkbox"/> documenting assumptions made and/or limitations to information	
		<input type="checkbox"/> documenting all sources of data, information, references used or consulted	
		<input type="checkbox"/> clearly justifying why any criteria could not be addressed	
		<input type="checkbox"/> Identification of impacts requiring offset in accordance with BAM Section 9.2	
		<input type="checkbox"/> Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.)	
		<input type="checkbox"/> Identification of areas not requiring assessment in accordance with BAM Section 9.3	
		Maps and tables	
		<input type="checkbox"/> Map showing the extent of TECs at risk of an SAIL within the subject land	
		<input type="checkbox"/> Map showing location of threatened species at risk of an SAIL within the subject land	
		Map showing location of:	–
		<input type="checkbox"/> impacts requiring offset	
		<input type="checkbox"/> impacts not requiring offset	
		<input type="checkbox"/> areas not requiring assessment	
		Data	
		Digital shape files of:	–
		<input type="checkbox"/> extent of TECs at risk of an SAIL within the subject land	–
		<input type="checkbox"/> location of threatened species at risk of an SAIL within the subject land	–
		<input type="checkbox"/> boundary of impacts requiring offset	–
		<input type="checkbox"/> boundary of impacts not requiring offset	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input type="checkbox"/> boundary of areas not requiring assessment	–
		<input type="checkbox"/> Maps in jpeg format	–
Impact summary	Chapter 10	Information	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including:	–
		<input checked="" type="checkbox"/> future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H)	Table 10.1
		<input checked="" type="checkbox"/> change in vegetation integrity score (BAM Subsection 8.1.1)	
		<input checked="" type="checkbox"/> number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 10.1.2)	
		<input checked="" type="checkbox"/> biodiversity risk weighting for each	Table 10.1 Table 10.2
		<input checked="" type="checkbox"/> number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)	Table 10.2
		Maps and tables	
		<input checked="" type="checkbox"/> Table of PCTs requiring offset and the number of ecosystem credits required	Table 10.1
		<input checked="" type="checkbox"/> Table of threatened species requiring offset and the number of species credits required	Table 10.2
		Data	
		<input type="checkbox"/> Submitted proposal in the BAM Calculator	–
Biodiversity credit report	Chapter 10	Information	
		<input checked="" type="checkbox"/> Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2)	Table 11.1 Table 11.2
		<input type="checkbox"/> BAM credit report in pdf format	<Appendix H>

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Maps and tables	
		<input type="checkbox"/> Table of credit class and matching credit profile	Table 11.1 Table 11.2
		Data	
		<input type="checkbox"/> BAM credit report in pdf format	<Appendix E>

Appendix B: Biodiversity Values Map and Threshold tool report



Department of Planning and Environment

Biodiversity Values Map and Threshold Report

This report is generated using the Biodiversity Values Map and Threshold (BMAT) tool. The BMAT tool is used by proponents to supply evidence to your local council to determine whether or not a Biodiversity Development Assessment Report (BDAR) is required under [the Biodiversity Conservation Regulation 2017 \(Cl. 7.2 & 7.3\)](#).

The report provides results for the proposed development footprint area identified by the user and displayed within the blue boundary on the map.

There are two pathways for determining whether a BDAR is required for the proposed development:

1. Is there Biodiversity Values Mapping?
2. Is the 'clearing of native vegetation area threshold' exceeded?

Biodiversity Values Map and Threshold Report		
Date of Report Generation		18/07/2024 7:35 AM
1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)		
1.1	Does the development Footprint intersect with BV mapping?	no
1.2	Was <u>ALL</u> BV Mapping within the development footprinted added in the last 90 days? (dark purple mapping only, no light purple mapping present)	no
1.3	Date of expiry of dark purple 90 day mapping	N/A
1.4	Is the Biodiversity Values Map threshold exceeded?	no
2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)		
2.1	Size of the development or clearing footprint	60,410.0 sqm
2.2	Native Vegetation Area Clearing Estimate (NVACE) (within development/clearing footprint)	6,261.6 sqm
2.3	Method for determining Minimum Lot Size	LEP
2.4	Minimum Lot Size (10,000sqm = 1ha)	450 sqm
2.5	Area Clearing Threshold (10,000sqm = 1ha)	2,500 sqm
2.6	Does the estimate exceed the Area Clearing Threshold? (NVACE results are an estimate and can be reviewed using the Guidance)	yes
REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area? (Your local council will determine if a BDAR is required)		yes



Department of Planning and Environment

What do I do with this report?

- If the result above indicates the BOS Threshold has been exceeded, your local council **may require a Biodiversity Development Assessment Report** with your development application. Seek further advice from Council. An accredited assessor can apply the Biodiversity Assessment Method and prepare a BDAR for you. For a list of accredited assessors go to: <https://customer.lmbc.nsw.gov.au/assessment/AccreditedAssessor>.
- If the result above indicates the BOS Threshold has not been exceeded, you may not require a Biodiversity Development Assessment Report. This BMAT report can be provided to Council to support your development application. Council can advise how the area clearing threshold results should be considered. Council will review these results and make a determination if a BDAR is required. Council may ask you to review the area clearing threshold results. You may also be required to assess whether the development is "likely to significantly affect threatened species" as determined under the test in Section 7.3 of the *Biodiversity Conservation Act 2016*.
- If a BDAR is not required by Council, you may still require a permit to clear vegetation from your local council.
- If **all** Biodiversity Values mapping within your development footprint was less than 90 days old, i.e. areas are displayed as dark purple on the BV map, a BDAR may not be required if your Development Application is submitted within that 90 day period. Any BV mapping less than 90 days old on this report will expire on the date provided in Line item 1.3 above.

For more detailed advice about actions required, refer to the **Interpreting the evaluation report** section of the [Biodiversity Values Map Threshold Tool User Guide](#).

Review Options:

- If you believe the Biodiversity Values mapping is incorrect please refer to our [BV Map Review webpage](#) for further information.
- If you or Council disagree with the area clearing threshold estimate results from the NVACE in Line Item 2.6 above (i.e. area of Native Vegetation within the Development footprint proposed to be cleared), review the results using the [Guide for reviewing area clearing threshold results from the BMAT Tool](#).

Acknowledgement

I, as the applicant for this development, submit that I have correctly depicted the area that will be impacted or likely to be impacted as a result of the proposed development.

Signature: _____

(Typing your name in the signature field will be considered as your signature for the purposes of this form)

Date: _____

18/07/2024 07:35 AM



Department of Planning and Environment

Biodiversity Values Map and Threshold Tool

The Biodiversity Values (BV) Map and Threshold Tool identifies land with high biodiversity value, particularly sensitive to impacts from development and clearing.

The BV map forms part of the Biodiversity Offsets Scheme threshold, which is one of the factors for determining whether the Scheme applies to a clearing or development proposal. You have used the Threshold Tool in the map viewer to generate this BV Threshold Report for your nominated area. This report calculates results for your proposed development footprint and indicates whether Council may require you to engage an accredited assessor to prepare a Biodiversity Development Assessment Report (BDAR) for your development.

This report may be used as evidence for development applications submitted to councils. You may also use this report when considering native vegetation clearing under the State Environmental Planning Policy (Biodiversity and Conservation) 2021 - Chapter 2 vegetation in non-rural areas.

What's new? For more information about the latest updates to the Biodiversity Values Map and Threshold Tool go to the updates section on the [Biodiversity Values Map webpage](#).

Map Review: Landholders can request a review of the BV Map where they consider there is an error in the mapping on their property. For more information about the map review process and an application form for a review go to the [Biodiversity Values Map Review webpage](#).

If you need help using this map tool see our [Biodiversity Values Map and Threshold Tool User Guide](#) or contact the Map Review Team at map.review@environment.nsw.gov.au or on 1800 001 490.



Appendix C: Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance

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 proposed development does not affect any World Heritage properties.

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

The proposed site is within proximity to the Hunter Estuary Wetlands. The proposal is unlikely to have any impact on this Ramsar site.

- listed threatened species and communities;

Threatened Communities

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

- Hunter Valley Weeping Myall (*Acacia pendula*) Woodland
- River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria
- 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
- Central Hunter Valley eucalypt forest and woodland
- Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions
- Lowland Rainforest of Subtropical Australia
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland

Plant Community Type (PCT) 3328 - Lower Hunter Red Gum-Paperbark Riverflat Forest present within the subject land was found to be similar with that of River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria. According to the Conservation Advice

for River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria (DAWE, 2020) the remnant area meets the Key diagnostic characteristics, however as the remnant including the area of surrounding regeneration is under 0.5ha (0.48ha) this area is unlikely to be included this threatened ecological community.

No other nationally threatened ecological communities were considered to be present within the subject land.

Threatened Species

Sixty-six 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:

<i>Numenius madagascariensis</i>	Eastern Curlew
<i>Lathamus discolor</i>	Swift Parrot
<i>Anthochaera phrygia</i>	Regent Honeyeater
<i>Calidris ferruginea</i>	Curlew Sandpiper
<i>Limosa limosa</i>	Black-tailed Godwit
<i>Rostratula australis</i>	Australian Painted Snipe
<i>Tringa nebularia</i>	Common Greenshank
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo
<i>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin
<i>Erythrorchis radiatus</i>	Red Goshawk
<i>Limosa lapponica baueri</i>	Nunivak Bar-tailed Godwit
<i>Charadrius mongolus</i>	Lesser Sand Plover
<i>Botaurus poiciloptilus</i>	Australasian Bittern
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (south-eastern)
<i>Xenus cinereus</i>	Terek Sandpiper
<i>Pycnoptilus floccosus</i>	Pilotbird
<i>Falco hypoleucos</i>	Grey Falcon
<i>Stagonopleura guttata</i>	Diamond Firetail
<i>Hirundapus caudacutus</i>	White-throated Needletail
<i>Grantiella picta</i>	Painted Honeyeater
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper
<i>Charadrius leschenaultii</i>	Greater Sand Plover
<i>Arenaria interpres</i>	Ruddy Turnstone
<i>Pluvialis squatarola</i>	Grey Plover
<i>Calidris tenuirostris</i>	Great Knot
<i>Neophema chrysostoma</i>	Blue-winged Parrot
<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo
<i>Gallinago hardwickii</i>	Latham's Snipe
<i>Mixophyes balbus</i>	Stuttering Frog
<i>Mixophyes iteratus</i>	Giant Barred Frog

<i>Litoria aurea</i>	Green and Golden Bell Frog
<i>Phascolarctos cinereus</i>	Koala
<i>Dasyurus maculatus maculatus</i>	Spot-tailed Quoll
<i>Petauroides volans</i>	Greater Glider (southern and central)
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat
<i>Petaurus australis australis</i>	Yellow-bellied Glider (south-eastern)
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo (northern)
<i>Notamacropus parma</i>	Parma Wallaby
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox
<i>Pseudomys novaehollandiae</i>	New Holland Mouse
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby
<i>Rhodomys psidioides</i>	Native Guava
<i>Euphrasia arguta</i>	
<i>Rhodamnia rubescens</i>	Scrub Turpentine
<i>Prasophyllum sp. Wybong (C.Phelps ORG 5269)</i>	a leek-orchid
<i>Rhizanthella slateri</i>	Eastern Underground Orchid
<i>Cynanchum elegans</i>	White-flowered Wax Plant
<i>Pterostylis gibbosa</i>	Illawarra Greenhood
<i>Eucalyptus glauca</i>	Slaty Red Gum
<i>Rutidosis heterogama</i>	Heath Wrinklewort
<i>Pomaderris brunnea</i>	Rufous Pomaderris
<i>Thesium australe</i>	Austral Toadflax
<i>Grevillea parviflora subsp. parviflora</i>	Small-flower Grevillea
<i>Melaleuca biconvexa</i>	Biconvex Paperbark
<i>Tetraloche juncea</i>	Black-eyed Susan
<i>Acacia bynoeana</i>	Bynoe's Wattle
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid
<i>Eucalyptus parramattensis subsp. decadens</i>	Earp's Gum
<i>Persicaria elatior</i>	Knotweed
<i>Dichanthium setosum</i>	bluegrass
<i>Arthraxon hispidus</i>	Hairy-joint Grass
<i>Angophora inopina</i>	Charmhaven Apple
<i>Caladenia tessellata</i>	Thick-lipped Spider-orchid
<i>Delma impar</i>	Striped Legless Lizard
<i>Aprasia parapulchella</i>	Pink-tailed Worm-lizard

Likelihood of occurrence for EPBC Act listed species

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search (Table C1). Only species listed under the EPBC Act were included in the assessment. Species listed only under the BC Act were assessed as part of determining credit species included in the BAMC.

This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the site inspection and professional judgement. Some

Migratory or Marine species identified from the Commonwealth database search have been excluded from the assessment, due to lack of habitat. The terms for likelihood of occurrence are defined below:

- “known” - the species was or has been observed on the subject land;
- “likely” - a medium to high probability that a species uses the subject land;
- “potential” - suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- “unlikely” - a very low to low probability that a species uses the subject land;
- “no” = habitat within the subject land and in the vicinity is unsuitable for the species.

Pteropus poliocephalus (Grey-headed Flying Fox) was observed flying over the subject land during surveys. A test of significance was conducted for Grey-headed Flying Fox and found that the proposal will require the removal of 0.87ha of native vegetation used for foraging by *Pteropus poliocephalus* (Grey-headed Flying Fox). The removal of 0.87ha of native vegetation is not likely to have a significant impact on the Grey-headed Flying Fox given that the subject land will retain approximately 11.73ha of native vegetation used for foraging and the presence of foraging habitat to the north of the study area.

No other nationally threatened species were recorded within the subject area during fieldwork. Of the remaining species, the site would likely provide foraging trees for woodland bird species. Given the recommendations in Section 7.0, 8.0 and 9.0 of this report the proposal would not likely result in the modification or loss of any suitable habitat that would significantly affect the life cycle of woodland birds or any of the remaining fauna species or place any viable local populations of these species at risk of extinction.

Table C 1 Assessment of likelihood of occurrence of threatened species recorded on the DCCEE database

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
<i>Caladenia tessellata</i>	Thick-lipped Spider-orchid	V	Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. Is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW.	Unlikely	Presence of species was not identified during surveys. No nearby records within the locality.	No	No
<i>Prasophyllum</i> sp. Wybong	A Leek Orchid	CE	Leek orchids are generally found in shrubby and grassy habitats in dry to wet soil (Jones 2006). Known to occur in open eucalypt woodland and grassland.	Low	Presence of species was not identified during surveys. No local records.	No	No
<i>Pterostylis gibbosa</i>	Illawarra Greenhood	E	All known sub-populations occur in open forest and woodland on flat or gently sloping land with poorly drained soils. Within the Hunter Valley this orchid species is confined to the Milbrodale area.	Unlikely	Presence of species was not identified during surveys. No local records.	No	No
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	E1	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	Presence of species was not identified during surveys. No nearby records within the locality.	No	No
<i>Arthraxon hispidus</i>	Hairy-joint Grass	V	Occurs over a wide area in south-east Queensland, and on the northern tablelands and north coast of NSW but is never common. Moisture and shade-loving grass, found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps.	Low	Presence of species was not identified during surveys. No local records.	No	No
<i>Dichanthium setosum</i>	Blue Grass	V	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	Presence of species was not identified during surveys. No local records.	No	No
<i>Cynanchum elegans</i>	White-flowered Wax Plant	E	This species occurs in scattered coastal localities from the QLD-NSW border south to Wollongong. Found in dry, littoral or subtropical rainforest, and occasionally in scrub and woodland from sea	Unlikely	Presence of species was not identified during surveys. No local records.	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			level to about 600m ASL.				
<i>Rutidosia heterogama</i>	Heath Wrinklewort	V	Grows in heath on sandy soils and moist areas in open forest and has been recorded along disturbed roadsides. Recorded from near Cessnock to Kurri Kurri with an outlying occurrence at Howes Valley. On the Central Coast it is located north from Wyong to Newcastle.	Moderate	Presence of species was not recorded during targeted surveys.	No	No
<i>Tetraloche juncea</i>	Black-eyed Susan	V	Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the local government areas of 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	Not identified during surveys.	No	No
<i>Acacia bynoeana</i>	Bynoe's Wattle	V	Found in heath, woodland and dry sclerophyll forests on sandy soils derived from Hawkesbury Sandstone. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple but has also been recorded within Spotted Gum – Ironbark Forest at its most northerly extent in North Rothbury in the Hunter Valley. Found in central eastern NSW, from the Hunter District (Morisset, Kurri Kurri & North Rothbury) south to the Southern Highlands and west to the Blue Mountains.	Unlikely	Presence of this species was not recorded during targeted surveys. No preferred habitat was present.	No	No
<i>Angophora inopina</i>	Charmhaven Apple	V	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	Unlikely	Presence of this species was not identified during targeted surveys. No suitable habitat was present.	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			with a dense shrub understorey on deep white sandy soils over sandstone.				
<i>Eucalyptus glaucina</i>	Slaty Red Gum	V	Grows in grassy woodland and dry eucalypt forest, usually on deep, moderately fertile and well-watered soils. This species has only been recorded on the north coast of NSW and in small populations from Taree to Broke and west of Maitland.	Low	Presence of this species was not identified during surveys.	No	No
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Drooping Red Gum	V	Generally, occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant. In the Kurri Kurri area, <i>E. parramattensis</i> subsp. <i>decadens</i> 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	Presence of this species was not identified during targeted surveys. No preferred habitat was present.	No	No
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	Only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Grows in damp places, often near streams; coastal districts and adjacent tablelands from Jervis Bay north to the Port Macquarie district.	Unlikely	Presence of species was not identified during surveys. No nearby records within the locality.	No	No
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	V	Occurs in a narrow coastal distribution in rainforests on sandy soils or stabilised coastal dunes from Jervis Bay to Bulahdelah in NSW.	Unlikely	Presence of this species was not identified during surveys. No nearby records within the locality. No suitable habitat.	No	No
<i>Euphrasia arguta</i>	Eyebright	CE	Found within the Nundle area reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance.	Unlikely	Presence of species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Persicaria elatior</i>	Tall Knotweed		Recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near	Low	Presence of species was not identified during surveys. No	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
		V	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.		nearby records within the locality.		
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flower Grevillea	v	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 <i>Eucalyptus fibrosa</i> , <i>E. parramattensis</i> , <i>Angophora bakeri</i> and <i>Eucalyptus sclerophylla</i> .	Low	Presence of this species was not identified during surveys.	No	No
<i>Pomaderris brunnea</i>	Brown Pomaderris	V	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	Presence of species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Low	Presence of species was not identified during surveys.	No	No
<i>Rhodomyrtus psidioides</i>	Native Guava	CE	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.	Low	Presence of species was not identified during surveys.	No	No
<i>Thesium australe</i>	Austral Toadflax		Grows in grassland or woodland, often in damp	Low	Presence of this species was	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
		V	sites.		not identified during surveys. No known records within the Maitland LGA.		
<i>Litoria aurea</i>	Green and Golden Bell Frog	V	Inhabits swamps, lagoons, streams and ponds as well as dams, drains and storm water basins.	Low-Moderate	Presence of species was not identified during surveys.	No	No
<i>Mixophyes balbus</i>	Stuttering Frog	V	Occurs in wet forest regions of south-eastern Queensland, Eastern NSW and Victoria. In late spring, eggs are deposited among leaf litter on the banks of streams and subsequently are washed into the water during heavy rain.	Unlikely	Presence of species was not identified during surveys.	No	No
<i>Mixophyes iteratus</i>	Giant Barred Frog	E	Distributed from Doongul Creek, Wongi State Forest, near Maryborough in south-eastern Queensland (Hines 2003), south to Warrimoo in the Blue Mountains, New South Wales. Occurs in rainforests and wet sclerophyll forests in upper to lower catchment areas (Ingram & McDonald 1993).	Unlikely	Presence of species was not identified during surveys.	No	No
<i>Delma impar</i>	Striped Legless Lizard	E	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	Presence of species was not identified during surveys. No known local records.	No	No
<i>Aprasia parapulchella</i>	Pink-tailed Worm-lizard	V	Is distributed along the western foothills of the Great Dividing Range between Bendigo in Victoria and Gunnedah in northern New South Wales. Generally, occupies sites with a grassy ground layer particularly those dominated by Kangaroo Grass with little or no leaf litter, and relatively low tree and shrub cover. Sites are typically well-drained, with rocky outcrops or scattered, partially buried rocks.	Unlikely	Presence of species was not identified during surveys.	No	No
<i>Limosa limosa</i>	Black-tailed Godwit	E	Most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records				

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			elsewhere along the coast, and inland. Usually found in sheltered bays, estuaries, and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps.				
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit	E & M	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 bays. Less frequently it occurs in salt lakes and brackish wetlands, sandy ocean beaches and rock platforms.	Low	Presence of this species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Arenaria interpres</i>	Ruddy Turnstone	V	Found in most coastal regions, with occasional records of inland populations. It strongly prefers rocky shores or beaches where there are large deposits of rotting seaweed.	Unlikely	Presence of this species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	V	Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline salt lakes inland.	Low	Presence of this species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE	Tidal mudflats; saltmarsh; fresh, brackish or saline wetlands; sewage ponds.	Low	Presence of this species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Calidris tenuirostris</i>	Great Knot	V	In NSW, the species has been recorded at scattered sites along the coast down to about Narooma. It has also been observed inland at Tullakool, Armidale, Gilgandra and Griffith. Occurs within sheltered, coastal habitats containing large. Often recorded on sandy beaches with mudflats nearby, sandy spits and islets and sometimes on	Unlikely	Presence of this species was not identified during surveys. No known nearby records within the locality.	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			exposed reefs or rock platforms.				
<i>Charadrius leschenaultii</i>	Greater Sand Plover	V	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	Presence of this species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Charadrius mongolus</i>	Lesser Sand Plover	E	Individuals are rarely recorded south of the Shoalhaven estuary, and there are few inland records. Almost entirely coastal in NSW, favouring the beaches of sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats; occasionally occurs on sandy beaches, coral reefs and rock platforms.	Low	Presence of this species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Gallinago hardwickii</i>	Latham's Snipe, Japanese Snipe	V	Utilises a variety of habitat, such as soft wet ground or shallow water with tussock and other green and dead vegetation, and scrub or open wetland from sea-level to alpine bogs.	Moderate	Presence of this species was not identified during surveys.	No	No
<i>Numenius madagascariensis</i>	Eastern Curlew	CE M	Estuaries, tidal mudflats, sandspits, saltmarshes, mangroves; occasionally fresh or brackish lakes.	Unlikely	Presence of this species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Pluvialis squatarola</i>	Grey Plover	V	Almost entirely coastal, being found mainly on marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats.	Unlikely	Presence of this species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Rostratula australis</i>	Australian Painted snipe	E	Margins of swamps and streams, chiefly those covered with low and stunted vegetation.	Moderate	Presence of species was not identified during surveys.	No	No
<i>Tringa nebularia</i>	Common Greenshank	E	Inhabits a wide variety of inland permanent and temporary wetlands and sheltered coastal habitats of varying salinity.	Unlikely	Presence of this species was not identified during surveys. No known nearby records within the locality.	No	No
<i>Xenus cinereus</i>	Terek Sandpiper	V	The two main sites for the species in NSW are the Richmond River estuary and the Hunter River estuary. In Australia, has been recorded on coastal	Unlikely	Presence of this species was not identified during surveys. No known nearby records	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			mudflats, lagoons, creeks and estuaries.		within the locality.		
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	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.	Low-Moderate	Presence of species was not identified during surveys.	No	No
<i>Callocephalon fimbriatum</i>	Gang Gang Cockatoo	E	Tall montane forests and woodlands in mature wet sclerophyll forests. Requires hollows in which to breed between October and January.	Low	Presence of species was not identified during surveys.	No	No
<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo	V	Lowland coastal forests, dense mountain forests, semi-arid woodland and trees bordering watercourses, with (Allo)Casuarina trees for foraging.	Low	Presence of species was not identified during surveys.	No	No
<i>Lathamus discolor</i>	Swift Parrot	CE M	Open Forest to Woodland, also street trees and in parks and gardens, winter flowering eucalypts for feeding. This species nests in Tasmania during the summer months.	Low - Moderate	Presence of species was not identified during surveys. No Swift Parrot Important Area Mapping occurs within subject land.	No	No
<i>Neophema chrysostoma</i>	Blue-winged Parrot	V	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	Presence of species was not identified during surveys.	No	No
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (south-eastern)	V	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	Presence of species was not identified during surveys.	No	No
<i>Hirundapus caudacutus</i>	White-throated Needletail	V & M	Inhabits the airspace above forests, woodlands, farmlands, plains, lakes, coasts and towns.	Moderate	Presence of species was not identified during surveys.	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
<i>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin	E	Eucalypt woodlands, Acacia scrublands, Banksia dominated coastal scrubs and open forests.	Low	Presence of species was not identified during surveys.	No	No
<i>Stagonopleura guttata</i>	Diamond Firetail	V	Inhabits areas with a grassy, shrubby understorey including Eucalypt woodlands, forests, Acacia scrubs and mallee.	Low-Moderate	Presence of species was not identified during surveys.	No	No
<i>Pycnoptilus floccosus</i>	Pilotbird	V	Found in wet forested areas and heathland in eastern Victoria and south-eastern New South Wales	Unlikely	Presence of this species was not identified during surveys.	No	No
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE M	Temperate woodlands and open forest, including forest edges, preferring to forage on large-flowered Eucalypts.	Low	Presence of species was not identified during surveys. No Regent Honeyeater Important Area Mapping occurs within subject land.	No	No
<i>Grantiella picta</i>	Painted Honeyeater	V	Nomadic, within a range of generally drier forested areas with mistletoes.	Low	Presence of species was not identified during surveys.	No	No
<i>Erythroriorchis radiatus</i>	Red Goshawk	E	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.	Low	Presence of species was not identified during surveys.	No	No
<i>Falco hypoleucos</i>	Grey Falcon	V	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Generally restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	Unlikely	Presence of this species was not identified during surveys.	No	No
<i>Dasyurus maculatus</i> ssp. <i>maculatus</i>	Spotted-tailed Quoll	V	Inhabits sclerophyll forests, rainforests and coastal woodlands. Nests are made in rock caves and hollow logs or trees, and basking sites are usually found nearby.	Low	Presence of this species was not identified during surveys.	No	No

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
<i>Phascolarctos cinereus</i>	Koala	v	Coastal woodland and open forest containing suitable food trees.	Low	Presence of this species was not identified during surveys.	No	No
<i>Macropus parma</i>	Parma Wallaby	V	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	Presence of species was not identified during surveys. No preferred habitat.	No	No
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	v	Found in steep rocky sites in sclerophyll forests with a grassy understorey.	Unlikely	Presence of this species was not identified during surveys. No preferred habitat.	No	No
<i>Potorous tridactylus</i> <i>sp. tridactylus</i>	Long-nosed Potoroo	v	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	Presence of this species was not identified during surveys. No preferred habitat.	No	No
<i>Petaurus australis australis</i>	Yellow-bellied Glider (south-eastern)	V	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	Presence of this species was not identified during surveys.	No	No
<i>Petauroides volans</i>	Greater Glider	v	Eucalypt-dominated low open forests on the coast to tall forests in the ranges and low woodland west of Great Dividing Range. Not found within rainforests.	Low	Presence of this species was not identified during surveys.	No	No
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	v	Known to inhabit open heathlands, open woodlands with a heathland understorey and vegetated sand dunes.	Unlikely	Presence of this species was not identified during surveys.	No	No
<i>Pteropus</i>	Grey-headed		Wet and Dry Sclerophyll Forests, Rainforest,	Known	Individual was observed flying	Yes	Yes

Scientific Name	Common Name	EPBC Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
<i>poliocephalus</i>	Flying-Fox	V	Mangroves and Paperbark swamps and Banksia Woodlands.		over subject land during surveys. Would forage on seasonally flowering Myrtaceous species.		
<i>Chalinolobus dwyeri</i>	Large Pied Bat	v	Occupies dry sclerophyll forest and woodland. Roosts in caves, abandoned mud-nests of Fairy Martins and mine tunnels.	Low	Presence of species was not identified during surveys.	No	No

EPBC Assessment of Significance Under the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines for Vulnerable species present within the subject land.

Pteropus poliocephalus (Grey-headed Flying Fox)

- lead to a long-term decrease in the size of a population.

One individual Grey-headed Flying Fox was recorded flying over and foraging within the subject land during spotlighting surveys. The Grey-headed Flying-fox is considered one population as a result of movement between camps throughout its entire range. No maternity or other roosting habitat which is important habitat for this species was present within the subject land. Suitable foraging habitat in the form of flowering myrtaceous species was present over the subject land. The proposal will result in the removal of up to 0.87ha of foraging habitat of varying quality resulting in an incremental reduction of habitat within the local area. Given the proximity of large areas of similar habitat outside the subject land the proposal is unlikely to lead to a long-term decrease in the size of an important population of this species.

- a. reduce the area of occupancy of the species

The proposal will result in a reduction of up to 0.87ha of foraging habitat for the Grey-headed Flying-fox. Considering the large amount of similar habitat within proximity to the subject land the proposal is unlikely to significantly reduce the extent of the occupancy of an important population.

- b. fragment an existing population into two or more populations

As the Grey-headed Flying-fox is a highly mobile species the removal of up to 0.87ha of foraging habitat is unlikely to fragment an existing population into two or more populations.

- c. adversely affect habitat critical to the survival of a species

As a result of the absence of a maternity or other roost within the subject land or in close proximity the proposal is unlikely to adversely affect habitat critical to the survival of a species.

- d. disrupt the breeding cycle of a population

Given that there was no maternity or other roost within the subject land or in close proximity the proposal is unlikely to disrupt the breeding cycle of a population.

- e. modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The proposal will result in a reduction of up to 0.87ha of foraging habitat, however taking into considering the large amount of similar habitat within proximity to the subject land (approximately 11.73ha) and the high mobility of the Grey-headed Flying-fox no significant areas are to be modified, destroyed, removed, isolated or decreased to the extent that the species is likely to decline.

- f. result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

The proposal is unlikely to result in the establishment of invasive species that is harmful to this species.

- g. introduce disease that may cause the species to decline, or

The proposal is unlikely to result in the introduction of a disease that may cause the species to decline.

- h. interfere with the recovery of the species.

Considering the above factors, the proposal is unlikely to interfere with the recovery of the Grey-headed Flying-fox.

Conclusion

Considering the above factors, the proposal is unlikely to have a significant impact on the Grey-headed Flying-fox and therefore referral would not be required.

- migratory species protected under international agreements;

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

Migratory Terrestrial Birds

<i>Cuculus optatus</i>	Oriental Cuckoo
<i>Hirundapus caudacutus</i>	White-throated Needletail
<i>Monarcha melanopsis</i>	Black-faced Monarch
<i>Monarcha trivirgatus</i>	Spectacled Monarch
<i>Motacilla flava</i>	Yellow Wagtail
<i>Myiagra cyanoleuca</i>	Satin Flycatcher
<i>Rhipidura rufifrons</i>	Rufous Fantail

Migratory Wetland Birds

<i>Arenaria interpres</i>	Ruddy Turnstone
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper
<i>Calidris ferruginea</i>	Curlew Sandpiper
<i>Calidris melanotos</i>	Pectoral Sandpiper
<i>Calidris ruficollis</i>	Red-necked Stint
<i>Calidris tenuirostris</i>	Great Knot
<i>Charadrius bicinctus</i>	Double-banded Plover
<i>Charadrius leschenaultii</i>	Greater Sand Plover

<i>Charadrius mongolus</i>	Lesser Sand Plover
<i>Gallinago hardwickii</i>	Latham's Snipe
<i>Limicola falcinellus</i>	Broad-billed Sandpiper
<i>Limosa lapponica</i>	Bar-tailed Godwit
<i>Limosa limosa</i>	Black-tailed Godwit
<i>Numenius madagascariensis</i>	Eastern Curlew
<i>Numenius phaeopus</i>	Whimbrel
<i>Pandion haliaetus</i>	Osprey
<i>Philomachus pugnax</i>	Ruff (Reeve)
<i>Pluvialis fulva</i>	Pacific Golden Plover
<i>Pluvialis squatarola</i>	Grey Plover
<i>Tringa brevipes</i>	Grey-tailed Tattler
<i>Tringa nebularia</i>	Common Greenshank
<i>Tringa stagnatilis</i>	Marsh Sandpiper
<i>Xenus cinereus</i>	Terek Sandpiper

Migratory Marine Birds

<i>Apus pacificus</i>	Fork-tailed Swift
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Under the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines (Department of the Environment, Water, Heritage and the Arts, 2009) an action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.
- Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or
- Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

No threatened migratory species were recorded within the site. Potential habitat was considered present for a number of the listed migratory species. The proposal is unlikely to have a significant impact on any of these species.

- 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.



EPBC Act Protected Matters Report

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

Report created: 02-Jul-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar):	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	9
Listed Threatened Species:	66
Listed Migratory Species:	32

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	18
Commonwealth Heritage Places:	1
Listed Marine Species:	43
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	5
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	36
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Hunter estuary wetlands	Within 10km of Ramsar site	In feature area

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

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

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
<u>Anthochaera phrygia</u> Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Arenaria interpres</u> Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<u>Botaurus poiciloptilus</u> Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Calidris acuminata</u> Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Calidris tenuirostris</u> Great Knot [862]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<u>Callocephalon fimbriatum</u> Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Calyptorhynchus lathami lathami</u> South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Charadrius leschenaultii</u> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
<u>Charadrius mongolus</u> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Climacteris picumnus victoriae</u> Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Erythrotriorchis radiatus</u> Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
<u>Falco hypoleucos</u> Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Grantiella picta</u> Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Hirundapus caudacutus</u> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Lathamus discolor</u> Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Limosa lapponica baueri</u> Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In buffer area only
<u>Limosa limosa</u> Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area	In buffer area only
<u>Melanodryas cucullata cucullata</u> South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In feature area
<u>Neophema chrysostoma</u> Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Pluvialis squatarola</u> Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<u>Pycnoptilus floccosus</u> Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In feature area
<u>Rostratula australis</u> Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Stagonopleura guttata</u> Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<u>Tringa nebularia</u> Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Xenus cinereus</u> Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
FROG			
<u>Litoria aurea</u> Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Mixophyes balbus</u> Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<u>Mixophyes iteratus</u> Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
MAMMAL			
<u>Chalinolobus dwyeri</u> Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Dasyurus maculatus maculatus (SE mainland population)</u> Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Notamacropus parma</u> Parma Wallaby [89289]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<u>Petauroides volans</u> Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Petaurus australis australis</u> Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Petrogale penicillata</u> Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<u>Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</u> Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
<u>Potorous tridactylus tridactylus</u> Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat may occur within area	In feature area
<u>Pseudomys novaehollandiae</u> New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Pteropus poliocephalus</u> Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
<u>Acacia bynoeana</u> Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<u>Angophora inopina</u> Charmhaven Apple [64832]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Eucalyptus glaucina Slaty Red Gum [5670]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus parramattensis subsp. decadens Earp's Gum, Earp's Dirty Gum [56148]	Vulnerable	Species or species habitat known to occur within area	In feature area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Grevillea parviflora subsp. parviflora Small-flower Grevillea [64910]	Vulnerable	Species or species habitat known to occur within area	In feature area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Pomaderris brunnea</u> Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area	In feature area
<u>Prasophyllum sp. Wybong (C.Phelps ORG 5269)</u> a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area	In feature area
<u>Pterostylis gibbosa</u> Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area	In feature area
<u>Rhizanthella slateri</u> Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area
<u>Rhodamnia rubescens</u> Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Rhodomyrtus psidioides</u> Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<u>Rutidosis heterogama</u> Heath Wrinklewort [13132]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Syzygium paniculatum</u> Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Tetratheca juncea</u> Black-eyed Susan [21407]	Vulnerable	Species or species habitat known to occur within area	In feature area
<u>Thesium australe</u> Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
<u>Aprasia parapulchella</u> Pink-tailed Worm-lizard, Pink-tailed Legless Lizard [1665]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Delma impar Striped Legless Lizard, Striped Snake-lizard [1649]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species [\[Resource Information \]](#)

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area

Migratory Terrestrial Species

Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area

Migratory Wetlands Species

Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
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Scientific Name	Threatened Category	Presence Text	Buffer Status
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Species or species habitat known to occur within area	In buffer area only
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area	In buffer area only
Calidris tenuirostris Great Knot [862]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Xenus cinereus</u> Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [\[Resource Information \]](#)

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

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [11627]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [11609]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11623]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11605]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11604]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11619]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11608]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [12650]	NSW	In buffer area only
Defence		
Commonwealth Land - Director of Defence Service Homes [11621]	NSW	In buffer area only
Defence - SCOBIE BARRACKS ; 2/17 RNSWR RUTHERFORD ; RUTHERFORD GRES DEPOT [10055]	NSW	In buffer area only
Defence - Defence Housing Authority		
Commonwealth Land - Defence Housing Authority [11628]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11626]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [11620]	NSW	In buffer area only
Transport and Regional Services - Airservices Australia		

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Airservices Australia [11629]	NSW	In buffer area only

Unknown		
Commonwealth Land - [11625]	NSW	In buffer area only
Commonwealth Land - [11624]	NSW	In buffer area only
Commonwealth Land - [12652]	NSW	In buffer area only
Commonwealth Land - [16528]	NSW	In buffer area only

Commonwealth Heritage Places			[Resource Information]
Name	State	Status	Buffer Status
Historic			
Maitland Post Office	NSW	Listed place	In buffer area only

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Arenaria interpres			
Ruddy Turnstone [872]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u><i>Calidris melanotos</i></u> Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
<u><i>Calidris pugnax</i> as <i>Philomachus pugnax</i></u> Ruff [91256]		Species or species habitat known to occur within area overfly marine area	In buffer area only
<u><i>Calidris ruficollis</i></u> Red-necked Stint [860]		Species or species habitat known to occur within area overfly marine area	In buffer area only
<u><i>Calidris tenuirostris</i></u> Great Knot [862]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In buffer area only
<u><i>Chalcites osculans</i> as <i>Chrysococcyx osculans</i></u> Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In buffer area only
<u><i>Charadrius bicinctus</i></u> Double-banded Plover [895]		Species or species habitat known to occur within area overfly marine area	In buffer area only
<u><i>Charadrius leschenaultii</i></u> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In feature area
<u><i>Charadrius mongolus</i></u> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area	In buffer area only
<u><i>Charadrius ruficapillus</i></u> Red-capped Plover [881]		Species or species habitat known to occur within area overfly marine area	In buffer area only
<u><i>Gallinago hardwickii</i></u> Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]	Endangered	Species or species habitat known to occur within area overfly marine area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius phaeopus Whimbrel [849]		Species or species habitat known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In buffer area only
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known to occur within area overfly marine area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<u>Rostratula australis as Rostratula benghalensis (sensu lato)</u> Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
<u>Sterna striata</u> White-fronted Tern [799]		Migration route may occur within area	In feature area
<u>Symposiachrus trivirgatus as Monarcha trivirgatus</u> Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
<u>Tringa brevipes as Heteroscelus brevipes</u> Grey-tailed Tattler [851]		Species or species habitat known to occur within area	In buffer area only
<u>Tringa nebularia</u> Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
<u>Tringa stagnatilis</u> Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area overfly marine area	In buffer area only
<u>Xenus cinereus</u> Terek Sandpiper [59300]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves			<u>[Resource Information]</u>
Protected Area Name	Reserve Type	State	Buffer Status
Hexham Swamp	NRS Addition - Gazettal in Progress	NSW	In buffer area only
Hunter Wetlands	National Park	NSW	In buffer area only
Pambalong	Nature Reserve	NSW	In buffer area only
Sugarloaf	State Conservation Area	NSW	In buffer area only
Werakata	State Conservation Area	NSW	In buffer area only

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

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

Nationally Important Wetlands [\[Resource Information \]](#)

Wetland Name	State	Buffer Status
Hexham Swamp	NSW	In buffer area only

EPBC Act Referrals [\[Resource Information \]](#)

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Kurri Kurri Lateral Pipeline Project	2021/9113		Post-Approval	In buffer area only
M1 Motorway extension to Raymond Terrace, NSW	2018/8288		Post-Approval	In buffer area only
Regrowth Kurri Kurri - Residential and Employment Rezoning	2023/09572		Approval	In buffer area only
Controlled action				
F3 to Branxton Link Electricity Adjustments	2007/3814	Controlled Action	Post-Approval	In buffer area only
Gas Transmission Pipeline	2011/5917	Controlled Action	Completed	In buffer area only
Gloucester Coal Seam Methane Gas Project	2008/4432	Controlled Action	Post-Approval	In buffer area only
Hunter Employment Zone - Stage 1, Road and Rail access	2002/653	Controlled Action	Completed	In buffer area only
Kurri Kurri Gas Fired Power Station	2021/8888	Controlled Action	Post-Approval	In buffer area only
New dual carriageway from F3 Fwy to Branxton Link	2007/3431	Controlled Action	Post-Approval	In buffer area only
Pelaw Main Bypass Road near Cessnock	2007/3891	Controlled Action	Completed	In buffer area only
Port Site and Materials Handling Development	2001/242	Controlled Action	Completed	In buffer area only
Queensland Hunter Gas Pipeline, approximately 825 km in length	2008/4483	Controlled Action	Completed	In buffer area only
River Dredging Operations	2001/249	Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Upgrade of approx 32km of Main Northern Railway, including construction of 3rd track	2009/4897	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Abel Coal Project	2007/3695	Not Controlled Action	Completed	In buffer area only
Battery Recycling Facility, Kurri Kurri, NSW	2016/7782	Not Controlled Action	Completed	In buffer area only
Bloomfield Colliery - Life of Mine Extension - 20km northwest of Newcastle, NSW	2017/8132	Not Controlled Action	Completed	In buffer area only
construction of 33kV substation and relocation of power line	2005/2395	Not Controlled Action	Completed	In buffer area only
Extension of underground mining operations at the existing Tasman Underground Mine	2011/6211	Not Controlled Action	Completed	In buffer area only
Freeway North Business Park Sub-division and Industrial Development	2008/4569	Not Controlled Action	Completed	In buffer area only
Green & Golden Bell Frog Habitat Enhancement Project	2004/1795	Not Controlled Action	Completed	In buffer area only
Hebburn No 2 Colliery	2001/301	Not Controlled Action	Completed	In buffer area only
Hexam Train Support Facility	2012/6285	Not Controlled Action	Completed	In buffer area only
Hexham Relief Roads Project	2012/6309	Not Controlled Action	Completed	In buffer area only
Hunter Natural Gas Pipeline	2004/1902	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Industrial and Residential Subdivision, Minmi and Black Hill, Lower Hunter	2008/4603	Not Controlled Action	Completed	In buffer area only
Queensland Hunter Gas Pipeline, approximately 833 km in length	2008/4620	Not Controlled Action	Completed	In buffer area only
Remediation and demolition of Hydro Aluminium Kurri Kurri Smelter, NSW	2015/7496	Not Controlled Action	Completed	In buffer area only
Revised alignment Hunter Natural Gas Pipeline	2005/2470	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Richmond Vale Rail Trail	2019/8568	Not Controlled Action	Completed	In buffer area only
Sandgate Rail Grade Separation	2005/1948	Not Controlled Action	Completed	In buffer area only
Tomago to Tomaree Electricity Supply Upgrade	2003/1023	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Collection and reprocessing of carbonaceous materials	2005/2196	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Rehabilitation of Hexham Swamp	2003/1244	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Rezoning and Residential Development of Avery's Village, Cessnock, NSW	2007/3880	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

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

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

Please feel free to provide feedback via the [Contact us](#) page.

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Appendix D: Vegetation survey data

Table D1 Vegetation BAM Plot survey data and locations

plot	pct	area	patchsize	condition class	zone	easting	northing	bearing	compTree	compShrub	compGrass	compForbs	compFerns	compOther	strucTree	strucShrub	strucGrass	strucForbs	strucFerns	strucOther	funLargeTrees	funHollowtrees	funLitterCover	funLenFallenLogs	funTreeStem5to9	funTreeStem10to19	funTreeStem20to29	funTreeStem30to49	funTreeStem50to79	funTreeRegen	funHighThreatExotic	Plot-based vegetation survey?	Vegetation integrity survey?
1A	3444	0.69	101	Moderate	56	366211	6373421	280	2	3	9	10	0	1	320	03	3.0	3.0	0.0	0.6	5	2	254	105	0	0	1	1	1	1	3	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
1B	3444	0.69	101	Moderate	56	366378	6373418	86	5	4	3	5	0	1	24.0	26	4.6	0.9	0.0	0.2	6	0	420	0.0	0	1	1	1	1	0	30	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2A	3444	2.09	101	Derived_grassland	56	366330	6373410	79	2	5	7	11	0	1	3.0	1.0	164	1.5	0.0	0.1	0	0	328	7.0	0	0	1	0	0	1	0.4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2B	3444	2.09	101	Derived_grassland	56	366171	6373396	81	1	0	7	4	1	0	0.4	0.0	18.7	0.5	0.1	0.0	0	0	48	0.0	0	0	0	0	0	1	32	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3A	3328	0.18	101	Moderate	56	366090	6373333	196	1	0	3	6	0	0	300	0.0	21	8.9	0.0	0.0	4	0	152	22	0	0	1	1	1	1	84	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
4A	3328	0.30	101	Derived_grassland	56	366084	6373353	102	1	0	7	4	0	0	5.0	0.0	39.2	0.4	0.0	0.0	0	0	54	0.0	0	0	0	0	0	1	72	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
5A	3975	0.50	101	Fair	56	365896	6373235	266	0	0	3	1	0	0	0.0	0.0	95.1	0.2	0.0	0.0	0	0	220	0.0	0	0	0	0	0	0	4.7	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
6A	3446	0.19	101	Carex_dominant	56	365938	6373254	254	0	0	3	4	0	0	0.0	0.0	51.5	1.3	0.0	0.0	0	0	84	0	0	0	0	0	0	0	1.6	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

Figure D 1 Location: Vegetation BAM Plot locations.



Job Ref	12503
A4 Scale	1:3,500

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 portrayed 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.

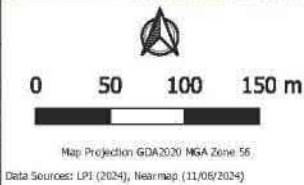


Figure D1
BAM Floristic Plot Locations
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 24 July 2024

(a Division of Tattersall Lander Pty Ltd)
 ABN 41 003 509 215

Plates D1 – D12 BAM Plot Field Data Sheets

Paddock Tree PCT

Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site – Field Survey Form Plot Identifier: 1A

Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders
E-366211 N-6373421	E-366162 N-6373439	20x50	20/4/21	Start -	End -	DAVID KYLE NICOLA
Photo# #699Z		Photo# #699Z		IBRA region		SYDNEY BASIN
Bearing 1280°		Bearing 102°		Vegetation Class		Hunter Macleay Dry Sclerophyll Forest
PCT # 1600		PCT Name		Vegetation Zone		PCT 3444 - Moderate
Consistent BC ACT TEC? Yes		PCT Name Spotted Gum - Red Ironbark - Narrow leaved Ironbark, Grey Box shrub grass open forest of the Lower Hunter.				
		Lower Hunter spotted gum Ironbark Forest in the Sydney Basin and New North Coast Bioregions				

BAM Attribute (400 m ² plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	3
	Grasses etc.	9
	Forbs	10
	Ferns	0
	Other	1
Sum of Cover of native vascular plants by growth form group	Trees	3.2
	Shrubs	0.3
	Grasses etc.	3.0
	Forbs	3.0
	Ferns	0
	Other	0.6
High Threat Weed cover		2.9

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	1-19 0-86	# Z
50 - 79 cm	0-51, 0-59, 0-62	
30 - 49 cm	1	
20 - 29 cm	1	
10 - 19 cm		
5 - 9 cm		
Regeneration < 5 cm	1	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	1-05 2-5 2-8 4-1	Total 10.45

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)	70 20 30 25	0 0 7 1 0	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	25.4	1	0	0

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	Soil	Microrelief
Lithology	Soil Surface Texture	Soil Colour	Soil Depth	
Slope	Aspect	Site Drainage	Distance to nearest water and type	
	4°	SW		

Additional Plot Comments
 Pile of logs with str

Wildthing Environmental Consultants - Office # (02) 49513311

400 m ² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 20/4/21		2A	DARYL, KYLIE, NICOLA

GF	Species	Cover	Abund	voucher
T	1 <i>Conylobia maculata</i>	27	25	
T	2 <i>Eucalyptus sideroxyloides</i>	5	1	
F	3 <i>Dichondra repens</i>	1	500	
F	4 <i>Lobelia purpureascens</i>	1	1000	
O	5 <i>Glycine clandestina</i>	0.6	500	
-	6 * <i>Sida rhombifolia</i>	2	300	
MHTW	7 * <i>Lantana camara</i>	0.3	3	
HTW	8 <i>Erhantia erecta</i>	0.2	100	
-	9 <i>Plantago lanceolata</i>	1	1000	
HTW	10 <i>Senecio madagascariensis</i>	0.2	50	
G	11 <i>Cymbopogon refractus</i>	0.3	10	
G	12 <i>Mikalana stipodes</i>	2	2000	
F	13 <i>Caesia parviflora</i>	0.1	20	
HTW	14 <i>Paspalum dilatatum</i>	0.2	50	
F	15 <i>Oxalis perennans</i>	0.1	420	
-	16 <i>Hypochaeris radicata</i>	0.3	50	
F	17 <i>Aperis canescens</i>	0.1	10	
HTW	18 <i>Opuntia stricta</i>	0.1	2	
-	19 <i>Phyllanthus tenellus</i>	0.1	2	
S	20 <i>Breynia oblongifolia</i>	0.1 ^{seedling}	2	
G	21 <i>Aristida racemosa</i>	0.1	10	
F	22 <i>Commelina cyanea</i>	0.3	200	
G	23 <i>Echinopogon acutus</i>	0.1	2	
G	24 <i>Paspalidium distans</i>	0.2	200	
G	25 <i>Aristida vagans</i>	0.1	10	
S	26 <i>Lycopogon juniperinus</i>	0.1	1	
HTW	27 <i>Axonopus affinis</i>	1	200	
HTW	28 <i>Bidens pilosa</i>	0.3	200	
-	29 <i>Conyza bonariensis</i>	0.1	10	
F	30 <i>Wahlenbergia gracilis</i>	0.1	20	
-	31 <i>Juncus effusus</i>	0.1	10	
HTW	32 <i>Cenchrus clandestinus</i>	0.4	100	
S	33 <i>Rapana variabilis</i>	0.1	1	
-	34 <i>Cyperus brevifolius</i>	0.1	50	
HTW	35 <i>Dicentra sp. cuspidata</i>	0.2	3	
G	36 <i>Rytidosperma sp.</i>	0.1	1	
G	37 <i>Camandra multiflora</i>	0.1	1	
F	38 <i>Dianella caesia caesia</i>	0.1	3	
F	39 <i>Solanum prinophyllum</i>	0.1	1	
F	40 <i>Enardia hastata</i>	0.1	20	
-	41 <i>Solanum nigra</i>	0.1	2	
	42			
	43			
	44			

Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site - Field Survey Form Plot Identifier: 1B

Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders
E-366378 N-6373418	E-366427 N-6373409	20x20	20/9/21	Start -	End -	DAVID NICOLE
Photo# # 6977	Photo# # 6978	IBRA region	SYDNEY BASIN			
Bearing 86°	Bearing 259°	Vegetation Class	Hunter Macleay Dry Sclerophyll Forest			
PCT # 1600	PCT Name	Spotted Gum Ironbark-Narrow-leaved Ironbark Grey Box, shrub grass open forest of the lower Hunter.				
Consistent BC ACT TEC?	yes, lower Hunter Spotted Gum Ironbark Forest					

BAM Attribute (400 m ² plot)	Sum values
Trees	5
Shrubs	4
Grasses etc.	3
Forbs	5
Ferns	0
Other	1
Sum of Cover of native vascular plants by growth form group	
Trees	24
Shrubs	2.6
Grasses etc.	4.6
Forbs	0.9
Ferns	0
Other	0.2
High Threat Weed cover	3.0

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80+ cm		
50-79 cm	0.51, 0.66, 0.57, 0.59 0.55, 0.62	
30-49 cm	1	
20-29 cm	1	0
10-19 cm	1	
5-9 cm		
Regeneration < 5 cm	1	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	

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)	40 70 15 35 50 3	2 1 1 6	1 0 0 0 0	2 0 0 0 4
Average of the 5 subplots	42	2.6	0.2	1.2

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

On slope in far NE of impact area

Wildthing Environmental Consultants - Office # (02) 49513311

400 m ² plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	20/4/21		1B	DARYL, KYLIE, NICOLA

GF	Species	Cover	Abund	voucher
T	1 <i>Corymbia maculata</i>	10	5	
T	2 <i>Eucalyptus siderophora</i>	5	2	
T	3 <i>Eucalyptus tereticornis</i>	5	4	
T	4 <i>Eucalyptus punctata</i>	3	1	
T	5 <i>Notelaea longifolia</i>	1	7	
S	6 <i>Breynia dolanifolia</i>	2	10	
S	7 <i>Leucopogon juniperinus</i>	0.2	2	
S	8 <i>Bursaria spinosa</i>	0.2	5	
G	9 <i>Imperata cylindrica</i> var. <i>major</i>	4	300	
F	10 <i>Dichandra repens</i>	0.3	500	
F	11 <i>Dianella caerulea caerulea</i>	0.2	11	
O	12 <i>Desmodium oarianans</i>	0.2	50	
F	13 <i>Labellia purpurescens</i>	0.2	100	
G	14 <i>Microstachya stipoides</i>	0.5	500	
-	15 <i>Sonchus oleraceus</i>	0.1	2	
-	16 <i>Hypochaeris radicata</i>	0.3	100	
MHTW	17 <i>Lantana camara</i>	1	12	
-	18 <i>Plantago lanceolata</i>	0.5	200	
HTW	19 <i>Bidens pilosa</i>	2	100	
S	20 <i>Echinopogon avatus</i>	0.1	20	
-	21 <i>Cenchrus bananiensis</i>	0.2	20	
-	22 <i>Solanum nigrum</i>	0.2	10	
F	23 <i>Solanum prinosphyllum</i>	0.1	3	
-	24 <i>Cirsium vulgare</i>	0.1	1	
S	25 <i>Acacia falcata</i>	0.2	2	
F	26 <i>Oxalis parennans</i>	0.1	20	
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Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site - Field Survey Form Plot Identifier: 2A

Midline start		Midline end		Plot Size	Date	Plot Waypoint ID		Recorders
E-366330		E-366376		20x50	20/4/21	Start -	End -	DARIC KELIE NICOLA
N-6373410		N-6373409		IBRA region	SYDNEY BASIN			
Photo#	#6966	Photo#	#6967	Vegetation Class	Hunter Macleay Dry Sclerophyll Forest			
Bearing	79°	Bearing	268°	Vegetation Zone	PCT 3444 (derived)			
PCT #		PCT Name: Spotted Gum - Red Ironbark - Narrow-leaved Ironbark - Grey Box shrub open forest of the lower Hunter						
Consistent BC ACT TEC?	yes	Lower Hunter Spotted Gum - Ironbark forest in the Sydney Basin and North Basin ^{Basin} regions.						

BAM Attribute (400 m ² plot)	Sum values
Trees	2
Shrubs	5
Grasses etc.	7
Forbs	11
Ferns	0
Other	1
Count of Native Richness	
Trees	3.0
Shrubs	1.0
Grasses etc.	16.4
Forbs	1.5
Ferns	0
Other	0.1
Sum of Cover of native vascular plants by growth form group	
High Threat Weed cover	0.4

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 - 79 cm	0	
30 - 49 cm	0	
20 - 29 cm	1	
10 - 19 cm	0	
5 - 9 cm	0	
Regeneration < 5 cm	1	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0.55 0.9 1.0 1.2 1.25	2.1 Total 7.0

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)	15 39 60 20 35	7 10 13 3 15	10 10 8 7 20	0 0 0 0 0
Average of the 5 subplots	32.8	9.6	7.4	0

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

Pile of logs were located within rectangle kangaroo seats
 In casement, good vegetation groundcover

East Maitland

Wildthing Environmental Consultants - Office # (02) 49513311

400 m ² plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date			2A	DARYL, FYLIE, NICOLA

GF	Species	Cover	Abund	voucher
I	1 <i>Eucalyptus tereticornis</i>	2	7	
I	2 <i>Corymbia maculata</i>	1	3	
G	3 <i>Aristida vagans</i>	15	4000	
F	4 <i>Epaltes australis</i>	0.3	200	
F	5 <i>Catolpa cuneifolia</i>	0.2	15	
G	6 <i>Lomandra multiflora</i>	0.1	10	
G	7 <i>Paspalidium distans</i>	0.5	150	
G	8 <i>Cymbopogon refractus</i>	0.2	5	
S	9 <i>Daviscia ulicifolia</i>	0.2	15	
S	10 <i>Acacia falcata</i>	0.3	3	
G	11 <i>Digitaria parviflora</i>	0.3	100	
HTW	12 <i>Bidens pilosa</i>	0.2	10	
S	13 <i>Lancepogon juniperinus</i>	0.2	3	
F	14 <i>Labellia purpurescens</i>	0.1	20	
—	15 <i>Hypochaeris radicata</i>	0.2	20	
—	16 <i>Eragrostis ciliaris</i> <small>apiculatum</small>	0.5	1000	
F	17 <i>Chrysocephalum</i>	0.2	20	
F	18 <i>Hypericum gramineum</i>	0.1	50	
S	19 <i>Ozothamnus diosmifolius</i>	0.1	5	
G	20 <i>Echinochloa crusgalli</i>	0.2	30	
O	21 <i>Glycine clandestina</i>	0.1	50	
S	22 <i>Bursaria spinosa</i>	0.2	2	
HTW	23 <i>Senecio madagascariensis</i>	0.2	20	
F	24 <i>Hydrocotyle sibthorpioides</i>	0.1	5	
—	25 <i>Conyza bonariensis</i>	0.1	10	
—	26 <i>Plantago lanceolata</i>	0.1	20	
—	27 <i>Gnaphalium sp. (Rosetta)</i>	0.1	10	
F	28 <i>Dianella caerulea caerulea</i>	0.1	2	
F	29 <i>Caesia parviflora</i>	0.1	15	
F	30 <i>Hyposiphon hygrometrica</i>	0.1	1	
F	31 <i>Walanbergia gracillia</i>	0.1	5	
F	32 <i>Vernonia cinerea</i>	0.1	3	
G	33 <i>Fimbristylis dicotoma</i>	0.1	5	
	34			
	35			
	36			
	37			
	38			
	39			
	40			
	41			
	42			
	43			
	44			

PCT Pasture 1

Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site - Field Survey Form Plot Identifier: **2B**

Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders
				Start -	End -	
E-366171 N-637338	E-366221 N-637338	20x20	20/4/21			DAVID KYLE NICOLA
Photo# #6940	Photo# #6941	IBRA region	Sydney Basin			
Bearing 81°	Bearing 264°	Vegetation Class	Hunter Macleay Dry Sclerophyll Forest			
PCT # 1600	PCT Name	Spotted Gum - Ironbark, Narrow-leaved Ironbark, Grey Box shrub grassy forest of the lower Hunter Basin and NSW North coast Bio regions.				
Consistent BC ACT TEC? Yes	Lower Hunter Spotted Gum, Ironbark Forest in the Sydney Basin and NSW North coast Bio regions.					

BAM Attribute (400 m ² plot)		Sum values
Trees		1
Shrubs		0
Count of Native Richness	Grasses etc.	7
	Forbs	4
	Ferns	1
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0.4
	Shrubs	0
	Grasses etc.	18.7
	Forbs	0.5
	Ferns	0.1
Other		0
High Threat Weed cover		3.2

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 - 79 cm	0	
30 - 49 cm	0	
20 - 29 cm	0	
10 - 19 cm	0	
5 - 9 cm	0	
Regeneration < 5 cm	1	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	

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)	1 6 7 6 4	2 1 1 2 2	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	4.8	1.6	0	0

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

Wildthing Environmental Consultants - Office # (02) 49513311

400 m ² plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders	
Date			ZB		
GF	Species	Cover	Abund	voucher	
F	1 <i>Corymbia maculata</i>	0.4	5		
—	2 <i>Setaria parviflora</i>	2	1000		
G	3 <i>Sporobolus erodion</i>	0.2	15		
G	4 <i>Cymbopogon refractus</i>	0.3	18		
HTW	5 <i>Senecio madagascariensis</i>	0.5	100		
—	6 <i>Hypochaeris radicata</i>	3	1000		
G	7 <i>Panicum effusum</i>	0.1	300		
HTW	8 <i>Axonopus fissifolius</i>	2	1000		
—	9 <i>Plantago lanceolata</i>	3	2000		
—	10 <i>Trifolium repens</i>	1	400		
—	11 <i>Gnaphalium sp. (chama)</i>	0.1	20		
F	12 <i>Calceolaria purpurascens</i>	0.1	5		
F	13 <i>Hypericum graminifolium</i>	0.2	200		
—	14 <i>Cyperus brevifolius</i>	1	2000		
G	15 <i>Cynodon dactylon</i>	1.5	2000		
—	16 <i>Phyllanthus tenellus</i>	0.1	10		
G	17 <i>Eragrostis braunii</i>	0.1	1000		
E	18 <i>Chelanthus sieberi</i>	0.1	10		
—	19 <i>Gonyza bonariensis</i>	0.3	50		
F	20 <i>Oxalis perennans</i>	0.1	10		
—	21 <i>Sida rhombifolia</i>	0.1	2		
F	22 <i>Veronica plebeia</i>	0.1	2		
—	23 <i>Trifolium campestre</i>	0.1	3		
HTW	24 <i>Paspalum dilatatum</i>	0.5	200		
G	25 <i>Microlophus stipoides</i>	2	1000		
G	26 <i>Rytidosperma sp.</i>	0.1	10		
HTW	27 <i>Bidens pilosa</i>	0.2	20		
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R22 Class - Moderate

Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site - Field Survey Form						Plot Identifier: 3A	
Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders	
		20x50	19/4/21	Start -	End -		
E- 366090 N- 6373333	E- 366068 N- 6373290	IBRA region	SYDNEY BASIN				
Photo# 6890	Photo# 6889	Vegetation Class	Coastal Swamp Forest				
Bearing 196	Bearing 65°	Vegetation Zone	PCT 3328 - Moderate				
PCT # 1598	PCT Name Forest Red Gum grassy open forest on floodplains of the lower Hunter						
Consistent BC ACT TEC? Yes	Hunter Lowland Red Gum Forest in the Sydney Basin and North Coast R22 regions						

BAM Attribute (400 m ² plot)		Sum values
Trees		1
Shrubs		0
Grasses etc.		3
Forbs		6
Ferns		0
Other		0
Count of Native Richness		
Sum of Cover of native vascular plants by growth form group		
Trees		30
Shrubs		-
Grasses etc.		2.1
Forbs		8.9
Ferns		-
Other		-
High Threat Weed cover		8.4

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		
50 - 79 cm	0.52, 0.59, 0.55	
30 - 49 cm	1	
20 - 29 cm	1	
10 - 19 cm		
5 - 9 cm		
Regeneration < 5 cm	1	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	2-2	

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)	15 2 7 12 40	0 1 2 4 2	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	15.2	1.8	0	0

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

Wildthing Environmental Consultants - Office # (02) 49513311

400 m ² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 19/4/21		3A	DARREN, KYLIE, NICOLA

GF	Species	Cover	Abund	voucher
I	1 Eucalyptus teretiformis	30	11	
-	2 Sida rhombifolia	13	600	
MHTW	3 Lantana camara	0.5	2	
-	4 Tagetes minuta	8	300	
HTW	5 Bidens pilosa	1	100	
-	6 Lepidium africanum	0.1	10	
HTW	7 Euphorbia erecta	0.3	100	
-	8 Trifolium repens	0.2	20	
F	9 Commelia cyanea	8	1000	
HTW	10 kikuyu Pennisetum	6	1000	
G	11 Mikalana stipoides	1	500	
F	12 Enada hastata	0.1	10	
-	13 Plantago lanceolata	1	200	
-	14 Hypochaeris radicata	0.2	50	
-	15 Conyza bonariensis	0.1	5	
F	16 Asperula confertus	0.4	500	
F	17 Oxalis peruviana	0.1	50	
HTW	18 Paspalum dilatatum	0.3	100	
-	19 Sonchus oleraceus	0.1	10	
-	20 Verbena bonariensis	0.2	15	
F	21 Enada nutans	0.2	20	
-	22 Sporobolus africanus	0.1	10	
HTW	23 Axonopus fissifolius	0.2	50	
-	24 Stellaria media	0.1	20	
-	25 Chenopodium album	0.1	3	
-	26 Cirsium vulgare	0.1	1	
-	27 Taraxacum officinale	0.1	10	
MHTW	28 Olea europaea europaea	0.1	1	
F	29 Lobelia purpurascens	0.1	100	
-	30 Solanum nigrum	0.2	10	
-	31 Panicum maximum	0.1	5	
G	32 Cynodon dactylon	1	300	
-	33 Setaria gracilis	0.2	50	
G	34 Digitaria pruriens	0.1	10	
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Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site - Field Survey Form				Plot Identifier: 4A		
Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders
E- 366084 N- 6373353	E- 366127 N- 6373333	20x20	20/4/21	Start -	End -	DARYL KYLE NICOLA
Photo# #6927	Photo# #6928	IBRA region	Sydney Basin			
Bearing 102°	Bearing 281°	Vegetation Class	Coastal Swamp Forest			
PCT #	PCT Name	Forest Red Gum Grassy Open Forest on Flood plains of the lower Hunter				
Consistent BC ACT TEC?	Hunter lowland Red Grassy open Forest in the Sydney Basin and North coast Bioregions.					

BAM Attribute (400 m ² plot)	Sum values
Trees	1
Shrubs	0
Grasses etc.	7
Forbs	4
Ferns	0
Other	0
Count of Native Richness	
Trees	5
Shrubs	0
Grasses etc.	39.2
Forbs	0.4
Ferns	0
Other	0
Sum of Cover of native vascular plants by growth form group	
High Threat Weed cover	7.2

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 - 79 cm	0	
30 - 49 cm	0	
20 - 29 cm	0	
10 - 19 cm	0	
5 - 9 cm	0	
Regeneration < 5 cm	1	
Length of logs (m) (≥10 cm diameter, >50 cm in length)	0	

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)	7 4 5 5 6	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	5.4	0	0	0

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

Wildthing Environmental Consultants - Office # (02) 49513311

400 m ² plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders	
Date			4A		
GF	Species	Cover	Abund	voucher	
T	1 <i>Eucalyptus tereticornis</i>	5	98		
G	2 <i>Cymbopogon refractus</i>	3	100		
G	3 <i>Microlaena stipoides</i>	10	1000		
-	4 <i>Plantago lanceolata</i>	2	1000		
-	5 <i>Ceniza bonariensis</i>	0.3	50		
HTW	6 <i>Paspalum dilatatum</i>	4	500		
HTW	7 <i>Senecio madagascariensis</i>	1	200		
HTW	8 <i>Bidens pilosa</i>	0.2	50		
-	9 <i>Eragrostis cilianensis</i>	1	500		
F	10 <i>Hypericum graminifolium</i>	0.1	50		
G	11 <i>Cydonia latifolia</i>	25	3000		
F	12 <i>Oxalis perennans</i>	0.1	50		
-	13 <i>Cyperus brevifolius</i>	0.1	100		
-	14 <i>Setaria gracilis</i>	1	400		
G	15 <i>Fimbristylis dicoloma</i>	0.1	50		
-	16 <i>Hypochaeris radicata</i>	0.2	50		
G	17 <i>Sporobolus ciliaris</i>	0.5	30		
-	18 <i>Verbena bonariensis</i>	0.2	15		
HTW	19 <i>Axonopus fistulosus</i>	2	400		
-	20 <i>Tagetes minuta</i>	3	200		
-	21 <i>Chenopodium album</i>	0.1	2		
G	22 <i>Paspalidium distans</i>	0.5	100		
-	23 <i>Modiola carolina</i>	0.1	1		
F	24 <i>Wahlenbergia gracilis</i>	0.1	10		
F	25 <i>Asperula conferta</i>	0.1	20		
G	26 <i>Bothriochloa macro</i>	0.1	10		
-	27 <i>Gnaphalium spicatum</i>	0.3	50		
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Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site – Field Survey Form Plot Identifier: 5A

Midline start		Midline end		Plot Size	Date	Plot Waypoint ID		Recorders
E 365896 N 6373735		E 365848 N 6373250		20x50	9/7/2024	Start -	End -	DARYL NICOLA
IBRA region				SYDNEY BASIN				
Photo# 7613		Photo# 7610		Vegetation Class: Coastal Freshwater Lagoon				
Bearing 266°		Bearing 90°		Vegetation Zone: PCT 3975				
PCT # 3975		PCT Name: Southern Lower Floodplain Freshwater Wetland						
Consistent BC ACT TEC?								

BAM Attribute (400 m ² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	0
	Grasses etc.	3
	Forbs	1
	Ferns	0
	Other	0
Surface Cover of native vascular plants by growth form group	Shrubs	0
	Grasses etc.	95.1
	Forbs	0.2
	Ferns	0
	Other	0
High Threat Weed cover		4.7

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 - 79 cm	2	
30 - 49 cm	0	
20 - 29 cm	0	
10 - 19 cm	2	
5 - 9 cm	0	
Regeneration < 5 cm	0	
Length of logs (m) (>10 cm diameter, >50 cm in length)		0

Large Tree Sizes
 Dry Sclerophyll Forests - ≥250, Forested Wetlands - ≥250, Freshwater Wetlands - NA, Grasslands - NA, Grassy Woodlands - ≥250, Heathlands - ≥230, Rainforests - ≥250, Saline Wetlands - NA, Semi-arid Woodland (grassy sub-formation) ≥230, Semi-arid woodlands (shrubby sub-formation) ≥230, Wet sclerophyll forests (grassy sub-formation) ≥279, Wetland sclerophyll forests (shrubby sub-formation) ≥279

BAM Attribute (1 x 1 m plots)	Litter cover (%)	Bare ground cover (%)	Cryptogam cover (%)	Rock cover (%)
Subplot score (% in each)	20 30 10 90 10	00 00 00	00 00 00 00	00 00 00 00
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
 Cow pats
Crinia signifera calling within plot

Wildthing Environmental Consultants - Office # (02) 49513311

400 m ² plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	2/7/2009		5A	DARY NICOLA

GF		Species	Cover	Abund'	voucher
GG	1	<i>Cynodon dactylon</i>	90	5000	
GG	2	<i>Juncus uristatus</i>	5	70	
HTW	3	<i>Juncus acutus</i>	4	5	
HTW	4	<i>Sonchium medagascariensis</i>	0.5	30	
E	5	<i>Cirsium vulgare</i>	0.2	6	
HTW	6	<i>Rubus fruticosus</i>	0.1	1	
E	7	<i>Rumex crispus</i>	0.1	15	
E	8	<i>Plantago lanceolata</i>	0.1	20	
FG	9	<i>Ranunculus amphitrichus</i>	0.2	20	
E	10	<i>Cynoglosson procerum</i>	0.1	30	
E	11	<i>Trifolium repens</i>	0.1	10	
E	12	<i>Vicia sp.</i>	0.1	5	
E	13	<i>Conyza sp.</i>	0.1	5	
HTW	14	<i>Xanthium occidentale</i>	0.1	1	
E	15	<i>Bacopa mannieri</i>	0.1	3	
GG	16	<i>Carex longibrachilata</i>	0.1	2	
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Wildthing Environmental Consultants - Office # (02) 49513311

BAM Site - Field Survey Form Plot Identifier: 6A

Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders
E-365938 N-6373254	E-365887 N-6373256	20x50	9/7/2024	Start -	End -	DARIN NICOLA
IBRA region		SYDNEY BASIN				
Photo# #7579	Photo# #7580	Vegetation Class Hunter Macleay Dry Sclerophyll Forests				
Bearing 254°	Bearing 71°	Vegetation Zone PCT 3446 - Carex Dominant				
PCT # 3446	PCT Name Lower North Foothills Ironbark - Box - Gum - Grassy Forest					
Consistent BC ACT TEC?						

BAM Attribute (400 m ² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	0
	Grasses etc.	3
	Forbs	4
	Ferns	0
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	0
	Grasses etc.	51.5
	Forbs	1.3
	Ferns	0
High Threat Weed cover		1.6

BAM Attribute (1000 m ² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm	0	0
50 - 79 cm	0	
30 - 49 cm	0	
20 - 29 cm	0	
10 - 19 cm	0	
5 - 9 cm	0	
Regeneration < 5 cm	0	
Length of logs (m) (≥10 cm diameter, >50 cm in length)		0

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)	15 5 7 10 5	0 0 0 0 0	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
 Macropod scats Cow poats

Wildthing Environmental Consultants - Office # (02) 49513311

400 m ² plot: Sheet _ of _	Survey Name	Plot Identifier	Recorders
Date 9/7/2024		6A	DARYL NICOLA

GF	Species	Cover	Abund	voucher
GG	1 <i>Carex longibrachiolata</i>	45	200	
E	2 <i>Rumex crispus</i>	1	60	
GG	3 <i>Cynodon dactylon</i>	5	1000	
E	4 <i>Cirsium vulgare</i>	0.5	30	
HTW	5 <i>Senecio medegaiscanensis</i>	0.5	30	
E	6 <i>Plantago lanceolata</i>	1	200	
E	7 <i>Coryza bonariensis</i>	1	30	
FG	8 <i>Ranunculus amphitrichus</i>	0.5	100	
HTW	9 <i>Conchocarpus clandestinus</i>	0.5	200	
E	10 <i>Trifolium repens</i>	0.5	60	
FG	11 <i>Centella asiatica</i>	0.5	300	
E	12 <i>Verbena bonariensis</i>	0.2	15	
GG	13 <i>Juncus acutatus</i>	1.5	20	
E	14 <i>Taraxicum officinale</i>	0.1	2	
E	15 <i>Geranium solanderi</i>	0.1	15	
FG	16 <i>Labellia purpureascens</i>	0.2	100	
FG	17 <i>Paspalum dilatatum</i>	0.3	30	
HTW	18 <i>Axonopus fissifolius</i>	0.2	20	
HTW	19 <i>Oxalis corniculata</i>	0.1	50	
E	20 <i>Xanthium occidentale</i>	0.1	1	
HTW	21			
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Plate D13: Plot 1A-PCT 3444_Moderate Front Peg.



Plate D14: Plot 1A-PCT 3444_Moderate Back Peg.



Plate D15: Plot 1B-PCT 3444_Moderate Front Peg.



Plate D16: Plot 1B-PCT 3444_Moderate Back Peg.



Plate D17: Plot 2A-PCT 3444_Derived Grassland Front Peg.



Plate D18: Plot 2A-PCT 3444_Derived Grassland Back Peg.



Plate D19: Plot 2B-PCT 3444_Derived Grassland Front Peg.



Plate D20: Plot 2B-PCT 3444_Derived Grassland Back Peg.



Plate D21: Plot 3A-PCT 3328_Moderate Front Peg.



Plate D22: Plot 3A-PCT 3328_Moderate Back Peg.



Plate D23: Plot 4A-PCT 3328_Derived Grassland Front Peg.



Plate D24: Plot 4A-PCT 3328_Derived Grassland Back Peg.



Plate D25: Plot 5A-PCT 3975_Fair Front Peg.



Plate D26: Plot 5A-PCT 3975_Fair Back Peg.



Plate D27: Plot 6A-PCT 3446_Carex Dominant Front Peg.



Plate D28: Plot 6A-PCT 3446_Carex Dominant Back Peg.

Appendix E: Credit reports



BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00049614/BAAS23007/24/00049615	Wilton Drive_East Maitland	14/03/2024
Assessor Name	Report Created	BAM Data version *
Nicola Mohr	13/08/2024	67
Assessor Number	BAM Case Status	Date Finalised
BAAS23007	Finalised	13/08/2024
Assessment Revision	Assessment Type	BOS entry trigger
0	Part 4 Developments (General)	BOS Threshold: Area clearing threshold

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAIL	Ecosystem credits
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BAM Credit Summary Report

Lower Hunter Red Gum-Paperbark Riverflat Forest											
3	3328_Moderate	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	34.4	34.1	0.18	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	3
4	3328_Derived_grassland	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	24.6	23.3	0.3	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	3
										Subtotal	6
Lower Hunter Spotted Gum-Ironbark Forest											
1	3444_Moderate	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	41.5	41.3	0.69	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	14



BAM Credit Summary Report

2	3444_Derived_grassland	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	17.9	17.1	2.1	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	18
										Subtotal	32
Lower North Foothills Ironbark-Box-Gum Grassy Forest											
5	3446_Carex_dominant	Not a TEC	5.9	4.2	0.5	PCT Cleared - 75%	High Sensitivity to Gain			2.00	0
										Subtotal	0



BAM Credit Summary Report

Southern Lower Floodplain Freshwater Wetland											
6	3975_Fair	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	54.1	54.1	0.19	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00	5
										Subtotal	5
										Total	43

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAI	Species credits	
<i>Myotis macropus / Southern Myotis (Fauna)</i>										
3444_Moderate		41.3	41.3	0.31	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	6



BAM Credit Summary Report

3444_Derived_g rassland	17.1	17.1	1.9	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	16
3328_Moderate	34.1	34.1	0.18	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	3
3328_Derived_g rassland	23.3	23.3	0.3	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	3
3446_Carex_do minant	4.2	4.2	0.5	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	1
3975_Fair	54.1	54.1	0.19	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	5
								Subtotal	34
<i>Petaurus norfolcensis / Squirrel Glider (Fauna)</i>									
3444_Moderate	41.3	41.3	0.69	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	14



BAM Credit Summary Report

3328_Moderate	34.1	34.1	0.18	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	3
								Subtotal	17
<i>Pterostylis chaetophora / Pterostylis chaetophora (Flora)</i>									
3444_Moderate	41.3	41.3	0.69	Geographic Distribution	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	14
3328_Moderate	34.1	34.1	0.18	Geographic Distribution	Effectiveness of management in controlling threats	Vulnerable	Not Listed	False	3
								Subtotal	17



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00049614/BAAS23007/24/00049615	Wilton Drive_East Maitland	14/03/2024
Assessor Name	Assessor Number	BAM Data version #
Nicola Mohr	BAAS23007	67
Proponent Names	Report Created	BAM Case Status
	13/08/2024	Finalised
Assessment Revision	Assessment Type	Date Finalised
0	Part 4 Developments (General)	13/08/2024
BOS entry trigger	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
BOS Threshold: Area clearing threshold		

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		
Species		
Nil		

Additional Information for Approval

Assessment Id	Proposal Name	Page 1 of 7
00049614/BAAS23007/24/00049615	Wilton Drive_East Maitland	



BAM Biodiversity Credit Report (Like for like)

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT

No Changes

Predicted Threatened Species Not On Site

Name

No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Assessment Id
00049614/BAAS23007/24/00049615

Proposal Name
Wilton Drive_East Maitland

Page 2 of 7



BAM Biodiversity Credit Report (Like for like)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3444-Lower Hunter Spotted Gum-Ironbark Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	2.8	14	18	32
3328-Lower Hunter Red Gum-Paperbark Riverflat Forest	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	0.5	0	6	6
3446-Lower North Foothills Ironbark-Box-Gum Grassy Forest	Not a TEC	0.5	0	0	0
3975-Southern Lower Floodplain Freshwater Wetland	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.2	0	5	5

3328-Lower Hunter Red Gum-Paperbark Riverflat Forest - Like-for-like credit retirement options						
Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region	
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions This includes PCT's: 1603, 1605, 1691, 1692, 3328, 3446, 3634	-	3328_Moderate	No	3	3 Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	



BAM Biodiversity Credit Report (Like for like)

	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions This includes PCT's: 1603, 1605, 1691, 1692, 3328, 3446, 3634	-	3328_Derived_grassland	No	3 Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
3444-Lower Hunter Spotted Gum-Ironbark Forest	Like-for-like credit retirement options				
	Name of offset trading group	Trading group	Zone	HBT	Credits IBRA region
	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	-	3444_Moderate	Yes	14 Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.



BAM Biodiversity Credit Report (Like for like)

	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	-	3444_Derived_grassland	No	18 Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	
3446-Lower North Foothills Ironbark-Box-Gum Grassy Forest	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Hunter-Macleay Dry Sclerophyll Forests This includes PCT's: 3431, 3442, 3446	Hunter-Macleay Dry Sclerophyll Forests >=70% and <90%	3446_Carex_dominant	No	0	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.



BAM Biodiversity Credit Report (Like for like)

3975-Southern Lower Floodplain Freshwater Wetland	Like-for-like credit retirement options					
	Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 1738, 3958, 3959, 3962, 3964, 3965, 3967, 3971, 3973, 3975, 3976	-	3975_Fair	No		5 Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Myotis macropus / Southern Myotis	3444_Moderate, 3444_Derived_grassland, 3328_Moderate, 3328_Derived_grassland, 3446_Carex_dominant, 3975_Fair	3.3	34.00



BAM Biodiversity Credit Report (Like for like)

Petaurus norfolcensis / Squirrel Glider	3444_Moderate, 3328_Moderate	0.9	17.00
Pterostylis chaetophora / Pterostylis chaetophora	3444_Moderate, 3328_Moderate	0.9	17.00

Credit Retirement Options

Like-for-like credit retirement options

Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW
Petaurus norfolcensis / Squirrel Glider	Spp	IBRA subregion
	Petaurus norfolcensis / Squirrel Glider	Any in NSW
Pterostylis chaetophora / Pterostylis chaetophora	Spp	IBRA subregion
	Pterostylis chaetophora / Pterostylis chaetophora	Any in NSW



BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00049614/BAAS23007/24/00049615	Wilton Drive_East Maitland	14/03/2024
Assessor Name	Assessor Number	BAM Data version *
Nicola Mohr	BAAS23007	67
Proponent Name(s)	Report Created	BAM Case Status
	13/08/2024	Finalised
Assessment Revision	Assessment Type	Date Finalised
0	Part 4 Developments (General)	13/08/2024
BOS entry trigger	* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.	
BOS Threshold: Area clearing threshold		

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		
Species		
Nil		

Additional Information for Approval

PCT Outside Ibra Added
 None added

PCTs With Customized Benchmarks

Assessment Id	Proposal Name
00049614/BAAS23007/24/00049615	Wilton Drive_East Maitland



BAM Biodiversity Credit Report (Variations)

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
3444-Lower Hunter Spotted Gum-Ironbark Forest	Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions	2.8	14	18	32.00
3328-Lower Hunter Red Gum-Paperbark Riverflat Forest	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions	0.5	0	6	6.00
3446-Lower North Foothills Ironbark-Box-Gum Grassy Forest	Not a TEC	0.5	0	0	0.00
3975-Southern Lower Floodplain Freshwater Wetland	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.2	0	5	5.00

3328-Lower Hunter Red Gum-Paperbark Riverflat Forest	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region



BAM Biodiversity Credit Report (Variations)

	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions This includes PCT's: 1603, 1605, 1691, 1692, 3328, 3446, 3634	-	3328_Moderate	No	3	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions This includes PCT's: 1603, 1605, 1691, 1692, 3328, 3446, 3634	-	3328_Derived_grassland	No	3	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Variation options						
	Formation	Trading group	Zone	HBT	Credits	IBRA region
	Grassy Woodlands	Tier 3 or higher threat status	3328_Moderate	No	3	IBRA Region: Sydney Basin, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Grassy Woodlands	Tier 3 or higher threat status	3328_Derived_grassland	No	3	IBRA Region: Sydney Basin, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
3444-Lower Hunter Spotted Gum-Ironbark Forest	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region



BAM Biodiversity Credit Report (Variations)

Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	-	3444_Mod erate	Yes	14	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin and NSW North Coast Bioregions This includes PCT's: 3433, 3442, 3443, 3444, 4158	-	3444_Deriv ed_grassla nd	No	18	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Variation options					
Formation	Trading group	Zone	HBT	Credits	IBRA region
Dry Sclerophyll Forests (Shrub/grass sub-formation)	Tier 3 or higher threat status	3444_Mod erate	Yes (including artificial)	14	IBRA Region: Sydney Basin, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Dry Sclerophyll Forests (Shrub/grass sub-formation)	Tier 3 or higher threat status	3444_Deriv ed_grassla nd	No	18	IBRA Region: Sydney Basin, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.



BAM Biodiversity Credit Report (Variations)

3446-Lower North Foothills Ironbark-Box-Gum Grassy Forest	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Hunter-Macleay Dry Sclerophyll Forests This includes PCT's: 3431, 3442, 3446	Hunter-Macleay Dry Sclerophyll Forests >=70% and <90%	3446_Carex_dominant	No	0	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Variation options						
Formation	Trading group	Zone	HBT	Credits	IBRA region	
Dry Sclerophyll Forests (Shrub/grass sub-formation)	Tier 2 or higher threat status	3446_Carex_dominant	No	0	IBRA Region: Sydney Basin, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	
3975-Southern Lower Floodplain Freshwater Wetland	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region



BAM Biodiversity Credit Report (Variations)

	Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions This includes PCT's: 1738, 3958, 3959, 3962, 3964, 3965, 3967, 3971, 3973, 3975, 3976	-	3975_Fair	No	5	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Variation options					
	Formation	Trading group	Zone	HBT	Credits	IBRA region
Freshwater Wetlands	Tier 1	3975_Fair	No	5	IBRA Region: Sydney Basin, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Myotis macropus / Southern Myotis	3444_Moderate, 3444_Derived_grassland, 3328_Moderate, 3328_Derived_grassland, 3446_Carex_dominant, 3975_Fair	3.3	34.00
Petaurus norfolcensis / Squirrel Glider	3444_Moderate, 3328_Moderate	0.9	17.00
Pterostylis chaetophora / Pterostylis chaetophora	3444_Moderate, 3328_Moderate	0.9	17.00



BAM Biodiversity Credit Report (Variations)

Credit Retirement Options	Like-for-like options	
Myotis macropus/ Southern Myotis	Spp	IBRA region
	Myotis macropus/Southern Myotis	Any in NSW
	Variation options	
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below
Fauna	Vulnerable	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Petaurus norfolcensis/ Squirrel Glider	Spp	IBRA region
	Petaurus norfolcensis/Squirrel Glider	Any in NSW
	Variation options	
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below



BAM Biodiversity Credit Report (Variations)

	Fauna	Vulnerable	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Pterostylis chaetophora / Pterostylis chaetophora	Spp		IBRA region
	Pterostylis chaetophora /Pterostylis chaetophora		Any in NSW
	Variation options		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Flora	Vulnerable	Hunter, Ellerston, Karuah Manning, Kerrabee, Liverpool Range, Peel, Tomalla, Upper Hunter, Wyong and Yengo. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Appendix F: Total Flora List

Introduced species are indicated by an asterisk (“*”).

The following standard abbreviations are used to indicate subspecific taxa:

- subsp.** subspecies
- var.-** variety
- x -** 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 SAI

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.
- N** Weed of National Significance (WoNS)

Table F1 Total Flora List

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
CLASS FILICOPSIDA (Ferns)						
Dennstaedtiaceae						
<i>Pteridium esculentum</i>	Bracken					
Pteridaceae						
<i>Cheilanthes sieberi</i> ssp. <i>sieberi</i>	Mulga Fern					
MAGNOLIOPSIDA: Magnoliidae						
LILOPSIDA: (Monocotyledons)						
Anthericaceae						
<i>Caesia parviflora</i>	Pale Grass-lily					
<i>Tricoryne elatior</i>	Yellow Rush-lily					
Asparagaceae						
* <i>Asparagus aethiopicus</i>	Asparagus Fern					
Commelinaceae						
<i>Commelina cyanea</i>	Scurvy Weed					
Cyperaceae						
<i>Carex appressa</i>	Saw Sedge					
<i>Carex longebrachiata</i>						
* <i>Cyperus brevifolius</i>	Mullumbimby Couch					
<i>Cyperus difformis</i>	Dirty Dora					
* <i>Cyperus eragrostis</i>	Umbrella Sedge					
<i>Cyperus polystachyos</i>	Bunchy Sedge					
<i>Fimbristylis dichotoma</i>	Common Fringe Sedge					
<i>Lepidosperma laterale</i>	Sword Sedge					
Hydrocharitaceae						
<i>Ottelia ovalifolia</i>	Swamp Lily					
Hypoxidaceae						

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>Hypoxis hygrometrica</i>	Golden Weather-grass					
Iridaceae						
* <i>Romulea rosea</i> var. <i>australis</i>	Onion Grass					
Juncaceae						
* <i>Juncus cognatus</i>						
<i>Juncus usitatus</i>	Common Rush					
Lomandraceae						
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	Many-flowered Mat-rush					Sept
Luzuriagaceae						
<i>Eustrephus latifolius</i>	Wombat Berry					
<i>Geitonoplesium cymosum</i>	Scrambling Lily					
Phormiaceae						
<i>Dianella caerulea</i> var. <i>producta</i>	Blue Flax-lily					
<i>Dianella revoluta</i>	Blue Flax-lily					
Poaceae						
* <i>Andropogon virginicus</i>	Whisky Grass					
<i>Aristida vagans</i>	Three-awn Speargrass					
* <i>Avena fatua</i>	Wild Oats					
* <i>Axonopus fissifolius</i>	Narrow-leaved Carpet Grass					
<i>Bothriochloa macra</i>	Red Grass					
* <i>Briza maxima</i>	Quaking Grass					
* <i>Briza minor</i>	Shivery Grass					
* <i>Bromus catharticus</i>	Prairie Grass					
<i>Capillipedium spicigerum</i>	Scented Top					
* <i>Cenchrus clandestinus</i> syn <i>Pennisetum clandestinum</i>	Kikuyu					
* <i>Chloris gayana</i>	Rhodes Grass					
<i>Cynodon dactylon</i>	Common Couch					
<i>Cymbopogon refractus</i>	Barbed Wire Grass					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>Dichelachne micrantha</i>	Plume Grass					
<i>Digitaria parviflora</i>	Smallflower Fingergrass					
* <i>Echinochloa crus-galli</i>	Barnyard Grass					
<i>Echinopogon caespitosus</i> var. <i>caespitosus</i>	Hedgehog Grass					
* <i>Ehrharta erecta</i>	Panic Veldt Grass					
<i>Eragrostis brownii</i>	Browns Love Grass					
* <i>Eragrostis curvula</i>	African Lovegrass					
<i>Imperata cylindrica</i> var. <i>major</i>	Blady Grass					
* <i>Lolium perenne</i>	Perennial Ryegrass					
* <i>Megathyrsus maximus</i> syn. <i>Panicum maximum</i>	Guinea Grass					
* <i>Melinis repens</i>	Red Natal Grass					
<i>Microlaena stipoides</i> var. <i>stipoides</i>	Weeping Meadow Grass					
<i>Oplismenus imbecillis</i>	Basket Grass					
<i>Panicum effusum</i>	Hairy Panic					
* <i>Paspalum dilatatum</i>	Paspalum					
<i>Paspalum distichum</i>	Water Couch					
* <i>Paspalum urvillei</i>	Vasey Grass					
<i>Rytidosperma</i> sp.	Wallaby Grass					
* <i>Setaria parviflora</i> syn. <i>Setaria gracillis</i>	Slender Pigeon Grass					
* <i>Sporobolus africanus</i>	Parramatta Grass					
<i>Sporobolus creber</i>	Slender Rats Tail					
* <i>Stenotaphrum secundatum</i>	Buffalo Grass					
<i>Themeda australis</i>	Kangaroo Grass					Oct, Nov
Typhaceae						
<i>Typha orientalis</i>	Cumbungi					
MAGNOLIIDAE (Dicotyledons)						
Acanthaceae						
<i>Brunoniella australis</i>	Blue Trumpet					
<i>Pseuderanthemum variabile</i>	Pastel Flower					
Amaranthaceae						
* <i>Gomphrena celosioides</i>	Gomphrena Weed					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
Apiaceae						
<i>Centella asiatica</i>	Indian Pennywort					
* <i>Cyclospermum leptophyllum</i>	Slender Celery					
<i>Daucus glochidiatus</i>	Native Carrot					
* <i>Hydrocotyle bonariensis</i>	Kurnell Curse					
<i>Hydrocotyle sibthorpioides</i>						
Apocynaceae						
* <i>Gomphocarpus fruticosus</i>	Narrow-leaved Cottonbush					
<i>Parsonsia straminea</i> var. <i>straminea</i>	Common Silkpod				W?	
Asteraceae						
* <i>Ambrosia artemisiifolia</i>	Annual Ragweed					Noxious Weed
* <i>Aster subulatus</i> syn. <i>Aster squamatus</i>	Bushy Starwort					
* <i>Bidens pilosa</i>	Cobblers Pegs					
* <i>Cirsium vulgare</i>	Spear Thistle					Sept
* <i>Conyza bonariensis</i>	Flax-leaved Fleabane					
<i>Cotula australis</i>	Carrot Weed					
<i>Euchiton involucratus</i> syn. <i>Gnaphalium involucratum</i>	Cudweed					
<i>Euchiton sphaericus</i>	Common Cudweed					
* <i>Facelis retusa</i>	Facelis					
* <i>Gamochoaeta spicata</i>	Spiked Cudweed					
* <i>Hypochoaeris glabra</i>	Smooth Catsear					
* <i>Hypochoaeris radicata</i>	Catsear, Flatweed					
<i>Lagenophora stipitata</i> (syn. <i>Lagenifera stipitata</i>)	Blue Bottle-daisy					
* <i>Senecio madagascariensis</i>	Fireweed					Sept, Oct
* <i>Sonchus oleraceus</i>	Common Sow Thistle					
* <i>Tagetes minuta</i>	Stinking Roger					
* <i>Taraxacum officinale</i>	Dandelion					
<i>Vernonia cinerea</i> var. <i>cinerea</i>	Ironweed					
Bignoniaceae						
<i>Pandorea pandorana</i>	Wonga-wonga Vine					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
Brassicaceae						
<i>*Lepidium africanum</i>	Peppergrass					
Campanulaceae						
<i>Lobelia purpurascens</i>	White Root					
<i>Wahlenbergia communis</i>	Native Bluebell,					
<i>Wahlenbergia gracillis</i>	Sprawling Bluebell					
Caryophyllaceae						
<i>*Cerastium glomeratum</i>	Mouse Ear Chickweed					
<i>*Petrohragia nanteuillii</i>	Proliferous Pink					Sept, Oct
<i>*Polycarpon tetraphyllum</i>	Fourleaf Allseed					
<i>*Stellaria media</i>	Common Chickweed					Aug, Sept
Chenopodiaceae						
<i>Einadia hastata</i>	Berry Saltbush					
<i>Einadia nutans</i>	Nodding Saltbush					
Convolvulaceae						
<i>Convolvulus erubescens</i>	Australian Bindweed					
<i>Dichondra repens</i>	Kidney Weed					
Ericaceae						
<i>Leucopogon juniperinus</i>	Prickly Bearded Heath					July, Aug
Euphorbiaceae						
<i>*Euphorbia peplus</i>	Petty Spurge					
Fabaceae Subfamily (Faboideae)						
<i>Daviesia ulicifolia</i>	Gorse Bitter Pea					Aug
<i>Desmodium rhytidophyllum</i>	Tick-trefoil					
<i>Desmodium varians</i>	Slender Tick-trefoil					
<i>Glycine clandestina</i> subsp. complex	Love Creeper					Sept
<i>Hardenbergia violacea</i>	False Sarsaparilla					Aug, Sept
<i>*Medicago polymorpha</i>	Burr Medic					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>*Trifolium campestre</i>	Hop Clover					Sept, Oct
Fabaceae (Subfamily Mimosoideae)						
<i>Acacia falcata</i>	Falcata Wattle				W	
Gentianaceae						
<i>*Cenaurium erythraea</i>	Common Centaury					
Geraniaceae						
<i>Geranium homeanum</i>	Cranesbill					
<i>Geranium solanderi</i>	Native Geranium					
Goodeniaceae						
<i>Goodenia rotundifolia</i>						
Hypericaceae						
<i>Hypericum gramineum</i>	Native St John's Wort					
Loranthaceae						
<i>Dendrophthoe vitellina</i>	Apostle Mistletoe					Sept, Oct, Nov
Malvaceae						
<i>*Modiola carliniana</i>	Red-flowered Mallow					Sept
<i>*Sida rhombifolia</i>	Paddys Lucerne					
Myrtaceae						
<i>Angophora floribunda</i>	Rough-barked Apple					Nov, Dec
<i>Corymbia maculata</i>	Spotted Gum					
<i>Eucalyptus fibrosa</i> subsp. <i>fibrosa</i>	Broad-leaved Ironbark					
<i>Eucalyptus siderophloia</i>	Grey Ironbark					
<i>Eucalyptus tereticornis</i>	Forest Red Gum					Aug, Sept, Oct
Oleaceae						
<i>*Ligustrum sinense</i>	Small-leaved Privet					Sept

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
<i>Notelaea longifolia</i>	Mock Olive					
* <i>Olea europaea subsp. cuspidata</i>	African Olive					
Oxalidaceae						
* <i>Oxalis articulata</i>	Wood-sorrel					
<i>Oxalis perennans</i>	-					
Phyllanthaceae						
<i>Breynia oblongifolia</i>	Coffee Bush					
<i>Glochidion ferdinandi</i> var. <i>ferdinandi</i>	Cheese Tree					
Plantaginaceae						
* <i>Plantago lanceolata</i>	Plantain					
Polygonaceae						
<i>Persicaria decipens</i>	Slender Knotweed					
<i>Rumex brownii</i>	Swamp Dock					
* <i>Rumex crispus</i>	Curled Dock					
Portulacaceae						
<i>Portulaca oleracea</i>	Purslane, Pigweed					
Primulaceae						
* <i>Lysimachia arvensis</i> syn. <i>Anagallis arvensis</i>	Scarlet Pimpernel					
Ranunculaceae						
<i>Ranunculus lappaceus</i>	Common Buttercup					
Rubiaceae						
<i>Asperula conferta</i>	Common Woodruff					
<i>Pomax umbellata</i>	Pomax					
* <i>Richardia brasiliensis</i>	White Eye					
Solanaceae						
* <i>Cestrum parqui</i>	Green Cestrum					Sept, Oct

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SERIOUS AND IRREVERSIBLE IMPACT	REGIONALLY SIGNIFICANT	FLOWERING PERIOD
* <i>Solanum nigrum</i>	Blackberry Nightshade					
<i>Solanum prinophyllum</i>	Forest Nightshade					
Verbenaceae						
* <i>Lantana camara</i>	Lantana					Noxious
* <i>Verbena bonariensis</i>	Purple Top					
* <i>Verbena rigida</i> var. <i>rigida</i>	Veined Verbena					

Appendix G: Fauna Survey Results

Amphibians

Three frog species, *Crinia signifera* (Common Eastern Froglet), *Limnodynastes peronii* (Striped Marsh Frog), *Pseudophryne bibronii* (Brown Toadlet) and *Litoria fallax* (Dwarf Tree Frog) were recorded on site during the survey. Additional amphibians previously recorded within the site included *Litoria verreauxii* (Verreaux's Tree Frog) (Wildthing Environmental Consultants 2009)

No amphibian species listed as threatened under the BC Act 2016 or EPBC Act 1999 were recorded within the subject land.

Reptiles

Two species of reptile; *Lampropholis delicata* (Grass Skink) and *Pseudonaja textilis* (Brown Snake) were recorded during targeted and incidental surveys. The shell of a deceased *Chelodina longicollis* (Eastern Snake-necked Tortoise) was incidentally found within the study area. Additional reptiles previously recorded within the site included *Varanus varius* (Lace Monitor), *Carlia tetradactyla* (Southern Rainbow Skink) and *Pogona barbata* (Common Bearded Dragon) (Wildthing Environmental Consultants, 2009 & 2016).

No reptile species listed as threatened under the BC Act 2016 or EPBC Act 1999 were recorded within the subject land.

Avifauna

A number of avifauna species were found to be present across the various habitats of the site. Common birds recorded within the subject lands included *Rhipidura albiscapa* (Grey Fantail), *Manorina melanocephala* (Noisy Miner), *Philemon corniculatus* (Noisy Friarbird), *Platycercus eximius* (Eastern Rosella), *Trichoglossus haematodus* (Rainbow Lorikeet), *Cacatua galerita* (Sulphur-crested Cockatoo), *Cracticus tibicen* (Australian Magpie), *Corvus coronoides* (Australian Raven), *Threskiornis molucca* (Australian Ibis), *Egretta novaehollandiae* (White-faced Heron), *Vanellus miles* (Masked Lapwing), *Chenonetta jubata* (Australia Wood Duck) and *Hirundo neoxena* (Welcome Swallow).

Arboreal camera traps captured photos of *Dacelo novaeguineae* (Laughing Kookaburra), *Corvus coronoides* (Australian Raven)

Pairs of *Trichoglossus haematodus* (Rainbow Lorikeet), *Trichoglossus chlorolepidotus* (Scaly-breasted Lorikeet) and *Platycercus eximius* (Eastern Rosella) have been observed using hollows within habitat trees in the west and centre of the subject land (Trees No. 2, 3 and 26).

Birds of prey observed included *Falco cenchroides* (Nankeen Kestrel), *Falco longipennis* (Australian Hobby), *Haliastur sphenurus* (Whistling Kite), *Haliaeetus leucogaster* (White-bellied Sea-Eagle) and

Aquila audax (Wedge-tailed Eagle). *Falco longipennis* has been observed nesting in the west of the subject land (Peak Land Management, 2019).

Dual credit species *Haliaeetus leucogaster* (White-bellied Sea-Eagle) was observed overhead during field surveys however no large stick nests were found during significant tree surveys. This species has therefore only been offset as an ecosystem credit species.

BC Act listed threatened species *Daphoenositta chrysoptera* (Varied Sittella) and *Petroica phoenicea* (Flame Robin) have been previously recorded within the subject land (Peak Land Management, 2019). These species have been recorded as ecosystem credit species.

All birds observed within the study area are listed in Appendix H.

Nocturnal Avifauna

Ninox boobook (Southern Boobook) was commonly heard calling during nocturnal surveys and observed on multiple occasions in the eastern portion of the study area during diurnal surveys. *Podargus strigoides* (Tawny Frogmouth) was also observed from within the study area and on an arboreal camera trap. Specimens of *Tyto alba* (Barn Owl) were observed within two hollow-bearing trees within the far west of the subject land (Trees No. 2, 3 & 4 – Appendix I). During surveys in 2021 it was noted that here had likely been a recent breeding (nesting event) of *T. alba* within one of these large trees.

There were no responses as a result of the threatened owl calls played during the survey.



Plate G1 *Tyto alba* (Barn Owl) within tree far west subject land (24 March 2024)

Arboreal Mammals

During stagwatching surveys one species; *Trichosurus vulpecula* (Common Brushtail Possum) was observed on a number of occasions exiting habitat trees.

During spotlighting many specimens of native species *Trichosurus vulpecula* (Common Brushtail Possum), were recorded.

Camera trapping surveys captured photos native species *Trichosurus vulpecula* (Common Brushtail Possum) and *Petaurus breviceps* (Sugar Glider). A larger glider specimen with a bushy tail was also captured on camera. This individual could not confidently be identified as threatened species *Petaurus norfolcensis* (Squirrel Glider) but could also not be ruled out as a potential specimen (see Plates G2 & G3). The precautionary principal has been applied for assessment of this species in this report and it has been assumed present. Introduced species *Rattus rattus* (Black Rat) was also captured on arboreal camera traps. Photos results of the arboreal camera trapping surveys are presented in Plates G1-5.

Arboreal Mammal Trapping surveys (Wildthing Environmental Consultants, 2009 & 2016) conducted within the study area have only captured two species; *Petaurus breviceps* (Sugar Glider) and

Trichosurus vulpecula (Common Brushtail Possum). Trapping surveys were largely undertaken within the eastern portion of the study area.

Species credit species Squirrel Glider has been recorded under the precautionary principal.

Terrestrial Mammals

A relatively large number of *Macropus giganteus* (Eastern Grey Kangaroo) were observed using and moving through the study area during diurnal and nocturnal surveys. The introduced *Vulpes vulpes* (European Red Fox) was also observed on a number of occasions during camera trapping and spotlighting.

One specimen of *Notamacropus rufogriseus* (Red-necked Wallaby) was recorded during ground camera trapping. The introduced *Vulpes vulpes* (European Red Fox) and *Lepus europaeus* (European Hare) were also recorded during ground camera trapping. Photos results of terrestrial camera trapping surveys are presented in Plates G6, G7 & G8.

The introduced *Rattus rattus* (Black Rat) was the only species captured during small and medium terrestrial mammal trapping. Trapping surveys were largely undertaken within the eastern portion of the study area.

With the exception of Lot 8, *Bos taurus* (Cattle) were present over most of the study area during most surveys.

Microchiropteran Bats

During the harp trapping component of the survey one species of microchiropteran bat; *Vespadelus vulturnus* (Little Forest Bat) was captured within the rezoning area. Previous harp trapping within the site (Wildthing Environmental Consultants, 2009) captured specimens of *Nyctophilus geoffroyi* (Lesser Long-eared Bat).

No ecosystem or species credit species were recorded during the harp trapping or previous harp trapping conducted within the subject land.

Four species, *Chalinolobus gouldii* (Gould's Wattled Bat), *Vespadelus vulturnus* (Little Forest Bat), *Miniopterus orianae oceanensis* (Eastern Bentwing-bat) and *Austronomus australis* (White-striped Freetail Bat) were positively identified during the bat call survey. Likely calls from *Myotis macropus* (Eastern Myotis) were also recorded. Other calls were only identified to genus level, being *Nyctophilus* sp. Calls attributed to the genus *Nyctophilus* sp. were thought to be from either from *N. gouldi* (Gould's Long-eared Bat) or *N. geoffroyi* (Lesser Long-eared Bat).

Additional species recorded during previous surveys within the subject land included *Falsistrellus tasmaniensis* (Eastern Falsistrelle), *Miniopterus australis* (Little Bentwing-bat) and *Micronomus norfolkensis* (Eastern Freetail Bat) (Wildthing Environmental Consultants, 2009 & 2015).

The following threatened species have been recorded within the study area:

- *Falsistrellus tasmaniensis* (Eastern Falsistrelle);
- *Miniopterus australis* (Little Bentwing-bat);
- *Micronomus norfolkensis* (Eastern Freetail Bat);
- *Miniopterus orianae oceanensis* (Eastern Bentwing-bat);
- *Myotis macropus* (Eastern Myotis).

Falsistrellus tasmaniensis (Eastern Falsistrelle), *Miniopterus australis* (Little Bentwing-bat) (no breeding habitat), *Micronomus norfolkensis* (Eastern Freetail Bat), *Miniopterus orianae oceanensis* (Eastern Bentwing-bat) (no breeding habitat) were recorded ecosystem credit species.

One species credit species *Myotis macropus* (Eastern Myotis) was recorded.

Koala Spot Assessment Technique

Survey results have been presented in Tables G2, G3 and G4. No Koala scats or evidence of koalas was observed. Results of the assessment are presented below:

Table G1. Categorisation of Koala activity into Low, Medium (normal) and High use categories based on use of mean activity level \pm 99 per cent confidence intervals (nearest percentage equivalents) from each of the three area/population density categories.

Activity category	Low use	Medium (normal) use	High use
Area (density)			
East Coast (low)		$\geq 3.33\%$ but $\leq 12.59\%$	$> 12.59\%$
East Coast (med – high)	$< 22.52\%$	22.52% but $\leq 32.84\%$	$> 32.84\%$
Western Plains (med – high)	$< 35.84\%$	$\geq 35.84\%$ but $\leq 46.72\%$	$> 46.72\%$

The activity level for a SAT site is simply expressed as the percentage equivalent of the proportion of surveyed trees within the site that had Koala faecal pellet recorded within the prescribed search area. Given a sample of 90 trees with no Koala scats present, the activity category would be 0. The categorisation of Koala activity is shown in Table G6. Considering that no Koala Pellets were recorded, Koala usage would be likely very low at the time of survey. This low activity may be associated with a low-density Koala population.

INCIDENTIAL OBSERVATIONS AND SECONDARY INDICATIONS

A number of incidental observations and secondary indications of fauna were observed during the survey and included:

- Scats and footprints consistent with that of a macropod were found to be common throughout the site. These scats and prints were most likely from *Macropus giganteus* (Eastern Grey Kangaroo) which was observed frequently and recorded during the camera trapping survey;



Plate G2 *Petaurus breviceps* (Sugar Glider) observed on camera trap



Plate G3 Larger glider specimen observed on camera trap



Plate G4 Tail of larger glider *Petaurus* sp. specimen tail observed on camera trap



Plate G5 *Trichosurus vulpecula* (Common Brushtail Possum) observed on camera trap



ENDURO

072F 22°C 19/02/2022 01:20:22

Plate G6 *Podargus strigoides* (Tawny Frogmouth) observed on camera trap



ENDURO

074F 23°C 30/01/2016 13:55:54

Plate G7 *Macropus giganteus* (Eastern Grey Kangaroo) and joey observed on camera trap (2021 - note camera date is incorrect)



SWING
ENCLOSURE

047F 08C 14/02/2016 04:24:29

Plate G8 *Notamacropus rufogriseus* (Red-necked Wallaby) observed on camera trap (2021 - note camera date is incorrect)



2021-02-25 18:58:56

M 3/3

21°C

HYPERFIRE 2 COVERT

BECONIX

Plate G9 *Vulpes vulpes* (European Red Fox) observed on camera trap

Table G2: Results of the Spot Assessment Technique (SAT) #1.

SAT Tree No	Easting	Northing	DBH	Height	Tree species	Result
1	366087	6373322	0.6	18	<i>E. tereticornis</i>	Macropod scats
2	366087	6373321	0.29	7	<i>E. tereticornis</i>	Macropod scats
3	366083	6373328	0.58	14	<i>E. tereticornis</i>	
4	366080	6373322	0.23, 0.27, 0.32	10	<i>E. tereticornis</i>	Brush-tail possum scats and macropod scats
5	366079	6373318	0.26, 0.36	12	<i>E. tereticornis</i>	Cow pat and macropod scat
6	366082	6373313	0.31, 0.37	14	<i>E. tereticornis</i>	Macropod scats
7	366088	6373313	0.52	16	<i>E. tereticornis</i>	Bird white wash and cow pat
8	366092	6373320	0.28, 0.33	14	<i>E. tereticornis</i>	Macropod scats
9	366094	6373319	0.42, 0.47	14	<i>E. tereticornis</i>	Macropod scats
10	366097	6373318	0.5	14	<i>E. tereticornis</i>	Cow pat and macropod scat
11	366086	6373332	0.27	9	<i>E. tereticornis</i>	Cow pat and macropod scat
12	366087	6373333	0.44	11	<i>E. tereticornis</i>	Cow pat and macropod scat
13	366092	6373332	0.67	14	<i>E. tereticornis</i>	Cow pat and macropod scat
14	366073	6373333	0.88	16	<i>E. tereticornis</i>	Cow pat
15	366072	6373320	0.56	14	<i>E. tereticornis</i>	Macropod scats
16	366071	6373321	0.32	4	<i>E. tereticornis</i>	Macropod scats
17	366073	6373317	0.21, 0.46	13	<i>E. tereticornis</i>	Macropod scats
18	366078	6373311	0.21	7	<i>E. tereticornis</i>	Macropod scats
19	366081	6373309	0.29, 0.51	10	<i>E. tereticornis</i>	Macropod scratches on trunk
20	366072	6373310	0.36, 0.41, 0.45	11	<i>E. tereticornis</i>	Cow pat and macropod scat
21	366053	6373299	0.85	16	<i>E. tereticornis</i>	Macropod scats
22	366066	6373289	0.35	9	<i>E. tereticornis</i>	Macropod scats
23	366072	6373289	0.36, 0.56	10	<i>E. tereticornis</i>	Macropod scats
24	366070	6373285	0.68	18	<i>E. tereticornis</i>	Macropod scats
25	366062	6373285	0.95	18	<i>E. tereticornis</i>	Macropod scats
26	366062	6373282	0.61	14	<i>E. tereticornis</i>	Trunk mainly dead
27	366107	6373272	0.12, 0.13	1.5	<i>E. tereticornis</i>	Macropod scats
28	366125	6373267	0.83	13	<i>E. tereticornis</i>	Cow pat and duck scat
29	366137	6373262	0.14	5	<i>E. tereticornis</i>	Macropod scats
30	366133	6373286	0.22, 0.26	6	<i>E. tereticornis</i>	Macropod and duck scats

Table G3: Results of the Spot Assessment Technique (SAT) #2 survey.

SAT Tree No	Easting	Northing	DBH	Height	Tree species	Result
1	366202	6373418	0.55	13	<i>C. maculata</i>	Cow pats, macropod scats, brushtail possum scats
2	366202	6373419	0.49	12	<i>C. maculata</i>	Bird white wash and macropod scats
3	366207	6373415	0.64	14	<i>C. maculata</i>	Scratches on trunk. Macropod scats
4	366202	6373425	0.58	17	<i>C. maculata</i>	Macropod scats
5	366204	6373429	0.5	14	<i>C. maculata</i>	Cow pats
6	366208	6373428	0.44	10	<i>C. maculata</i>	Scratches on trunk. Macropod scats and small brushtail possum scats
7	366201	6373426	0.28	9	<i>C. maculata</i>	Scratches on trunk, likely brushtail possum. Macropod scats and cow pats
8	366199	6373435	0.88	20	<i>E. siderophloia</i>	Brushtail possum scats, macropod scats and cow pats
9	366195	6373423	0.52	14	<i>C. maculata</i>	Macropod scats
10	366191	6373424	0.45	16	<i>C. maculata</i>	Brushtail possum scats, macropod scats and cow pats
11	366190	6373426	0.39	14	<i>C. maculata</i>	Macropod scats and cow pats
12	366188	6373422	0.47	16	<i>C. maculata</i>	Macropod scats and cow pats
13	366185	6373435	0.44	13	<i>C. maculata</i>	Macropod scats and cow pats
14	366172	6373438	1.2	18	<i>C. maculata</i>	Brushtail possum scats, macropod scats and cow pats
15	366165	6373459	0.18, 0.21	6	<i>C. maculata</i>	
16	366197	6373472	0.84	20	<i>C. maculata</i>	
17	366240	6373449	0.27	7	<i>C. maculata</i>	Brushtail possum scratches on trunk and scats
18	366244	6373447	0.34	9	<i>C. maculata</i>	Brushtail possum scats
19	366257	6373444	0.46	16	<i>C. maculata</i>	Macropod scats
20	366261	6373440	0.69	16	<i>C. maculata</i>	Macropod scats and cow pats
21	366264	6373436	0.8	16	<i>C. maculata</i>	Macropod scats
22	366271	6373403	0.16	5	<i>E. siderophloia</i>	
23	366271	6373403	0.17	5	<i>E. siderophloia</i>	
24	366272	6373403	0.6	10	<i>A. floribunda</i>	Brushtail possum scats, macropod scats and cow pats
25	366211	6373372	0.38	8	<i>A. floribunda</i>	Macropod scats
26	366211	6373372	0.37	9	<i>A. floribunda</i>	Macropod scats
27	366208	6373371	0.16, 0.29	10	<i>A. floribunda</i>	Macropod scats
28	366209	6373373	0.38	9	<i>A. floribunda</i>	Macropod scats
29	366209	6373371	0.2	6	<i>A. floribunda</i>	Macropod scats
30	366208	6373364	0.38	8	<i>A. floribunda</i>	Brushtail possum and macropod scats

Table G4: Results of the Spot Assessment Technique (SAT) #3 survey.

SAT Tree No	Easting	Northing	DBH	Height	Tree species	Result
1	366368	6373395	0.8	20	<i>E. tereticornis</i>	Brushtail possum scats
2	366377	6373400	0.19, 0.63	21	<i>E. tereticornis</i>	
3	366371	6373397	0.51	13	<i>E. globoidea</i>	
4	366363	6373390	0.42, 0.34	10	<i>E. globoidea</i>	Brushtail possum scats
5	366361	6373389	0.14	4	<i>E. siderophloia</i>	
6	366371	6373385	0.27	13	<i>E. tereticornis</i>	
7	366368	6373383	0.15	6	<i>C. maculata</i>	
8	366373	6373384	0.22	8	<i>E. globoidea</i>	Brushtail possum and macropod scats
9	366373	6373381	0.38	15	<i>E. globoidea</i>	Brushtail possum and macropod scats
10	366366	6373375	0.17, 0.34	10	<i>E. siderophloia</i>	Cow pats and macropod scats
11	366360	6373378	0.31	15	<i>C. maculata</i>	Brushtail possum scratches on trunk and macropod scats
12	366362	6373381	0.14, 0.38	17	<i>C. maculata</i>	Macropod scats
13	366353	6373385	0.4	18	<i>E. tereticornis</i>	Brushtail possum and macropod scats
14	366349	6373376	0.32	17	<i>C. maculata</i>	Brushtail possum scratches on trunk and macropod scats
15	366348	6373377	0.38	16	<i>E. siderophloia</i>	
16	366348	6373380	0.11	4	<i>C. maculata</i>	Scratches on trunk and macropod scats
17	366347	6373386	0.31	15	<i>E. siderophloia</i>	Macropod scats
18	366353	6373386	0.22	7	<i>C. maculata</i>	Macropod scats
19	366349	6373387	0.32	16	<i>E. tereticornis</i>	Brushtail possum scats
20	366343	6373393	0.2	7	<i>E. siderophloia</i>	
21	366352	6373389	0.16	10	<i>E. tereticornis</i>	Macropod scats
22	366351	6373391	0.15	5	<i>E. tereticornis</i>	Cow pats
23	366358	6373400	0.35	14	<i>E. tereticornis</i>	
24	366362	6373401	0.25	13	<i>E. tereticornis</i>	Fine scratches on trunk
25	366372	6373422	0.32	16	<i>C. maculata</i>	Macropod scats
26	366383	6373424	0.69	20	<i>E. tereticornis</i>	Scratches on trunk. Brushtail possum scats and cow pats
27	366388	6373420	0.47	14	<i>E. punctata</i>	
28	366393	6373423	0.44	20	<i>C. maculata</i>	Fine scratches on trunk
29	366393	6373397	0.61	13	<i>E. globoidea</i>	Macropod scats
30	366386	6373390	0.59	17	<i>E. tereticornis</i>	

Figure G1 Koala Spot Assessment Technique Survey Trees



Job Ref	12503
A4 Scale	1:3,500

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 portrayed 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.

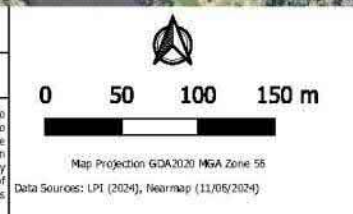


Figure G1
**Koala Spot Assessment Technique (SAT)
 Survey Locations**
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
 23 July 2024

WILDTHING
 Environmental Consultants
 (a Division of Tattersall Lander Pty Ltd)
 ABN 41 003 509 215

Appendix H: Total Vertebrate Fauna List

VERTEBRATE FAUNA LIST

Family sequencing and taxonomy follow for each fauna class:

Fish

Allen, G.R., Midgley, S.H. & Allen, M. (2002). *Field Guide to the Freshwater Fishes of Australia*. Western Australian Museum, Perth.

Herpetofauna

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

Birds

Pizzey and Knight (2012) (9th edn).

Mammals

Van Dyck, S. and Strahan, R. (Ed) (2008). *The Mammals of Australia* (3rd edn). New Holland Publishers, Australia – Churchill, S. (2008). *Australian Bats*. (2nd edn.). Allen & Unwin Australia.

(?) - Indicates a species identified without certainty or to a Genus level only.

* - Indicates an introduced species.

Threatened species addressed within this assessment appear in **bold** font.

Introduced species are indicated by an asterisk (“*”).

The following standard abbreviations are used to indicate subspecific taxa:

subsp. -subspecies

var.- variety

x - hybrid between the two indicated species

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 Population**

M **Migratory**

Regionally Significant Fauna Species.

+ Region includes Gosford, Wyong, Cessnock, Maitland, Lake Macquarie, Newcastle and Port Stephens LGA's. Produced from Stage 1 of the LHCCREMS – Regional Biodiversity Conservation Strategy.

Observation Type

O - Observed (sighted)

W - Heard call

OW – Observed and heard call

X - In scat

P – Scat

T - Trapped or netted

H – Hair, feathers or skin

A - Stranded/Beached

G – Crushed cones

R – Road Kill

D – Dog Kill

Q – Camera

C – Cat Kill

V – Fox Kill

K – Dead

S – Shot

I – Fossil/subfossil

FB – Burrow

F – Tracks, scratching

Z – In raptor/owl Pellet

U – Ultrasonic recording

M - Miscellaneous

E – Nest/roost

B - Burnt

Y – Bones, teeth or shell

N – Not located

AR – Acoustic Recording

Table H1 Total Vertebrate Fauna List

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Phylum - Chordata					
Subphylum - Vertebrata					
Class Amphibia - Amphibians					
Order Salientia - Frogs					
Family Myobatrachidae - 'Southern Frogs'					
<i>Crinia signifera</i>	Common Eastern Froglet				W ²⁰²⁴ 2021, 2016, 2009
<i>Limnodynastes peronii</i>	Striped Marsh Frog				O ²⁰²¹ , 2016, 2009
<i>Pseudophryne bibronii</i>	Brown Toadlet			+	W ²⁰²¹
Family Hylidae - Tree Frogs					
<i>Litoria fallax</i>	Eastern Dwarf Tree Frog				O ²⁰²¹ , 2016, 2009
<i>Litoria peronii</i>	Peron's Tree Frog				O ²⁰²¹
<i>Litoria verreauxii verreauxii</i>	Verreaux's Tree Frog			+	W ²⁰⁰⁹
Class Reptilia - Reptiles					
Family Chelidae - Tortoises					
<i>Chelodina longicollis</i>	Eastern Snake-necked Tortoise				K ²⁰²⁴
Order Squamata – Lizards and Snakes					
Suborder Sauria - Lizards					
Family Agamidae - Dragons					
<i>Pogona barbata</i>	Eastern Bearded Dragon			+	O ²⁰⁰⁹

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Family Varanidae - Monitors					
<i>Varanus varius</i>	Lace Monitor				○ ²⁰⁰⁹
Family Scinidae - Skinks					
<i>Carlia tetradactyla</i>	Rainbow Skink			+	○ ²⁰⁰⁹
<i>Cryptoblepharus pulcher</i>	Fence Skink, Wall Skink				○ ²⁰⁰⁹
<i>Lampropholis delicata</i>	Grass Skink				○ ^{2024, 2016, 2009}
Suborder Serpentes - Snakes					
Family Elapidae - Venomous Snakes					
<i>Pseudonaja textilis</i>	Eastern Brown Snake			+	○ ²⁰²¹
Class Aves - Birds					
Family Phasianidae					
<i>Coturnix pectoralis</i>	Stubble Quail				○ ²⁰²¹
Family Anatidae - Ducks, Swans and Geese					
<i>Anas castanea</i>	Chestnut Teal				○ ²⁰¹⁶
<i>Anas superciliosa</i>	Pacific Black Duck				○ ^{2016, 2009}
<i>Chenonetta jubata</i>	Australian Wood Duck				○ ^{2024, 2016, 2009}
Family Columbidae - Pigeons, Doves					
<i>Ocyphaps lophotes</i>	Crested Pigeon				○ ²⁰⁰⁹
Family Phalacrocoridae - Cormorants					
<i>Phalacrocorax fuscescens</i>	Pied Cormorant				○ ²⁰⁰⁹
<i>Phalacrocorax sulcirostris</i>	Little Black Cormorant				○ ²⁰¹⁶
Family Podargidae - Frogmouths					
<i>Podargus strigoides</i>	Tawny Frogmouth				○ ^{2024, 2021}

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Family Ardeidae - Herons, Egrets and Bitterns					
<i>Ardea alba</i>	Great Egret				○ ²⁰²¹
<i>Ardea ibis</i>	Cattle Egret		M		○ ²⁰²¹
<i>Egretta novaehollandiae</i>	White-faced Heron				○ ^{2021, 2016, 2009}
Family Threskiornithidae - Ibises and Spoonbills					
<i>Threskiornis molucca</i>	Australian White Ibis (Sacred Ibis)				○ ^{2024, 2021, 2016, 2009}
<i>Threskiornis spinicollis</i>	Straw-necked Ibis				○ ^{2024, 2021, 2016}
<i>Platalea regia</i>	Royal Spoonbill				○ ²⁰²⁴
Family Accipitridae - Osprey, Hawks, Eagles and Harriers					
<i>Aquila audax</i>	Wedge-tailed Eagle				○ ^{2024, 2021}
<i>Aviceda subcristata</i>	Pacific Baza				○ ²⁰²⁴
<i>Elanus axillaris</i>	Black-shouldered Kite				○ ^{2024, 2021}
<i>Haliastur sphenurus</i>	Whistling Kite				○W ^{2021, 2016}
<i>Milvus migrans</i>	Black Kite				○ ²⁰²¹
Family Falconidae - Falcons					
<i>Falco cenchroides</i>	Nankeen Kestrel				○ ^{2024, 2021, 2016, 2009}
<i>Falco longipennis</i>	Australian Hobby				○ ²⁰²¹
Family Rallidae					
<i>Fulica atra</i>	Eurasian Coot				○ ^{2024, 2021}
<i>Gallinula tenebrosa</i>	Dusky Moorhen				○ ^{2024, 2021, 2016}
Family – Recurvirostridae – Slits & Avocets					
<i>Himantopus himantopus</i>	Black-winged Stilt				○ ²⁰⁰⁹

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Family Charadriidae Plover, Dotterels, Lapwings					
<i>Elseyornis melanops</i>	Black-fronted Dotterel				O ^{2016, 2009}
<i>Vanellus miles</i>	Masked Lapwing				OW ^{2021, 2016, 2009}
Family Cacatuidae - Cockatoos and Corellas					
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo				OW ^{2024, 2021, 2016, 2009}
<i>Cacatua roseicapilla</i>	Galah				OW ^{2024, 2021, 2016, 2009}
<i>Cacatua sanguinea</i>	Little Corella				OW ^{2024, 2021, 2016, 2009}
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo			+	OW ^{2024, 2021, 2016, 2009}
Family Psittacidae - Parrots, Rosellas and Lorikeets					
<i>Alisterus scapularis</i>	King Parrot				O ^{2024, 2021, 2009}
<i>Platycercus eximius</i>	Eastern Rosella				OW ^{2024, 2021, 2016, 2009}
<i>Psephotus haematonotus</i>	Red-rumped Parrot				OW ^{2024, 2021, 2009}
<i>Trichoglossus chlorolepidotus</i>	Scaly-breasted Lorikeet				OW ^{2024, 2021, 2009}
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet				OW ^{2024, 2021, 2016, 2009}
Family Cuculidae - Cuckoos					
<i>Eudynamys orientalis</i>	Common Koel				W ²⁰²¹
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo				W ^{2021, 2009}
Family Strigidae - Hawk-Owls					
<i>Ninox novaeseelandiae</i>	Southern Boobook				OW ^{2024, 2021,}
Family Tytonidae - Barn Owls					
<i>Tyto alba</i>	Barn Owl			+	OW ^{2024, 2021}
Family Halcyonidae - Tree Kingfishers					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
<i>Dacelo novaeguineae</i>	Laughing Kookaburra				OW ^{2024, 2021, 2016, 2009}
<i>Todiramphus sanctus</i>	Sacred Kingfisher				OW ^{2021, 2009}
Family Coraciidae - Rollers 'Dollarbirds					
<i>Eurystomus orientalis</i>	Dollarbird				OW ^{2024, 2021, 2009}
Family Maluridae					
<i>Malurus cyaneus</i>	Superb Fairy-wren				OW ^{2024, 2021, 2009}
Family Pardalotidae - Pardalotes, Gerygones, Scrubwrens, Heathwrens and Thornbills					
<i>Acanthiza nana</i>	Yellow Thornbill				O ²⁰⁰⁹
<i>Acanthiza pusilla</i>	Brown Thornbill				W ²⁰²¹
<i>Gerygone olivacea</i>	White-throated Gerygone				OW ^{2016, 2009}
<i>Pardalotus punctatus</i>	Spotted Pardalote				W ^{2024, 2021, 2016, 2009}
<i>Chthonicola sagittata</i>	Speckled Warbler	V			O (Peak Land Management 2019)
Family Meliphagidae - Honeyeaters					
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill				OW ^{2016, 2009}
<i>Caligavis chrysops</i>	Yellow-faced Honeyeater				OW ^{2024, 2016, 2009}
<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater				OW ²⁰²⁴
<i>Manorina melanocephala</i>	Noisy Miner				OW ^{2024, 2021, 2016, 2009}
<i>Philemon corniculatus</i>	Noisy Friarbird				OW ^{2024, 2021, 2009}
Family Petroicidae - Robins and Jacky Winter					
<i>Eopsaltria australis</i>	Eastern Yellow Robin				O ²⁰⁰⁹
<i>Microeca fascinans</i>	Jacky Winter				O ²⁰⁰⁹
<i>Petroica phoenicea</i>	Flame Robin	V			O (Peak Land Management 2019)
Family Pachycephalidae - Whistlers,					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Shrike-tit and Shrike-thrushes <i>Pachycephala pectoralis</i>	Golden Whistler				OW ^{2016, 2009}
Family Monarchidae - Monarchs, Flycatchers and Magpie-Lark <i>Grallina cyanoleuca</i>	Magpie-lark				OW ^{2016, 2009}
Family Rhipiduridae - Fantails <i>Rhipidura fuliginosa</i> <i>Rhipidura leucophrys</i>	Grey Fantail Willie Wagtail				OW ^{2016, 2009} OW ^{2024, 2016, 2009}
Family Campephagidae - Cuckoo-shrikes and Trillers <i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike				OW ²⁰²⁴
Family Hirundinidae - Swallows and Martins <i>Hirundo neoxena</i>	Welcome Swallow				OW ^{2021, 2016, 2009}
Family Sylviidae - Old World Warblers <i>Acrocephalus stentoreus</i> <i>Cisticola exilis</i>	Clamorous Reed Warbler Golden-headed Cisticola				OW ^{2016, 2009} OW ^{2016, 2009}
Family Zosteropidae - White-eyes <i>Zosterops lateralis</i>	Silvereye				OW ²⁰²¹
Family Artamidae - Wood-swallows, Butcherbirds, Magpie and Currawongs <i>Cracticus nigrogularis</i> <i>Cracticus tibicen</i> syn. <i>Gymnorhina tibicen</i> <i>Strepera graculina</i>	Pied Butcherbird Australian Magpie Pied Currawong				OW ^{2024, 2021, 2016, 2009} OW ^{2024, 2021, 2016, 2009} W ^{2024, 2021, 2009}

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Family Corvidae - Crows, Raven					
<i>Corvus coronoides</i>	Australian Raven				OW ^{2024, 2021, 2016, 2009}
Corcoracidae - Chough and Apostlebird					
<i>Corcorax melanorhamphos</i>	White-winged Chough				OW ^{2024, 2021, 2016}
Family Estrildidae - Grassfinches					
<i>Neochima temporalis</i>	Red-browed Finch				W ²⁰²¹
Family Sturnidae - Starlings and Mynas					
* <i>Sturnus tristis</i> syn <i>Acridotheres tristis</i>	Indian Myna				OW ^{2024, 2021, 2016, 2009}
* <i>Sturnus vulgaris</i>	Common Starling				OW ^{2024, 2021, 2016, 2009}
Class Mammalia - Mammals					
Subclass Marsupialia - Marsupials					
Order Diprotodontia					
Superfamily - Petauroidea					
Family Petauridae					
<i>Petaurus breviceps</i>	Sugar Glider			+	T ²⁰¹⁶ , Q ²⁰²²
<i>Petaurus norfolcensis</i>	Squirrel Glider	V			Q ²⁰²²
Superfamily - Phalangeroidea					
Family Phalangeridae - Brushtail Possums					
<i>Trichosurus vulpecula</i>	Common Brushtail Possum				T ²⁰¹⁶ , Q ^{2024, 2022} O ^{2024, 2021, 2016, 2009}
Superfamily - Macropodoidea					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Family Macropodidae - Kangaroos, Wallabies					
<i>Macropus giganteus</i>	Eastern Grey Kangaroo			+	Q ²⁰²¹ O ^{2024, 2021, 2016, 2009}
<i>Notamacropus rufogriseus</i>	Red-necked Wallaby				Q ²⁰²¹
Subclass Eutheria - Eutherian Mammals					
Order Chiroptera					
Family Molossidae - Freetail-bats					
<i>Austronomus australis</i> syn <i>Nyctinomus australis</i> , <i>Tadarida australis</i>	White-striped Freetail Bat				U ²⁰¹⁶
<i>Micronomus norfolkensis</i>	Eastern Freetail-bat	V			U ²⁰¹⁶
<i>Ozimops ridei</i> syn. <i>Mormopterus</i> sp. 2					U ²⁰¹⁶
Family Vespertilionidae - Plain-nosed Bats					
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat				U ^{2016, 2009}
<i>Chalinolobus morio</i>	Chocolate Wattled Bat				U ²⁰⁰⁹
<i>Falsistrellus tasmaniensis</i>	Eastern Falsistrelle	V			U ²⁰⁰⁹
<i>Miniopterus australis</i>	Little Bentwing-bat	V			U ²⁰¹⁶
<i>Miniopterus schreibersii oceanensis</i>	Large Bentwing-bat	V			U ²⁰⁰⁹
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat				U ²⁰⁰⁹
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat				U ²⁰⁰⁹
<i>Myotis macropus</i>	Large-footed Myotis	V			U ²⁰²¹
<i>Vespadelus vulturnus</i>	Little Forest Bat				T ²⁰²¹ , U ²⁰⁰⁹
Order Rodentia					
Family Muridae - Rodents					
* <i>Mus musculus</i>	House Mouse				H ²⁰¹⁶
* <i>Rattus rattus</i>	Black Rat				T ²⁰¹⁶

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	REGIONALLY SIGNIFICANT	OBSERVATION TYPE
Order Lagomorpha					
Family Leporidae					
* <i>Lepus europaeus</i>	European Hare				Q ²⁰²²
* <i>Oryctolagus cuniculus</i>	European Rabbit				O ²⁰²¹
Order Carnivora					
Family Canidae					
* <i>Vulpes vulpes</i>	Red Fox				O ^{2021, 2016, 2009}
Family Felidae					
* <i>Felis catus</i>	Cat				O ²⁰²¹
Order Artiodactyla					
Family Bovidae					
* <i>Bos taurus</i>	Cattle				O ^{2024, 2021, 2016, 2009}

Appendix I Tree Survey Results

Tree Data Key for Table I1.

- **DBH** – Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level). Fabric diameter tape used which assumes a circular cross section.
 - **Tree Height** – Estimated with the use of an inclinometer and rangefinder (metres).
 - **Coordinates - GDA - 1994**
 - **Habitat/Hollows** –
 - Class 1** –very large sized hollow openings (i.e. >20cm) suitable for species such as Owls
 - Class 2** – large sized hollow openings (i.e. 15-20cm) suitable for species such as Possums
 - Class 3** –medium sized hollow-openings (i.e. 5-15cm) suitable for species such as Gliders and Possums
 - Class 4** – small sized hollow openings (i.e. <5cm) suitable for species such as microchiropteran bats
- Spout:** Hollow opening towards sky offering little protection from the weather.

Table I1: Details of trees within the subject land and within close proximity.

Tree No.	Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
1	<i>Eucalyptus moluccana</i> Grey Box	365942	6373429	0.89	20	1				Opening at base.	Yes
2	<i>Corymbia maculata</i> Spotted gum	365926	6373423	0.93	20	2	1	3	1	Barn Owls (<i>Tyto alba</i>) have been observed in tree during spotlighting and previous surveys (Peak Land Management 2019)	Yes
3	<i>C. maculata</i>	365991	6373458	1.23	25	2	3	6	3	Lorikeets in hollows. Barn Owls (<i>Tyto alba</i>) have been observed in tree during spotlighting and previous surveys (Peak Land Management 2019)	Yes
4	<i>C. maculata</i>	365982	6373476	0.86	25	6	1	4		Rosellas in hollows. Barn Owls (<i>Tyto alba</i>) have been observed in tree during spotlighting and previous surveys (Peak Land Management 2019)	Yes
5	<i>Eucalyptus tereticornis</i> Forest Red gum	366076	6373336	0.89	20			2			Yes
6	<i>E. tereticornis</i>	366084	6373335	0.27	15						Yes
7	<i>E. tereticornis</i>	366092	6373338	0.42	17						Yes
8	<i>E. tereticornis</i>	366097	6373335	0.64	20						Yes
9	<i>E. tereticornis</i>	366097	6373323	0.38, 0.25	17						Yes
10	<i>E. tereticornis</i>	366101	6373320	0.45, 0.43	20						Yes
11	<i>E. tereticornis</i>	366099	6373315	0.49	18						Yes
12	<i>E. tereticornis</i>	366089	6373314	0.52	18						Yes
13	<i>E. tereticornis</i>	366088	6373319	0.49	19						Yes
14	<i>E. tereticornis</i>	366082	6373319	0.28	16						Yes
15	<i>E. tereticornis</i>	366086	6373329	0.55	18						Yes
16	<i>E. tereticornis</i>	366080	6373324	0.32, 0.31, 0.21	17						Yes
17	<i>E. tereticornis</i>	366078	6373314	0.28,	17						Yes

Tree No.	Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
				0.31							
18	<i>E. tereticornis</i>	366078	6373318	0.57	18						Yes
19	<i>E. tereticornis</i>	366071	6377319	0.30	12				1	One stem is dead	Yes
20	<i>E. tereticornis</i>	366070	6373307	0.19, 0.44	17						Yes
21	<i>E. tereticornis</i>	366076	6373305	0.32, 0.39	18						Yes
22	<i>E. tereticornis</i>	366081	6373307	0.30, 0.49	18						Yes
23	<i>E. tereticornis</i>	366076	6373309	0.21	13						Yes
24	<i>E. tereticornis</i>	366076	6373314	0.36, 0.41, 0.48	19						Yes
25	<i>E. tereticornis</i>	366054	6373299	0.84	20						Yes
26	<i>E. tereticornis</i>	366060	6373286	0.89	20			1	4	Scaly-Breasted Lorikeets coming out of hollow	Yes
27	<i>E. tereticornis</i>	366062	6373277	0.61	20				1	Cracks in dead branches	Yes
28	<i>E. tereticornis</i>	366067	6373286	0.34	17						Yes
29	<i>E. tereticornis</i>	366071	6373283	0.69	20						Yes
30	<i>E. tereticornis</i>	366074	6373290	0.51, 0.54	20						Yes
31	<i>C. maculata</i>	366336	6373427	0.29	15					Scratches on trunk	Yes
32	<i>Eucalyptus punctata</i> Grey Gum	366332	6373426	0.19	10					Scratches on trunk	Yes
33	<i>C. maculata</i>	366332	6373429	0.38	17						Yes
34	<i>E. punctata</i>	366330	6373430	1.01	5					Large spout doing down through middle. Top half of tree is lying next to tree as ground habitat. Big scratches	Yes
35	<i>C. maculata</i>	366325	6373431	0.25	16					Fine scratches on trunk	Yes
36	<i>C. maculata</i>	366322	6373432	0.21	15						Yes
37	<i>C. maculata</i>	366323	6373431	0.11	7						Yes
38	<i>E. punctata</i>	366321	6373434	0.18	6						Yes

Tree No.	Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
39	<i>C. maculata</i>	366319	6373434	0.21	10						Yes
40	<i>C. maculata</i>	366317	6373434	0.16	9						Yes
41	<i>C. maculata</i>	366321	6373434	0.42	18					Long, fine scratches on trunk	Yes
42	<i>Eucalyptus siderophloia</i> Grey Ironbark	366312	6373434	0.22	10						Yes
43	<i>C. maculata</i>	366303	6373436	0.24	12						Yes
44	<i>C. maculata</i>	366286	6373439	0.62	25						Yes
45	<i>C. maculata</i>	366281	6373439	0.25	18						Yes
46	<i>Eucalyptus fibrosa</i> Red Ironbark	366278	6373437	0.32, 0.39	22					2 stems	Yes
47	<i>C. maculata</i>	366263	6373436	0.82	20					Fine scratches on trunk	Yes
48	<i>C. maculata</i>	366262	6373440	0.69	21					Deep scratches consistent with mammals on trunk	Yes
49	<i>C. maculata</i>	366254	6373444	0.47	21					Scratches on trunk	Yes
50	<i>C. maculata</i>	366240	6373446	0.35	12					Lots of scratches on trunk	Yes
51	<i>C. maculata</i>	366237	6373446	0.27	11					Scratches on trunk	Yes
52	<i>C. maculata</i>	366175	6373440	1.22	15	2	1	2	1		Yes
53	<i>C. maculata</i>	366184	6373434	0.44	12					Scratches on trunk	Yes
54	<i>C. maculata</i>	366186	6373427	0.48	11					Scratches on trunk	Yes
55	<i>C. maculata</i>	366192	6373424	0.46	12					Scratches on trunk	Yes
56	<i>C. maculata</i>	366192	6373426	0.39	10					Scratches on trunk	Yes
57	<i>C. maculata</i>	366194	6373420	0.53	11					Scratches on trunk	Yes
58	<i>C. maculata</i>	366204	6373415	0.55	13					Scratches on trunk	Yes
59	<i>C. maculata</i>	366207	6373420	0.65	12					Lots of scratches on trunk	Yes
60	<i>C. maculata</i>	366207	6373423	0.49	15					Scratches on trunk	Yes
61	<i>C. maculata</i>	366207	6373426	0.57	17					Lots of fine scratches on trunk	Yes
62	<i>C. maculata</i>	366208	6373427	0.49	16					Scratches on trunk	Yes
63	<i>C. maculata</i>	366209	6373430	0.44	18					Lots of fine scratches on trunk	Yes
64	<i>C. maculata</i>	366203	6373428	0.29	10						Yes
65	<i>E. siderophloia</i>	366203	6373433	0.89	18						Yes

Tree No.	Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
66	<i>Angophora floribunda</i> Rough-barked Apple	366206	6373365	0.37	15						Yes
67	<i>A. floribunda</i>	366209	6373370	0.37	15						Yes
68	<i>A. floribunda</i>	366209	6373371	0.19	12						Yes
69	<i>A. floribunda</i>	366209	6373369	0.31, 0.15	15						Yes
70	<i>A. floribunda</i>	366210	6373369	0.36	15						Yes
71	<i>A. floribunda</i>	366213	6373370	0.34	15						Yes
72	<i>A. floribunda</i>	366215	6373367	0.40	13					Termites	Yes
73	<i>A. floribunda</i>	366217	6373362	0.34	15						Yes
74	<i>A. floribunda</i>	366215	6373362	0.41	16						Yes
75	<i>E. siderophloia</i>	366222	6373363	0.72	18						Yes
76	<i>A. floribunda</i>	366238	6373385	0.59	17						Yes
77	Dead Tree	366248	6373378	0.22	16						Yes
78	<i>C. maculata</i>	366372	6373416	0.28	18					Scratches on trunk	Unlikely
79	<i>E. tereticornis</i>	366384	6373421	0.66	20						Unlikely
80	<i>E. punctata</i>	366384	6373420	0.46	19						Unlikely
81	<i>E. fibrosa</i>	366390	6373422	0.24	17						Unlikely
82	<i>C. maculata</i>	366389	6373422	0.42	19					Scratches on trunk	Unlikely
83	<i>C. maculata</i>	366394	6373423	0.32	19						Unlikely
84	<i>E. siderophloia</i>	366394	6373423	0.16	16						Unlikely
85	<i>E. tereticornis</i>	366395	6373422	0.59	20						Unlikely
86	<i>C. maculata</i>	366395	6373422	0.47	20					Scratches on trunk	Unlikely
87	<i>C. maculata</i>	366393	6373421	0.57	20					Scratches on trunk	Unlikely
88	<i>E. siderophloia</i>	366402	6373417	0.39	18						Unlikely
89	<i>C. maculata</i>	366404	6373417	0.62	20					Scratches on trunk	Unlikely
90	<i>E. siderophloia</i>	366405	6373416	0.51	20						Unlikely
91	<i>E. tereticornis</i>	366411	6373414	0.28	16						Unlikely
92	<i>E. tereticornis</i>	366416	6373410	0.55	20						Unlikely
93	<i>E. siderophloia</i>	366423	6373406	0.36	19						Unlikely

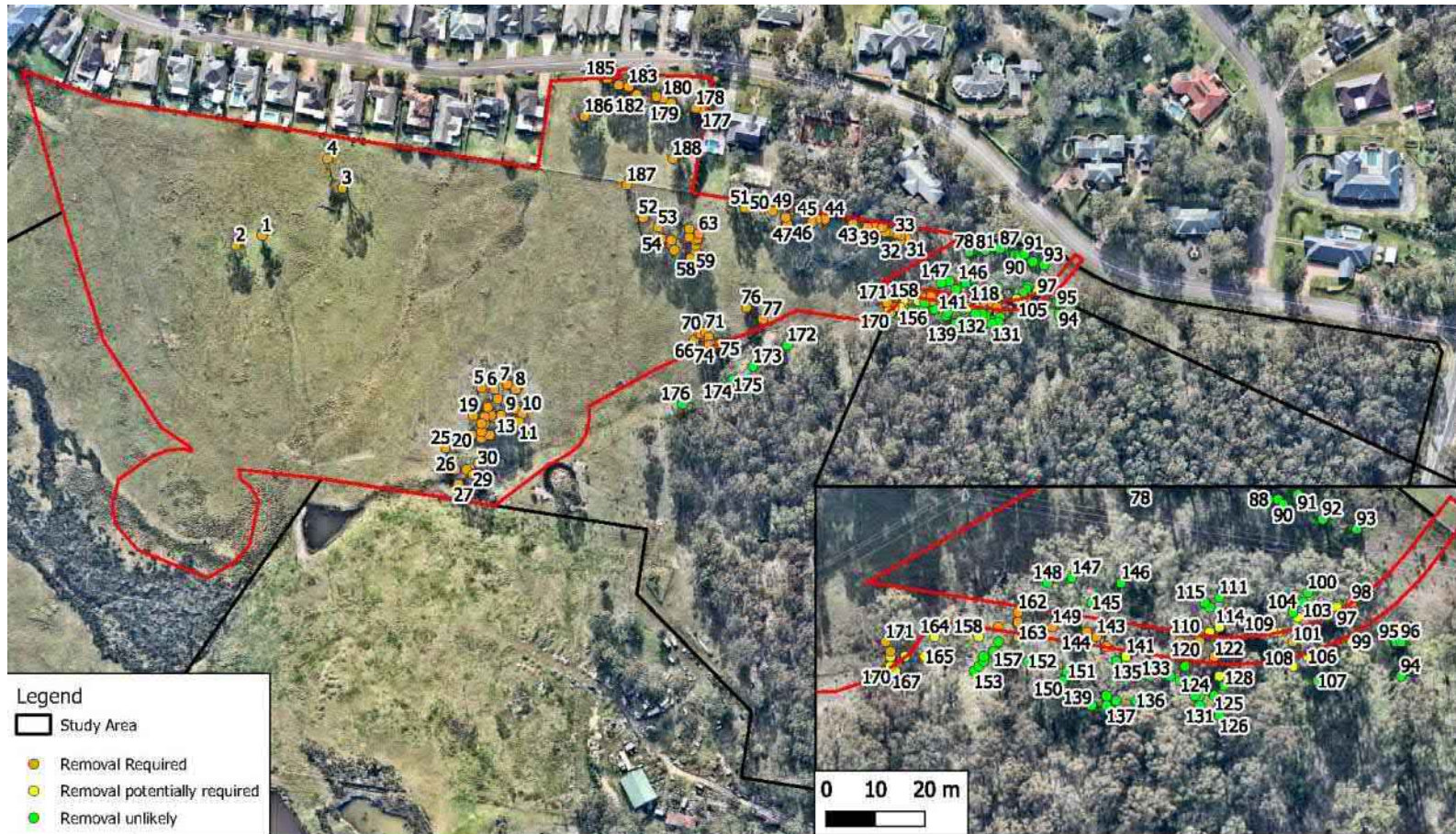
Tree No.	Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
94	<i>E. tereticornis</i>	366429	6373381	0.44	16					Scratches on trunk	Unlikely
95	<i>E. siderophloia</i>	366428	6373388	0.21	13						Unlikely
96	<i>E. tereticornis</i>	366429	6373388	0.34	10						Unlikely
97	<i>E. siderophloia</i>	366416	6373395	0.43	17						Potentially
98	<i>E. siderophloia</i>	366415	6373390	0.21	10						Yes
99	<i>Eucalyptus crebra</i> Narrow-leaved Ironbark	366419	6373388	0.35	17						Potentially
100	<i>Eucalyptus umbra</i> Broad-leaved White Mahogany	366413	6373394	0.28	11						Unlikely
101	<i>C. maculata</i>	366407	6373388	0.29	17					Fine scratches on trunk	Yes
102	<i>C. maculata</i>	366408	6373393	0.45	17					Fine scratches on trunk	Potentially
103	<i>C. maculata</i>	366409	6373396	0.11	6						Unlikely
104	<i>C. maculata</i>	366407	6373394	0.44	19						Unlikely
105	<i>C. maculata</i>	366404	6373390	0.54	19					Scratches on trunk, likely Brushtail possum. White wash	Potentially
106	<i>E. umbra</i>	366410	6373385	0.36	16						Potentially
107	<i>E. siderophloia</i>	366412	6373380	0.22	15						Unlikely
108	<i>C. maculata</i>	366407	6373383	0.6	21						Potentially
109	Dead Tree	366403	6373390	0.57	6					White wash. Lots of scratches on trunk	Potentially
110	<i>Cupaniopsis anacardioides</i> Tuckeroo	366388	6373389	0.22	5	1- spout				Lost/dropped all limbs. Spout opening opens into crack in trunk	Yes
111	<i>C. maculata</i>	366391	6373391	0.42	18						Unlikely
112	<i>C. anacardioides</i>	366390	6373390	0.16	4						Potentially
113	<i>E. umbra</i>	366390	6373395	0.6	18						Unlikely
114	<i>E. tereticornis</i>	366392	6373391	0.12, 0.25	12						Potentially
115	<i>C. maculata</i>	366389	6373396	0.43	19					Scratches on trunk	Unlikely
116	<i>C. maculata</i>	366393	6373381	0.44	19					Scratches on trunk	Potentially
117	<i>E. tereticornis</i>	366384	6373388	0.58	17						Yes
118	<i>E. umbra</i>	366388	6373387	0.22	7						Yes

Tree No.	Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
119	<i>C. maculata</i>	366385	6373383	0.13	5						Unlikely
120	<i>C. maculata</i>	366388	6373388	0.28	12						Yes
121	<i>E. umbra</i>	366392	6373381	0.13	5						Potentially
122	<i>C. maculata</i>	366391	6373385	0.19, 0.49	19		1-spout			Dead stem with spout. Scar in main stem with flaking wood	Yes
123	<i>E. siderophloia</i>	366388	6373377	0.21	14						Unlikely
124	<i>E. siderophloia</i>	366387	6373377	0.12	8						Unlikely
125	<i>C. maculata</i>	366391	6373377	0.33	18					Scratches on trunk	Unlikely
126	<i>C. maculata</i>	366392	6373373	0.43	18						Unlikely
127	<i>C. maculata</i>	366393	6373376	0.11	7						Unlikely
128	<i>C. maculata</i>	366393	6373379	0.29	18						Unlikely
129	<i>C. maculata</i>	366393	6373375	0.27	17						Unlikely
130	<i>E. umbra</i>	366392	6373376	0.13	8						Unlikely
131	<i>E. siderophloia</i>	366388	6373375	0.14	9						Unlikely
132	<i>C. maculata</i>	366384	6373380	0.33	18						Unlikely
133	<i>C. maculata</i>	366382	6373381	0.26	18						Unlikely
134	<i>E. siderophloia</i>	366378	6373381	0.22	12						Unlikely
135	<i>E. siderophloia</i>	366371	6373384	0.23	15						Unlikely
136	<i>C. maculata</i>	366375	6373376	0.19	13					Nobbly growth on trunk	Unlikely
137	<i>E. siderophloia</i>	366369	6373375	0.17	12						Unlikely
138	<i>C. maculata</i>	366371	6373376	0.62	19						Unlikely
139	<i>C. maculata</i>	366366	6373375	0.22	11						Unlikely
140	<i>E. siderophloia</i>	366369	6373377	0.19, 0.34	12						Unlikely
141	<i>E. crebra</i>	366373	6373385	0.39	17						Potentially
142	<i>E. umbra</i>	366369	6373387	0.21	14						Yes
143	<i>E. tereticornis</i>	366367	6373389	0.26	15						Yes
144	<i>C. maculata</i>	366365	6373390	0.16	11						Yes
145	<i>E. umbra</i>	366366	6373396	0.51	16						Unlikely
146	<i>E. tereticornis</i>	366366	6373395	0.18,	20					Scratches on trunk	Unlikely

Tree No.	Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
				0.62							
147	<i>E. tereticornis</i>	366361	6373397	0.81	20						Unlikely
148	<i>E. siderophloia</i>	366357	6373389	0.14	6						Unlikely
149	<i>E. umbra</i>	366358	6373391	0.34, 0.43	15						Yes
150	<i>C. maculata</i>	366360	6373380	0.38	18					Some scratches on trunk	Unlikely
151	<i>C. maculata</i>	366361	6373382	0.31	18					Scratches on trunk	Unlikely
152	<i>E. tereticornis</i>	366353	6373384	0.39	18					Lots of scratches on trunk. Fresh Brushtail possum scat at base	Unlikely
153	<i>E. siderophloia</i>	366342	6373382	0.39	17						Unlikely
154	<i>C. maculata</i>	366343	6373383	0.32	18					Scratches on trunk	Unlikely
155	<i>C. maculata</i>	366344	6373384	0.11	5						Unlikely
156	<i>E. siderophloia</i>	366344	6373385	0.31	16						Unlikely
157	<i>C. maculata</i>	366346	6373386	0.22	14						Unlikely
158	<i>E. tereticornis</i>	366343	6373389	0.32	14						Potentially
159	<i>E. siderophloia</i>	366347	6373391	0.2	9						Yes
160	<i>E. tereticornis</i>	366351	6373389	0.18	11					Fine scratches on trunk	Yes
161	<i>E. tereticornis</i>	366347	6373388	0.16	9					Fine scratches on trunk	Unlikely
162	<i>E. tereticornis</i>	366351	6373394	0.34	15						Yes
163	<i>E. tereticornis</i>	366351	6373392	0.25	14					Fine scratches on trunk	Yes
164	<i>E. tereticornis</i>	366334	6373389	0.2	14						Potentially
165	<i>E. crebra</i>	366332	6373385	0.51	19						Potentially
166	<i>E. tereticornis</i>	366328	6373385	0.18	12						Potentially
167	<i>C. maculata</i>	366326	6373382	0.26	11					Scratches on trunk	Potentially
168	<i>C. maculata</i>	366325	6373385	0.39	18					Some scratches on trunk	Potentially
169	<i>E. tereticornis</i>	366325	6373386	0.25	13					Lots of scratches on trunk	Yes
170	<i>E. siderophloia</i>	366325	6373383	0.62	16						Potentially
171	<i>E. fibrosa</i>	366324	6373388	0.35	11						Yes
172	<i>C. maculata</i>	366263	6373362	0.45	14					Scratches on trunk	Unlikely
173	<i>C. maculata</i>	366242	6373349	0.28	10						Unlikely

Tree No.	Species	Easting GDA94	Northing GDA94	DBH (m)	Height (m)	Habitat				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
174	<i>A. floribunda</i>	366229	6373340	0.22	11						Unlikely
175	<i>A. floribunda</i>	366230	6373341	0.25	11						Unlikely
176	<i>E. umbra</i>	366199	6373326	0.26, 0.30	10						Unlikely
177	<i>C. maculata</i>	366211	6373506	0.73	11					Scratches on trunk	Yes
178	<i>C. maculata</i>	366207	6373507	0.23	18					Scratches on trunk	Yes
179	<i>C. maculata</i>	366192	6373510	0.51	16					Scratches on trunk	Yes
180	<i>C. maculata</i>	366187	6373513	0.57	15					Scratches on trunk	Yes
181	<i>C. maculata</i>	366183	6373514	0.57	16					Scratches on trunk. Scar in trunk	Yes
182	<i>C. maculata</i>	366171	6373515	0.59	16						Yes
183	<i>C. maculata</i>	366166	6373520	0.82	16				1	Scratches on trunk. Scar with opening/hollow 1m up trunk	Yes
184	<i>C. maculata</i>	366160	6373521	0.44	16					Scratches on trunk	Yes
185	<i>C. maculata</i>	366153	6373525	0.81, 0.47	17					Scratches on trunk	Yes
186	<i>C. maculata</i>	366139	6373502	1.44	16				2	Large scratches on trunk	Yes

Figure I1 Location of surveyed trees



Legend

- Study Area
- Removal Required
- Removal potentially required
- Removal unlikely

Job Ref	12503
A4 Scale	1:3,000

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 portrayed is free from error or omission. In addition the spatial accuracy of the map is wholly dependent on source data. Please verify the accuracy of all information prior to use. Development footprint areas should be used for indicative areas only.

0 50 100 150 m
Map Projection GDA2020 MGA Zone 56
Data Sources: LPI (2024), Reamap (11/06/2024)

Figure I1
Surveyed Trees
 Lot 141 DP 1225076, Lot 142 DP1225076
 and Lot 8 DP 855275
 East Maitland, NSW
24 July 2024

(a Division of Tattersall Lander Pty Ltd)
 ABN 41 003 509 215