

# Updated Biodiversity Development Assessment Report

for a proposed Caravan Park at

Lot 105 DP 260058

247 Mungo Brush Road

**HAWKS NEST NSW**



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For: **Hawks Nest Village Pty Ltd**

Job Number 12399

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## Document control

Version	Date	Author	Details
1 Draft	02/08/2024	Daryl Harman	Updated Biodiversity Development Assessment Report for a proposed Caravan Park at Lot 105 DP 260058 - 247 Mungo Brush Road, Hawks Nest NSW.
Final	12/08/2024	Daryl Harman	Updated Biodiversity Development Assessment Report for a proposed Caravan Park at Lot 105 DP 260058 - 247 Mungo Brush Road, Hawks Nest NSW.
Updated Final	25/10/2024	Daryl Harman	Updated Biodiversity Development Assessment Report for a proposed Caravan Park at Lot 105 DP 260058 - 247 Mungo Brush Road, Hawks Nest NSW.



## Summary

Wildthing Environmental Consultants were engaged to undertake a Biodiversity Development Assessment Report (BDAR) for the proposed development within Lot 105 DP 260058 (No. 247) Mungo Brush Road, Hawks Nest 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 study area (47.25ha) wholly encompasses Lot 105 DP 260058 (approximately 45ha in size) and is located at 247 Mungo Brush Road, Hawks Nest, NSW within the Mid Coast Council Local Government Area (LGA). The subject land is located on the eastern side of the study area and is defined as the total area of disturbance (area of impact); including both the construction and operational footprints. The subject land covers a total area of 10.30ha and was contained within the area zoned RU2 Rural Landscape.

The proposal is for a caravan park with 148 long term dwelling sites and 27 long term camping sites. The proposal also includes community facilities for use by the occupants of the park, roads, biofiltration raingardens and stormwater infiltration areas. The landscaping plan includes a 50m wide east-west movement corridor for native fauna species, particularly the Koalas to the north of the caravan park. A combination of koala grids, koala friendly and koala excluding fencing has been designed to aid koala movement safely through and around the proposal. The proposal also includes a perimeter road and two entrance ways.

The proposal will be positioned predominantly on an area that is highly disturbed as a result of previous sand mining. The entire subject land contained native vegetation in various conditions. One Plant Community Types (PCT's) were identified within the subject land (Table E1). This PCT was not found to be consistent with any Endangered Ecological Communities.

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

PCT ID	PCT name	TEC	Subject land area (ha)
PCT 3544	Removal of - Coastal Sands Apple-Blackbutt Forest	N/A	10.30
Total area			10.30

### Threatened Species

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

- *Petaurus norfolcensis* (Squirrel Glider) was detected during camera trapping. The Squirrel Glider is a species credit species and was offset with species credits;
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) was detected during the bat call surveys. This species is an ecosystem credit species and was offset under ecosystem credits generated for the clearing of native vegetation;
- *Miniopterus australis* (Little Bent-winged Bat). This species is a dual credit species (species credit and ecosystem credit). The breeding habitat constraints for this species (caves, tunnels, mines, culvert and other structures) were not present within the subject land, therefore species credits were not generated;
- *Phascolarctos cinereus* (Koala) has previously been recorded within the study area during acoustic songmeter surveys conducted by Eco Logical Australia in 2022 (Eco Logical Australia, 2023). The Koala is a species credit species and was offset with species credits;

- *Ninox strenua* (Powerful Owl) was heard calling well north of the subject land during a targeted threatened owl survey in 2021. Calls from the Powerful Owl were also detected incidentally by Eco Logical Australia (Eco Logical Australia, 2023) during an acoustic assessment within the study area. The Powerful Owl is a species credit species and was offset with species credits;
- *Potorous tridactylus* (Long-nosed Potoroo) was recorded within the study area during camera trapping to the west of the subject land. The Long-nosed Potoroo is a species credit species and was offset with species credits;

#### Serious and irreversible impacts (SAIL)

There were no identified SAIL impacts associated with the proposal.

#### 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. Two nationally threatened ecological communities; Coastal Swamp Sclerophyll Forest of New South Wales and South-East Queensland, and Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland were identified within the western portion of the study area. Neither of these communities were located within the subject land. The subject land was located within proximity to the area of Coastal Swamp Sclerophyll Forest. Three nationally listed species *Pteropus poliocephalus* (Grey-headed Flying Fox), *Phascolarctos cinereus* (Koala) and *Potorous tridactylus* (Long-nosed Potoroo) were recorded within the study area. Taking into consideration the mitigation measures it is unlikely that any of the nationally addressed communities or species will be significantly impacted by the proposal.

#### Koala

The subject land was found to fall under 'Chapter 3 Koala Habitat Protection 2020' of the SEPP (Biodiversity and Conservation) 2021. Habitat on site was considered core koala habitat due to the presence of a number of species of Koala Use Trees and records of koala records within the study area. The proposal will result in the removal of three (3) specimens of *E. robusta* (Koala Feed Trees). Compensatory plantings of *E. robusta* will be utilised within the landscaping plan to create an east-west corridor for Koalas. As Core Koala habitat was considered to be present within the study area and subject land an Individual Koala Plan of Management has been prepared (Wildthing Environmental Consultants, 2024b).

#### 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**

Vegetation zone	PCT name	TEC	Impact area (ha)	Biodiversity risk weighting	Number of ecosystem credits required
PCT 3544_Good	Coastal Sands Apple-Blackbutt Forest	N/A	1.06	1.5	26
PCT 3544_Moderate	Coastal Sands Apple-Blackbutt Forest	N/A	0.54	1.5	9
<b>Total</b>					<b>35</b>



**Table E3      Impacts that require an offset – species credits**

Common name	Scientific name	Loss of habitat (ha) or individuals	Number of species credits required
Long-nosed Potoroo	<i>Potorous tridactylus</i>	1.06	34
Powerful Owl	<i>Ninox strenua</i>	1.06	34
Squirrel Glider	<i>Petaurus norfolcensis</i>	1.60	45
Koala	<i>Phascolarctos cinereus</i>	1.60	45

A number of mitigation measures have been given for the construction and operational phase of the proposal.

Taking into the consideration the recommendation of the legal protection of the habitat within the study area outside the subject land by way of a positive covenant or a Biodiversity Stewardship Agreement, the completion of a Vegetation Management Plan (Wildthing Environmental Consultants, 2024a) and Koala Plan of Management (KPoM) (Wildthing Environmental Consultants, 2024b) for the proposal together with the implementation of a 50m wide habitat corridor in the far north of the subject land the proposal is unlikely to have a significant impact on any threatened community or species.

## Contents

Document control	ii
Summary	iii
Contents	vi
List of Tables	viii
List of Figures	x
List of Plates	xi
Shortened forms	xiii
Declarations	xiv
Stage 1: Biodiversity Assessment	17
1.0 Introduction	17
1.1 Proposed development	17
1.2 Legislative Context	24
1.3 Excluded impacts	30
1.4 Information sources	30
2.0 Methods	32
2.1 Site context methods	32
2.2 Native vegetation, threatened ecological communities and vegetation integrity methods	33
2.3 Threatened flora survey methods	34
2.4 Threatened fauna survey methods	41
2.5 Weather conditions	53
2.6 Limitations	58
2.7 Licences	58
3.0 Site context	59
3.1 Assessment area	59
3.2 Landscape features	59
3.3 Native vegetation cover	65
3.4 Past and current disturbance to native vegetation	65
4.0 Native vegetation, threatened ecological communities and vegetation integrity	67
4.1 Native vegetation extent	67
4.2 Plant Community Types	68
4.3 Threatened ecological communities	81
4.4 Vegetation zones	81
4.5 Patch Size	82
4.6 Vegetation integrity (vegetation condition)	86

4.7	Tree Survey	86
4.8	Movement Corridors	86
5.0	Habitat suitability for threatened species	90
5.1	Identification of threatened species for assessment	90
5.2	Presence of candidate species credit species	106
5.3	Threatened species surveys	109
5.4	Expert reports	130
5.5	Area or count, and location of suitable habitat for a species credit species (a species polygon)	130
6.0	Identifying prescribed impacts	136
Stage 2: Impact assessment (biodiversity values and prescribed impacts)		137
7.0	Avoid and minimise impacts	137
7.1	Avoid and minimise direct and indirect impacts	137
7.2	Avoid and minimise prescribed impacts	142
7.3	Other measures considered	143
7.4	Summary of measures to avoid and minimise impacts	143
8.0	Impact assessment	155
8.1	Direct impacts	155
8.2	Residual Indirect impacts	156
8.3	Prescribed impacts	160
8.4	Mitigating residual impacts – management measures and implementation	164
9.0	Serious and irreversible impacts	167
9.1	Assessment for serious and irreversible impacts on biodiversity values	167
10.0	Impact summary	169
10.1	Determine an offset requirement for impacts	169
11.0	Biodiversity credit report	172
11.1	Ecosystem credits	172
11.2	Species credits	173
12.0	Considerations under State Environmental Planning Policy (Biodiversity and Conservation) 2021	174
12.1	Chapter 3 Koala Habitat Protection 2020	174
12.1	First Consideration – Is the Land ‘Potential Koala Habitat’?	174
12.2	Second Consideration – Is the Land Core Koala Habitat?	174
14.0	NSW Biosecurity Act 2015	181



15.0 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance	182
16.0 Public Inquiry into the Ecological Significance of Land cover by the North Hawks Nest Draft Local Environment Study (2002)	183
17.0 References	184
Appendix A: BDAR requirements compliance	189
Appendix B: Biodiversity Values Map and Threshold tool report	205
Appendix C: Commonwealth Environment Protection and Biodiversity Conservation Act 1999 & Matters of National Environmental Significance	209
Appendix D: Vegetation survey data	274
Appendix E: Credit reports	291
Appendix F: Total Flora List	304
Appendix G: Fauna Survey Results	318
Appendix H: Total Vertebrate Fauna List	338
Appendix I Tree Survey Results	348

## List of Tables

Table E2	Impacts that require an offset – ecosystem credits	iv
Table E3	Impacts that require an offset – species credits	v
Table 1.1:	Criteria for entry into the Biodiversity Offsets Scheme in relation to the proposal.	25
Table 1.2	Desktop Resources	30
Table 2.1	Environmental conditions during threatened species surveys	53
Table 3.1	Native vegetation cover in the assessment area	65
Table 4.1	PCTs identified and extent within the study area	68
Table 4.2	PCT 3544 - Coastal Sands Apple-Blackbutt Forest	68
Table 4.3	PCT 4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest	72
Table 4.4	PCT 4000 - Northern Estuarine Paperbark Sedge Forest	74
Table 4.5	PCT 4026 - Estuarine Sea Rush Swamp Oak Forest	76
Table 4.6	PCT 4091 - Grey Mangrove-River Mangrove Forest	78
Table 4.7	Vegetation zones and patch sizes	85
Table 4.8	Vegetation integrity scores	86
Table 5.1	Predicted ecosystem credit species	90

Table 5.2	Predicted flora species credit species	96
Table 5.3	Predicted fauna species credit species	99
Table 5.4	Determining the presence of candidate flora species credit species on the subject land	106
Table 5.5	Determining the presence of candidate fauna species credit species on the subject land	107
Table 5.6	Threatened species surveys for candidate flora species credit species on the subject land	110
Table 5.7	Threatened species surveys for candidate fauna species credit species on the subject land	113
Table 6.1	Prescribed impacts identified	136
Table 7.1	Avoidance and minimisation measures for direct, indirect and prescribed impacts	144
Table 8.1	Summary of residual direct impacts	155
Table 8.2	Impacts to vegetation integrity	156
Table 8.3	Summary of residual indirect impacts	156
Table 8.4	Groundwater Dependent Ecosystems present in the study area.	161
Table 8.5	Prescribed impacts – vehicle strikes	163
Table 8.6	Summary of proposed mitigation and management measures for residual impacts (direct, indirect and prescribed)	164
Table 9.1	Entities at risk of an SAI	167
Table 10.1	Impacts that require an offset – ecosystem credits	169
Table 10.2	Impacts that require an offset – species credits	170
Table 11.1	Ecosystem credit class and matching credit profile	172
Table 11.2	Species credit class and matching credit profile	173
Table 14.1	Priority Weed species found within the subject land and study area.	181
Table A 1	Assessment of compliance with BDAR minimum information requirements	189
Table D1	Vegetation BAM Plot survey data and locations	274
Table F1	Total Flora List	305
Table G1:	Small Terrestrial Mammal Trapping Results.	320
Table G2:	Medium Terrestrial Mammal Trapping Results.	320
Table G3	Results of the Ground Camera Trapping Surveys	321
Table G4	Results of the Arboreal Camera Trapping Surveys	322
Table G5:	Arboreal Mammal Trapping Results.	324
Table G6:	Categorisation of Koala activity	330
Table G7:	Results of the Spot Assessment Technique (SAT) #1 E-423373, N-6387043	331

Table G8: Results of the Spot Assessment Technique (SAT) #2 survey E-423331, N-6386980	332
Table G9: Results of the Spot Assessment Technique (SAT) #3 survey E-423268, N-6386871	333
Table G10: Results of the Spot Assessment Technique (SAT) #4 survey E- 423094, N-6387157	334
Table G11: Microchiropteran Harp Trapping Results	337
Table H1      Total Vertebrate Fauna List	339

## List of Figures

Figure 1.1	Location Map	19
Figure 1.2	Aerial Image of Study Area	20
Figure 1.3	Design Plans	22
Figure 1.4	Detailed Layout showing 50m wildlife corridor.	23
Figure 1.5	Biodiversity Values	26
Figure 2.1:	Plot Survey Design	34
Figure 2.2	Targeted Flora Survey Tracks (June 2019)	36
Figure 2.3	Targeted Flora Survey Tracks (July 2024)	37
Figure 2.4	Targeted Flora Survey Tracks (August 2019)	38
Figure 2.5	Targeted Flora Survey Tracks (September)	39
Figure 2.6	Targeted Flora Survey Tracks (October 2019)	40
Figure 2.7	Amphibian Survey Tracks	42
Figure 2.8	Spotlighting Survey Tracks	44
Figure 2.9	Stagwatching, Harp Trapping, Stationary Anabat, Call-playback and Camera Trap Locations	45
Figure 2.10	Trapping Locations	48
Figure 3.1	Assessment area showing Prescribed Streams and Water Bodies	60
Figure 3.2	Assessment area showing Fauna Corridors and Key Habitat	62
Figure 3.3	Soil Landscapes within the Study Area	63
Figure 3.4	Important Areas Map – Migratory Seabirds	64
Figure 3.5	Native vegetation mapped within the assessment area	66
Figure 4.1	PCT's within the study area & subject land	80
Figure 4.2	Vegetation Zones within the subject land	83
Figure 4.3	Patch Size determination	84
Figure 4.4	Significant Tree Survey Map	88
Figure 4.5	Existing and future movement corridors	89



Figure 5.1	<i>Petaurus norfolcensis</i> (Squirrel Glider) Species Polygon	132
Figure 5.2	<i>Phascolarctos cinereus</i> (Koala) Species Polygon	133
Figure 5.3	<i>Ninox strenua</i> (Powerful Owl) Species Polygon	134
Figure 5.4	<i>Potorous tridactylus</i> (Long-nosed Potoroo) Species Polygon	135
Figure 7.1	Previous Development Design Plans	139
Figure 7.2	Original Design Plans with revised secondary access	140
Figure 7.3	Areas avoided and Impacted	141
Figure D 1	Location: Vegetation BAM Plot locations.	275
Figure G1	Koala Spot Assessment Technique Locations	336

### List of Plates

Plate 2.7: Cage Trap	50
Plate 2.8: Harp Trap.	51
Plate 4.1: PCT 3544 - Coastal Sands Apple-Blackbutt Forest (Good Condition)	70
Plate 4.3: PCT 3544 - Coastal Sands Apple-Blackbutt Forest (Moderate Condition)	71
Plate 4.4: PCT 3544 - Coastal Sands Apple-Blackbutt Forest (derived)	71
Plate 4.5: PCT 4006 Northern Paperbark-Swamp Mahogany Saw-sedge Forest	73
Plate 4.6: PCT 4006 Northern Paperbark-Swamp Mahogany Saw-sedge Forest	73
Plate 4.7: PCT 4000 - Northern Estuarine Paperbark Sedge Forest	75
Plate 4.8: PCT 4000 - Northern Estuarine Paperbark Sedge Forest	75
Plate 4.9: PCT 4026 Estuarine Sea Rush Swamp Oak Forest	77
Plate 4.10: PCT 4026 Estuarine Sea Rush Swamp Oak Forest	77
Plate D1: Plot 1A-PCT 3544_Good Front Peg.	286
Plate D2: Plot 1A-PCT 3544_Good Back Peg.	286
Plate D3: Plot 2A-PCT 3544_Moderate Front Peg.	287
Plate D4: Plot 2A-PCT 3544_Moderate Back Peg.	287
Plate D5: Plot 3A-PCT 3544_Derived Front Peg.	288
Plate D6: Plot 3A-PCT 3544_Derived Back Peg.	288
Plate D7: Plot 3B-PCT 3544_Derived Front Peg.	289
Plate D8: Plot 3B PCT 3544_Derived Back Peg.	289
Plate D9: Plot 3C PCT 3544_Derived Front Peg.	290
Plate D10: Plot 3C-PCT 3544_Derived Back Peg.	290
Plate G1 <i>Petaurus norfolcensis</i> (Squirrel Glider) observed on Camera No. A5.	324
Plate G2 <i>Petaurus norfolcensis</i> (Squirrel Glider) observed on Camera No. A5.	325
Plate G3 <i>Petaurus norfolcensis</i> (Squirrel Glider) observed on Camera No. A7.	325
Plate G4 <i>Antechinus stuartii</i> (Brown Antechinus) observed on Camera No. A8.	326

Plate G5 <i>Potorous tridactylus</i> (Long-nosed Potoroo) Camera No. G4.	326
Plate G6 <i>Potorous tridactylus</i> (Long-nosed Potoroo) Camera No. G4.	327
Plate G7 <i>Isoodon macrourus</i> (Northern brown Bandicoot) Camera No. G4.	327
Plate G8 <i>Canis familiaris dingo</i> (Dingo) observed on Camera No. G6.	328
Plate G9 <i>Wallabia bicolor</i> (Swamp Wallaby) observed on Camera No. G4.	328
Plate G10 <i>Trichosurus vulpecula</i> (Common Brushtail Possum) observed on Camera No. G6.	329
Plate G11 <i>Canis familiaris dingo</i> (Dingo) observed on Camera No. G1.	329

## 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 (Commonwealth)
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
NSW DCCEEW	NSW Department of Climate Change, Energy the Environment and Water (State)
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: 25/10/2024**

**BAM Assessor Accreditation no: BAAS17074**

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 Targeted threatened flora surveys BAM plot surveys BAM-C data entry and analysis Report preparation	BEnvSc
Dr Kylie Bridges	BAAS20005	Ecologist	Targeted threatened species surveys. Targeted threatened flora surveys Report preparation	BEnvSc Hons PhD
Nicola Mohr	BAAS23007	Ecologist	Targeted threatened species surveys Targeted threatened flora surveys Figure preparation 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: 25/10/2024

BAM Assessor Accreditation no: BAAS17074



## **Stage 1: Biodiversity Assessment**

### **1.0 Introduction**

#### **1.1 Proposed development**

##### **1.1.1 Development overview**

It is proposed that a caravan park with 148 long term dwelling sites and 27 long term camping sites be constructed Lot 105 DP 260058 (No. 247) Mungo Brush Road, Hawks Nest 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 (47.25ha) wholly encompasses Lot 105 DP 260058 (approximately 45ha in size) and is located at 247 Mungo Brush Road, Hawks Nest, NSW within the Mid Coast Council Local Government Area (LGA). The study area was bordered by the Myall River to the west and Mungo Brush Road to the east. The study area also includes the narrow strip of road reserve alongside Mungo Brush Road. Under the Great Lakes Environmental Plan (Great Lakes Council, 2014) the eastern portion of the study area is zoned RU2 Rural Landscape with the majority of the western portion zoned C2 Environmental Conservation.

The subject land was located within the east of the study area and is defined as the total area of disturbance (area of impact); including both the construction and operational footprints. The construction and operation footprints include the proposed caravan park, biofiltration raingarden in the north and stormwater infiltration areas in the north and west. The subject land covers a total area of 10.30ha and was contained within the area zoned RU2 Rural Landscape. In accordance with Section 3.1.1.1 of the BAM assessment of biodiversity values will be confined to impacted areas within the subject land. 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 proposal is for a caravan park with park with 148 long term dwelling sites and 27 long term camping sites. The proposal also includes community facilities for use by the occupants of the park, roads and several drainage areas. During the construction phase of the development, stormwater infiltration areas will be shaped into the ground to the north and west of the caravan park. These areas will be surrounded by berms / bunds (300mm high) to hold the water in this area to infiltrate. These areas are designed to control mounding of excess water from heavy rain events during the

operational phase of the proposal. Overall, there will be 'some' flow entering around twice a year on average, but the 300mm maximum

Figure 1.1 Location Map





Figure 1.2 Aerial Image of Study Area



storage depth will be sufficient to capture and hold water from a 100yr storm. During the construction of the stormwater infiltration areas, topsoil containing the seedbank will be stripped and saved aside while the ground is shaped. Once shaping has been completed the saved topsoil with seedbank will be spread back over the infiltration area and tree species will be planted as outlined in the VMP (Wildthing Environmental Consultants 2024). Biofiltration raingardens will be installed along the western and northern perimeter of the caravan park. These areas will also be planted with native species as outlined in the VMP (Wildthing Environmental Consultants 2024). The landscaping plan includes an east west movement corridor for native fauna species such as Koalas located to the north of the caravan park (overlapping with the northern stormwater infiltration area). Details of the planting and maintenance of this corridor has been outlined in the VMP (Wildthing Environmental Consultants 2024). A combination of koala grids, koala friendly and koala excluding fencing has been designed to aid koala movement safely through and around the proposal. The proposal also includes a perimeter road and two entrance ways. The proposal will be positioned predominantly on a highly modified area which has been subject to previous sand mining.

The proposed development layout is shown in Figures 1.3, 1.4 & 1.5.



Figure 1.3 Design Plans





The detailed layout plan shows a residential development with lots numbered 11 through 127. The plan includes roads 10, 11, and 12, and various landscaping features such as rain gardens, pathways, and a stormwater infiltration area. The plan is titled "DETAILED LAYOUT PLAN 7" and includes a table of contents and a scale bar.

NO.	DESCRIPTION	DATE	BY	CHKD	APPD	DATE
1	Issued for Construction	10/10/2023	AV	AV	AV	10/10/2023
2	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
3	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
4	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
5	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
6	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
7	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
8	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
9	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
10	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
11	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
12	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
13	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
14	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
15	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
16	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
17	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
18	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
19	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
20	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
21	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
22	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
23	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
24	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
25	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
26	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
27	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
28	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
29	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
30	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
31	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
32	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
33	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
34	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
35	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
36	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
37	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
38	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
39	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
40	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
41	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
42	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
43	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
44	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
45	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
46	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
47	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
48	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
49	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023
50	Revised for Construction	10/10/2023	AV	AV	AV	10/10/2023

## 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.

The NSW Biodiversity Values map showed the western portion of the study area as containing Biodiversity Values. The proposed subdivision within the subject land has been positioned outside of the Biodiversity Values mapped areas. The BOS clearing threshold for the subject land was 1.0ha. The area of the construction and operational footprint exceeds this threshold. 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.

**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 1.6	The NSW Biodiversity Values Map Version 16.13 was last consulted on the 29 July 2024. Mapped Biodiversity Values occur in the west of the subject lot. Mapped Biodiversity Values were located outside of the impact area. As the areas mapped on the Biodiversity Values Map are located outside of the impact area, the proposal would not exceed the biodiversity offsets scheme threshold in regard to Section 7.2(b) of the BC Act.
Development activities that involve clearing of native vegetation that exceeds the Biodiversity Offset Scheme thresholds (BOS thresholds) as determined by the NSW BC regulation.		According to the BMAT Report, the clearing threshold for the subject land 1.0ha. Up to 10.30ha 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 would be required.



Figure 1.5 Biodiversity Values





### 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. One candidate SAIL entities *Miniopterus australis* was recorded within the subject land, however no preferred breeding habitat was present. Therefore, the proposal was not found to impact this SAIL entity. 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.

### 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 subject land is located within the Mid Coast Council and is zoned as RU2. Therefore, the subject land falls under 'Chapter 3 Koala habitat protection' 2020 of the SEPP (Biodiversity and Conservation) 2021.

#### 1.2.4.1 Chapter 3 Koala Habitat Protection 2020

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

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

This Chapter applies to land use zones RU1, RU2 and RU3 (or an equivalent land use zone) in LGAs specified in the SEPP (Biodiversity and Conservation) 2021, which includes the Mid Coast Council LGA. This Chapter has been addressed in Section 12.0 of this report.

#### 1.2.5 State Environmental Planning Policy (Resilience and Hazards) 2021

The State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP) consolidates and repeals the provisions of the following 3 SEPPs:

1. SEPP (Coastal Management) 2018 (Coastal Management SEPP)
2. SEPP 33 – Hazardous and Offensive Development (SEPP 33)
3. SEPP 55 – Remediation of Land (SEPP 55)

Each consolidated SEPP now makes up a chapter in the SEPP (Resilience and Hazards) 2021. The following Chapters are relevant to this report:

- Chapter 2 Coastal Management.

#### Chapter 2 Coastal Management

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

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

This Chapter identifies four coastal management areas that comprise the coastal zone. These are:

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

The study area contained areas of Coastal wetlands, Proximity Area for Coastal Wetlands, and Coastal Environment Area Map. Chapter 2 has been addressed further in Section 13.0 of this report.

### **1.2.6 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 14.0 of this report.

### **1.2.7 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. Further information on this matter is provided in Section 15.0 and Appendix C of this report.

### 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 BDAR, 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
<b>Zoning and Regulatory Maps</b>		
Great Lakes Environmental Plan	13 November 2014	Entire study area
<b>Biodiversity Values and Landscape Maps</b>		
NSW Biodiversity Values Map (NSW DCCEEW 2024a)	29 July 2024	Entire study area
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)	Various dates	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	
<b>Threatened Species, Vegetation and Landscape Databases</b>		
BioNet Atlas of NSW Wildlife (BioNet) (NSW DCCEEW 2024b)	July 2024	10x10km radius of subject land
Commonwealth Protected Matters Search Tool (PMST) (DCCEEW 2024a)	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 (NSW DCCEEW 2024e)	July 2024	
BioNet vegetation classification database (NSW DCCEEW 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 (NSW DCCEEW 2024d)	July 2024	
<b>Survey and Reporting Methodology</b>		
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 2022)	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) (DCCEEW 2024f)	July 2024	-
<b>Climactic Data</b>		
061.54 Nelson Bay WWTP (BoM 2019, 2024)	Various dates	-
<b>Previous Ecological Studies</b>		
Key Habitats and Corridors for Forest Fauna A Landscape Framework for Conservation in North-east New South Wales (DCCEEW 2010a AND 2010b)	July 2024	
Biolink (2005). North Hawks Nest Koala Plan of Management. Working Draft No. 1. (February 2005).	July 2024	
'Eco Logical Australia (2023). Koala Plan of Management Review. Prepared for Australia Oracle Developments Pty Ltd.	July 2024	
Great Lakes Council (2002). Public Inquiry into the Ecological Significance of Land Covered by the North Hawks Nest Draft Local Environment Study. Report to Great Lakes Council.	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) and LPI (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*

Native vegetation extent within a 1500m buffer from the edge of the study area was estimated from review of aerial mapping interpretation and spatial data from the forest ecosystem distribution map Mid North Coast Vegetation (EcoLogical Version). VIS\_ID 3886 (EcoLogical 2005). Supplementary iterations and amendments were made to the mapped vegetation extent to conform within the study area scale vegetation extent as mapped by Wildthing (Section 4).

Ten forest ecosystem types were mapped within the 1500 m buffer, including:

- Banksia
- Coastal Sands Blackbutt
- Heath
- Mangrove
- Paperbark
- Saltmarsh
- Smooth-barked Apple
- South Coast Tallowwood-Blue Gum
- Swamp Mahogany
- Swamp Oak

Native vegetation cover within the buffer area (including the survey area) was determined as the sum of all areas of mapped native vegetation that are likely to be derived from the mapped woodland communities.

## **2.2 Native vegetation, threatened ecological communities and vegetation integrity methods**

### **2.2.1 Existing information**

Searches were undertaken of the BioNet VIS Database (NSW DCCEEW 2024c), NSW SEED mapping and previous reports such as the Ecological Assessment North Hawks Nest Local Environment Study (LES) (Eco Logical Australia, 2005).

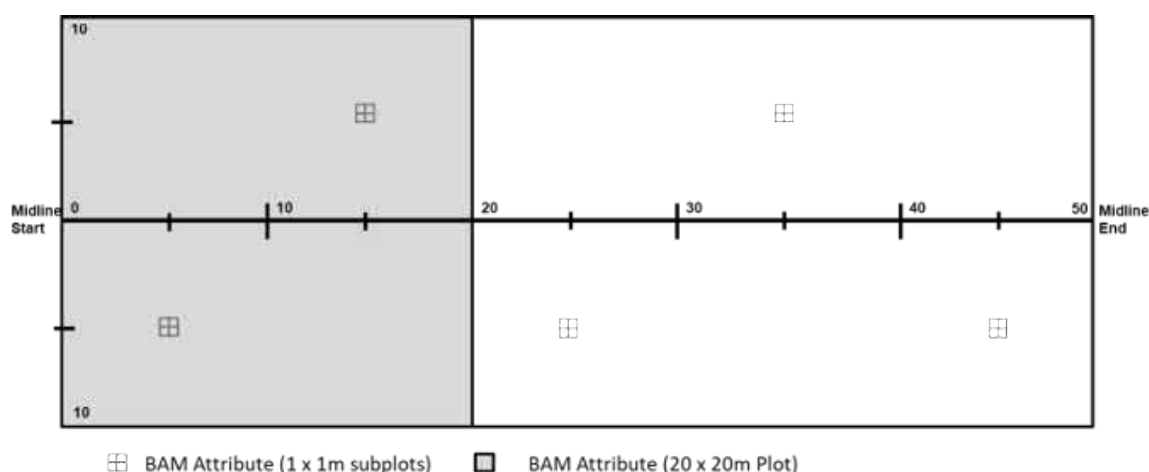
### **2.2.2 Mapping native vegetation extent**

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 August and November 2019. These surveys included the establishment of five 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, 2.3, 2.4, 2.5 and 2.6. It is noted that on some occasions more personnel were present conducting flora surveys than the number of GPS used to record tracks. Additionally, tracks were not successfully recorded during flora surveys on 28 November 2019.

#### *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 (June 2019)

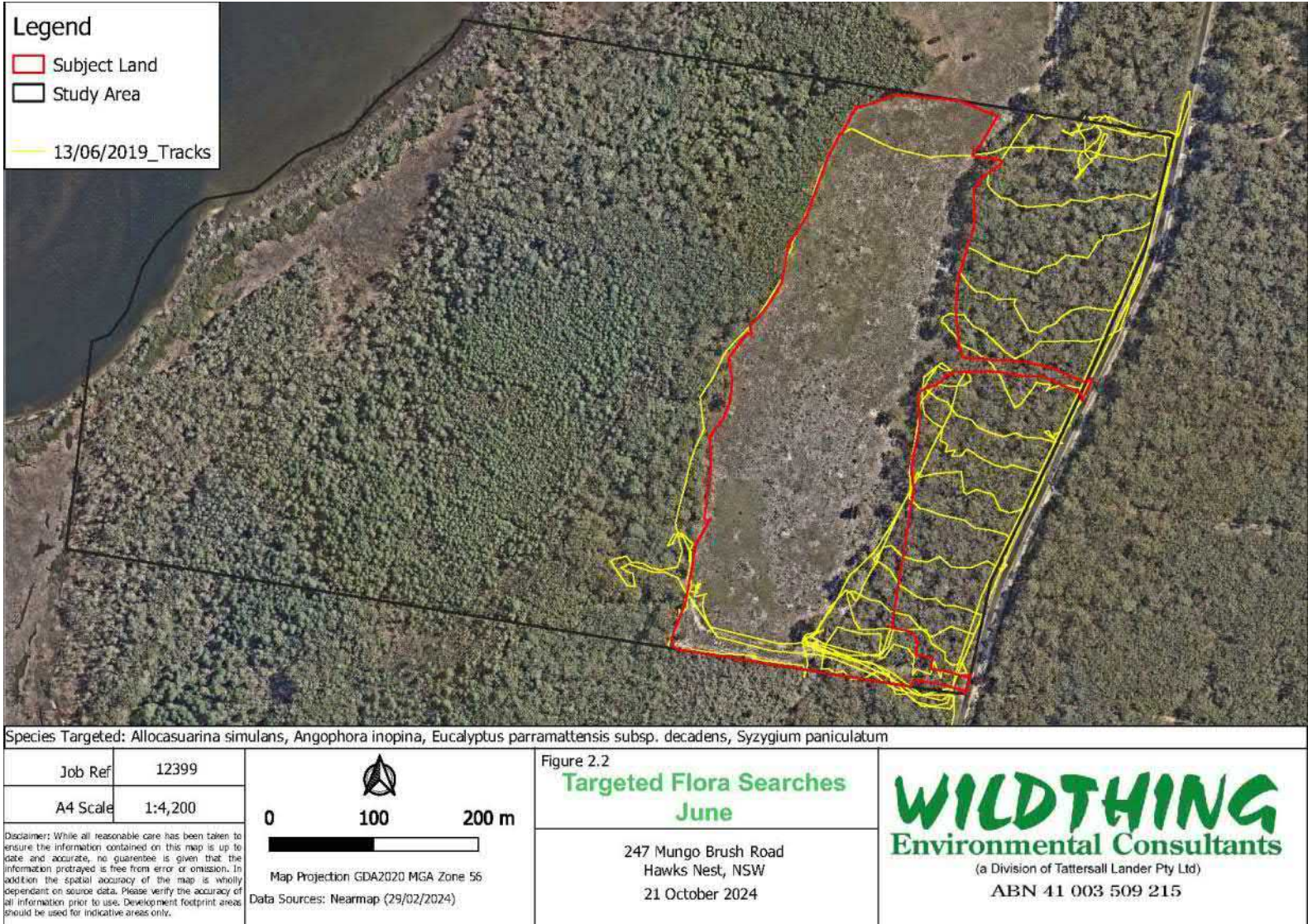




Figure 2.3 Targeted Flora Survey Tracks (July 2024)

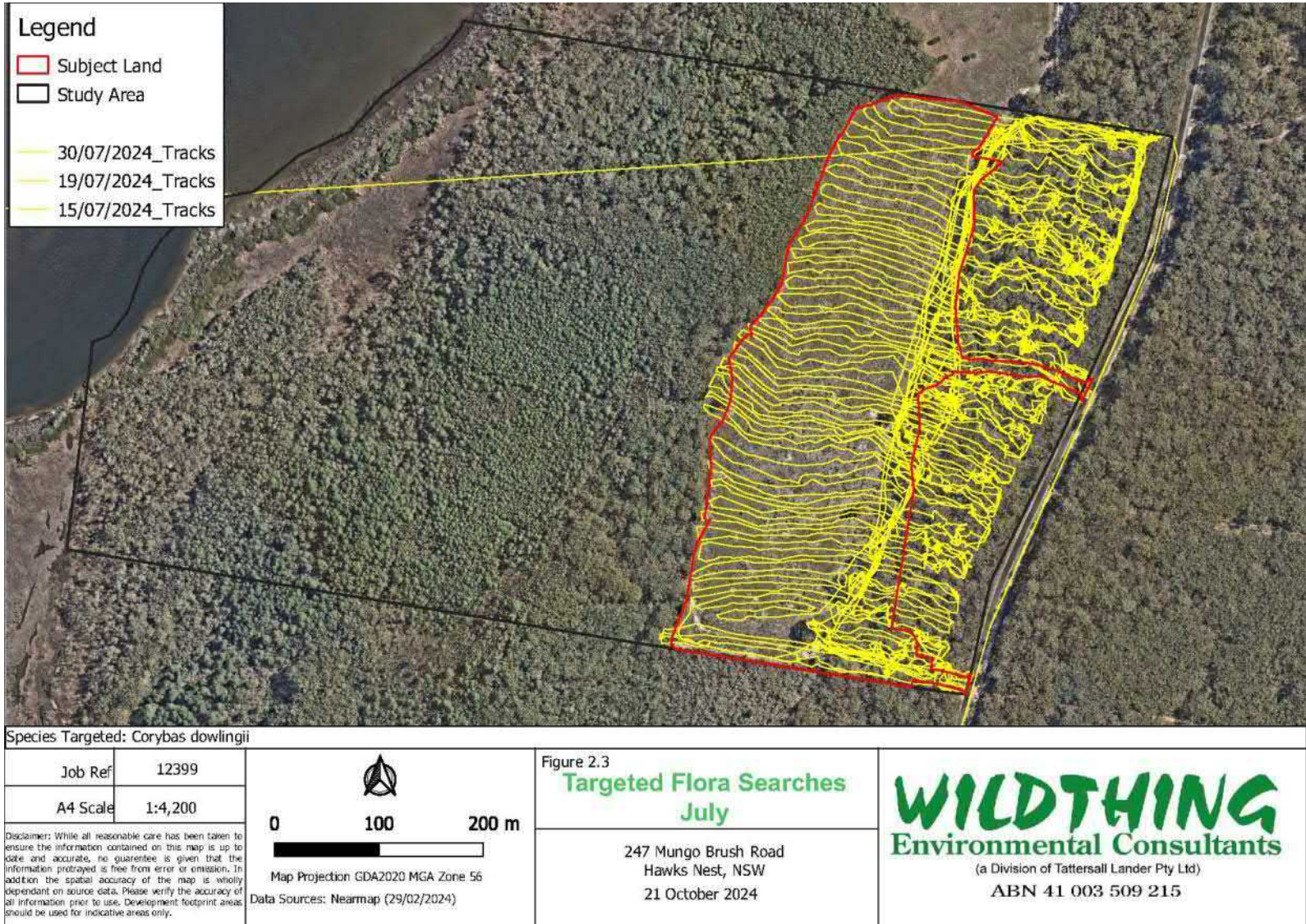




Figure 2.4 Targeted Flora Survey Tracks (August 2019)

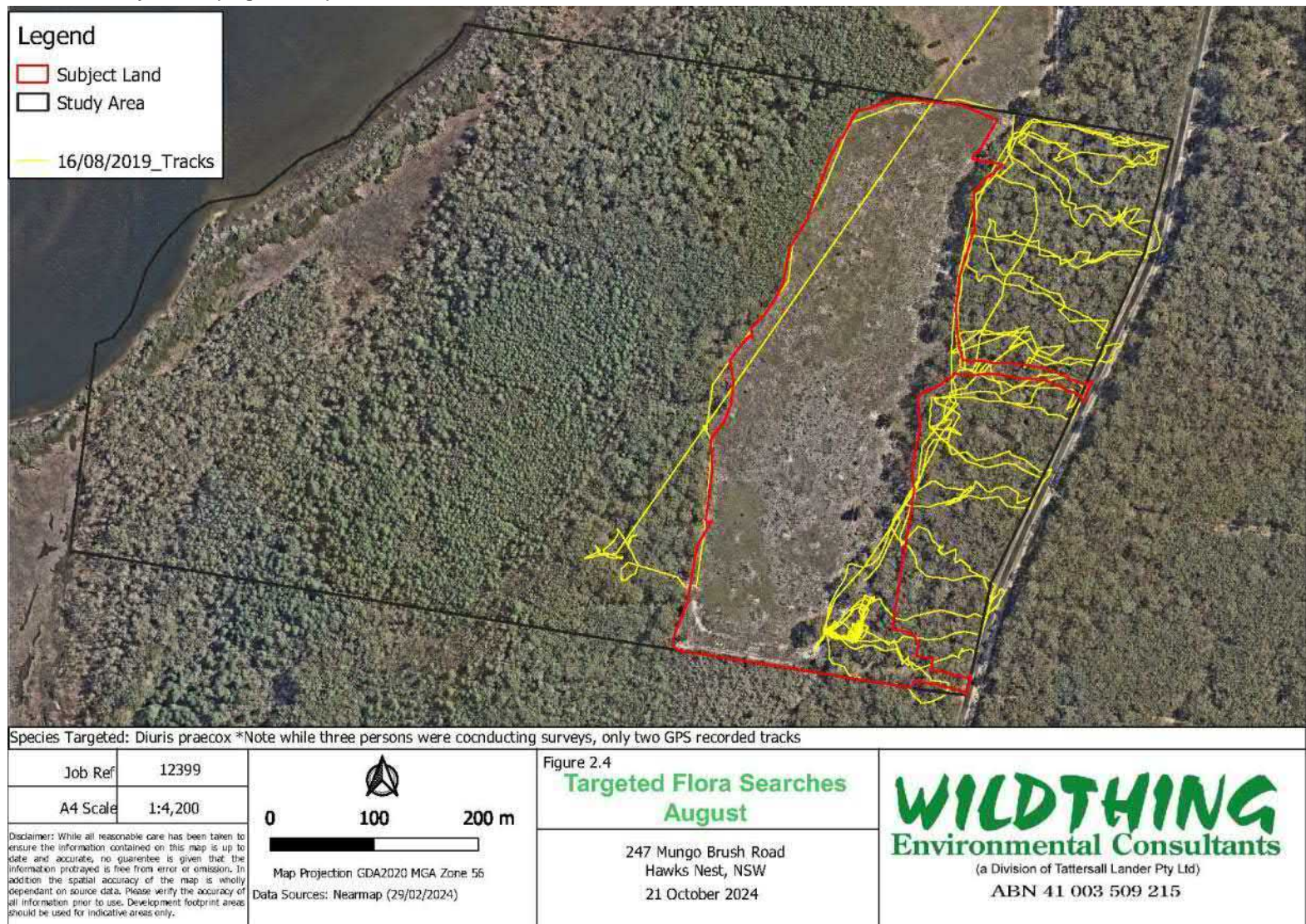




Figure 2.5 Targeted Flora Survey Tracks (September)

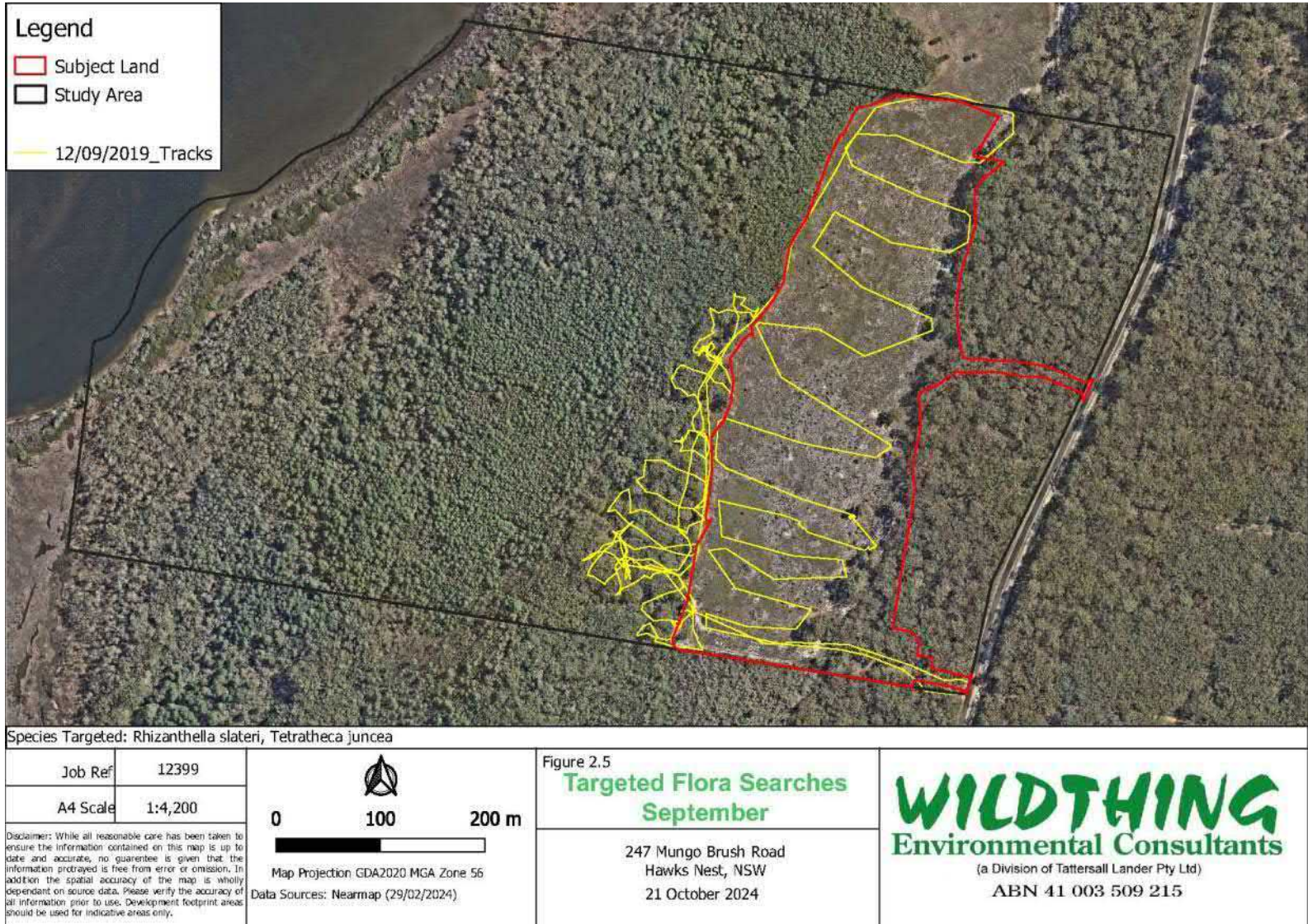




Figure 2.6 Targeted Flora Survey Tracks (October 2019)



## 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.

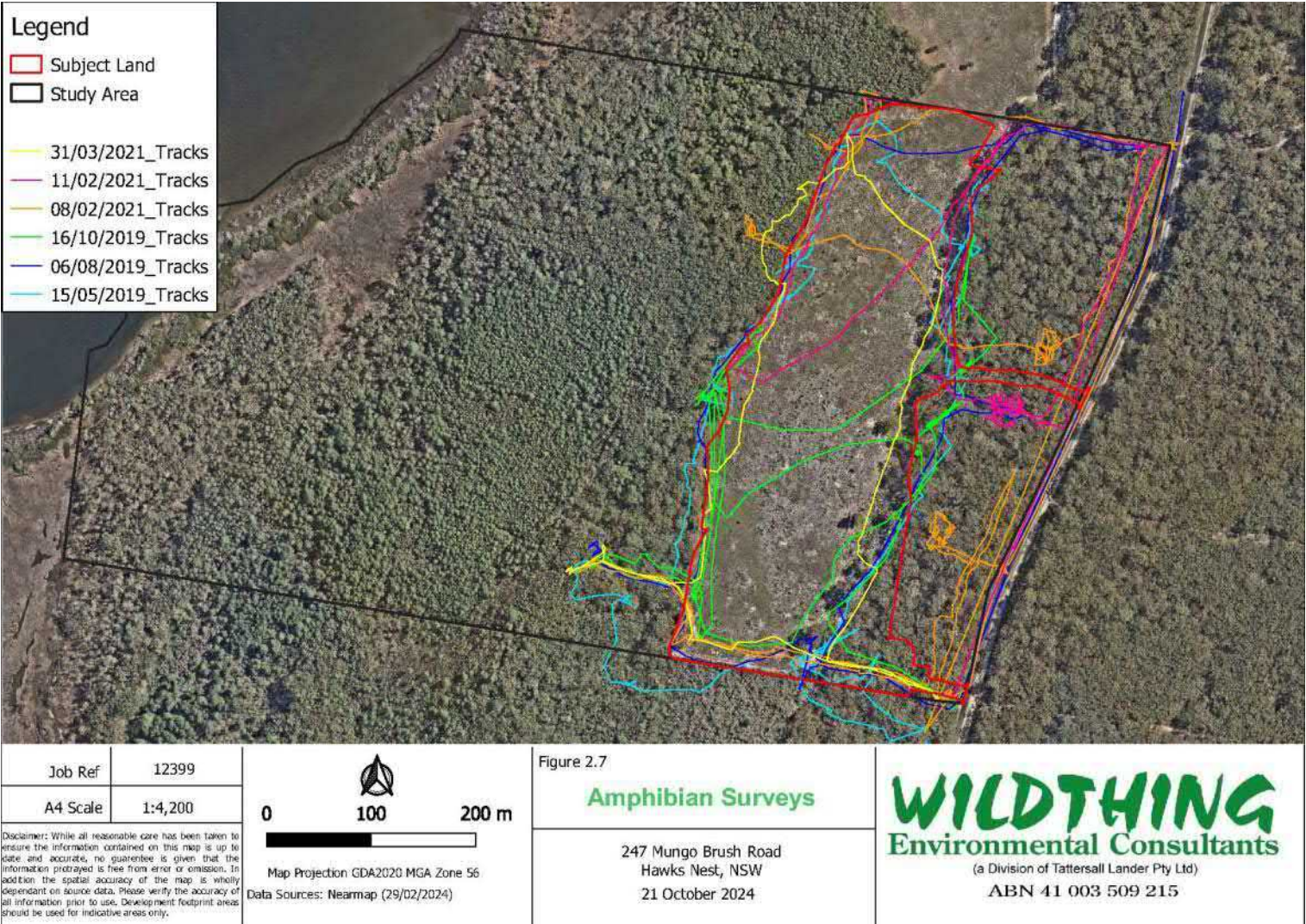
#### 2.4.3.1 Targeted Amphibian Surveys

Amphibian surveys were conducted for the candidate species *Litoria aurea* (Green & Golden Bell Frog), *Uperoleia mahonyi* (Mahony's Toadlet), *Crinia tinnula* (Wallum Froglet) and *Litoria brevipalmata* (Green-thighed Frog). Methods included Nocturnal Aural-visual surveys, which were a combination of listening for the calls of frogs and searching for individuals within suitable habitat. An aural-visual survey commenced with an aural survey where the surveyor/s listened for calls (in silence and darkness). The visual survey detects frogs via 'eyeshine'. Suitable habitat is scanned along the transect, around and between aural survey points, using a headlamp with a minimum of 200 lumens brightness. Walking slowly undertaking the visual search assisted in noticing moving frogs. No surface water or breeding habitat present within the subject land. Aural visual surveys were conducted sometimes in conjunction with spotlighting within the subject land and in proximity. A call-playback component used a loudspeaker to broadcast the advertisement calls of target threatened frogs to elicit either an advertisement or territorial response call.

Amphibian surveys were conducted after periods of high rainfall, a small number of diurnal surveys were also undertaken after rainfall within the subject land to conduct an aural-visual survey during periods of high frog activity. The locations of the Amphibian surveys are shown in Figure 2.4.



Figure 2.7 Amphibian Survey Tracks



#### 2.4.3.2 *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.

#### 2.4.3.3 *Reptile Survey*

Searches for reptiles involved a combination of diurnal, nocturnal searches and pitfall trapping. 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. Spotlighting surveys were conducted using high powered spotlights and head torches to search for nocturnal reptiles. Diurnal searches involved searching in likely habitat (i.e., leaf litter, dead logs and long grass) during the morning and afternoon survey period. The location of Spotlighting surveys is shown in Figure 2.8.

Pitfall trapping consisted of a drift fence with individual pitfall traps (20 litre plastic buckets) dug-in just below ground level spaced along its length. Shelter was placed in the base of each bucket (rock or wood and dirt and leaves) to provide a refuge and shade for trapped animals. A floating shelter (polystyrene platform) was also be placed in the pit in case of rain. A location of the pitfall trap within the subject land is shown in Figure 2.10.

#### 2.4.3.4 *Stagwatching Survey*

The stag watching survey involved watching hollow-bearing trees within the study area, 20 minutes prior to sunset and continuing until 20 minutes after sunset. The person was in a position to allow a good view of the tree to be obtained, preferably with the tree silhouetted against the sky. The required listening period and stag watching were undertaken concurrently. Hollow trees targeted were those suitable for *Petaurus norfolcensis* (Squirrel Glider) and owl species such as *Tyto novaehollandiae* (Masked Owl) and *Ninox strenua* (Powerful Owl). The location of the watched stag trees is shown in Figure 2.9.



Figure 2.8 Spotlighting Survey Tracks

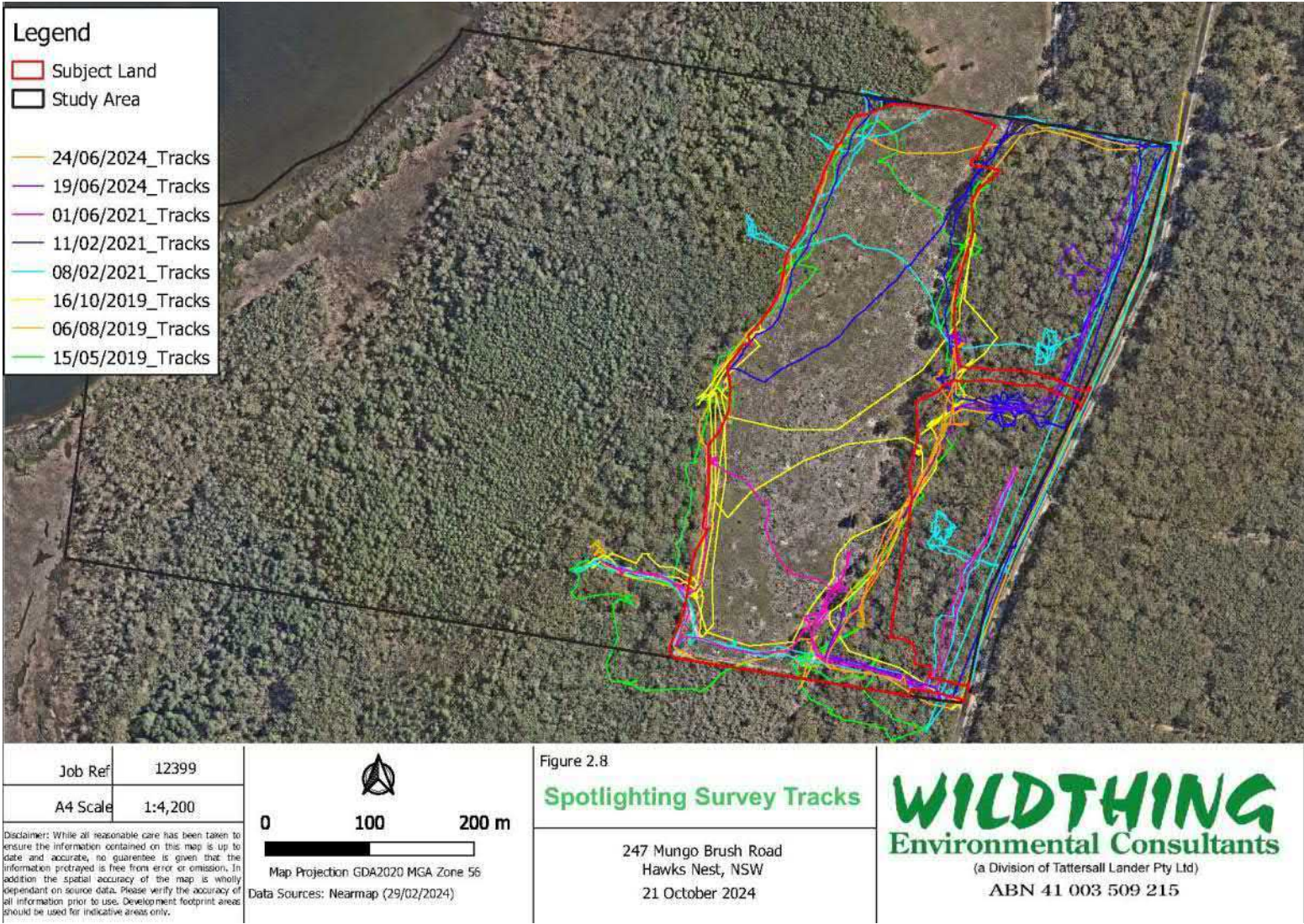




Figure 2.9 Stagwatching, Harp Trapping, Stationary Anabat, Call-playback and Camera Trap Locations



#### 2.4.3.5 Arboreal Mammals

Arboreal mammal surveys targeted the candidate species credit species *Petaurus norfolcensis* (Squirrel Glider), *Phascogale tapoatafa* (Brush-tailed Phascogale) and *Phascolarctos cinereus* (Koala). Surveys included spotlighting and camera trapping.

Ten camera traps (Swift Endruo, Browning Trail Camera & Reconyx Hyperfire cameras) were set up within the subject land at various times between 15 May 2019 to 12 September 2019 and 14 June to 30 July 2024. 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 bait station containing a mixture of oats, peanut butter, honey and a truffle oil mixture. A mixture of honey and water was also sprayed on the trunk of the tree. After 2 weeks the bait stations and trees were re-sprayed with the honey-water mixture. The location of the camera traps within the subject land is shown in Figure 2.9.

Arboreal mammal trapping was undertaken using 12 Elliott Type B traps (15 x 15 x 46cm) and 8 PVC Tube Traps (Winning & King, 2008) within the study area in October 2019 to determine the presence of arboreal mammals, particularly *Petaurus norfolcensis* (Squirrel Glider) and *Phascogale tapoatafa* (Brush-tailed Phascogale) which is known to occur in similar habitats in the local area (DPIE, 2019). The traps were left in place for four consecutive nights giving a total of 80 arboreal trap nights. The traps were placed at least 2m above the ground on platforms mounted on tree trunks. The targeted trees contained hollows, were flowering or had scratches present on the boles. The baits used consisted of a rolled oats and honey mixture, peanut butter and an aniseed ring (sugar coated sweet). 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. The position of the arboreal traps within the study area can be seen in Figure 2.10.

Spotlighting was undertaken on foot using 100watt hand-held spotlights and high-powered head torches. The spotlighting involved walking at a slow pace along tracks and trails within the subject land area and stopping every 2 minutes, allowing the observer to hear movements of animals. Targeted candidate species targeted included *Petaurus norfolcensis* (Squirrel Glider) and *Phascolarctos cinereus* (Koala). The location of the spotlighting routes within the subject land is shown in Figure 2.8.





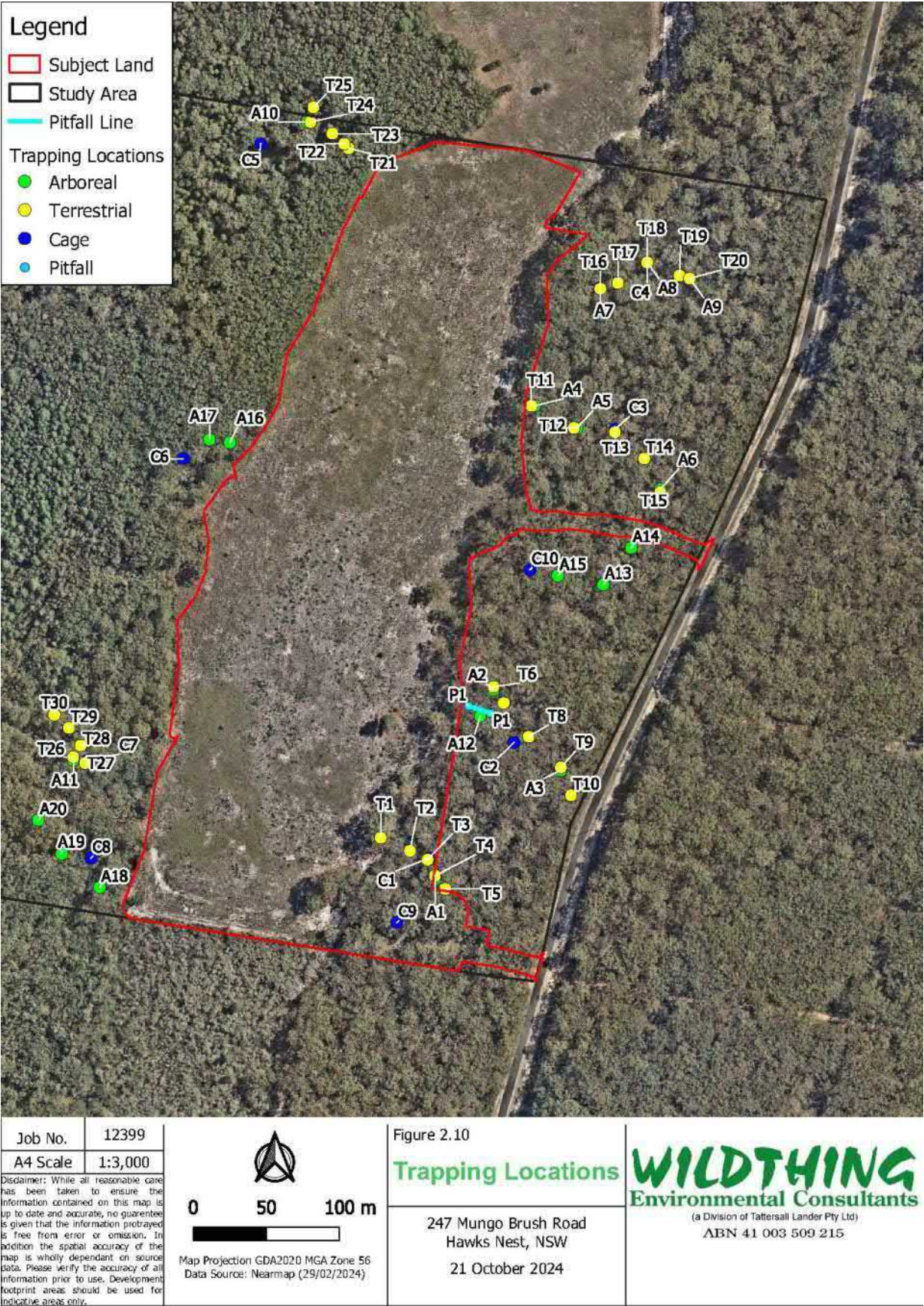
**Plate 2.7: Elliott B – Arboreal Trap.**



**Plate 2.8: PVC – Arboreal Trap.**



Figure 2.10 Trapping Locations





#### 2.4.3.6 Terrestrial Mammals

Terrestrial mammal surveys targeted the candidate species credit species *Planigale maculata* (Common Planigale) and *Cercartetus nanus* (Eastern Pygmy Possum). Surveys involved camera trapping, spotlighting and trapping.

Six camera traps (Swift Endruo, Reconyx Hyperfire and Signify cameras) were set at a height below 1m, targeting terrestrial mammal species within the subject land at various times between 15 May 2019 to 12 September 2019 and 14 June to 30 July 2024. Cameras were 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 2.9.

##### Small terrestrial mammal trapping

Small terrestrial mammal trapping was undertaken using 30 Elliott Type A traps (8x10x33cm) within the study area in October 2019. The traps were left in place for four consecutive nights giving a total of 120 small 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 baits used for the traps were a mixture of rolled oats and honey, Good-O's (dry dog food) and peanut butter. The traps were checked early each morning and, where necessary, reset and rebaited. The location of the small terrestrial traps lines is shown in Figure 2.10.

##### Medium terrestrial mammal trapping

Medium terrestrial mammal trapping was undertaken using 10 cage traps (60x35x40cm) within the study area in October 2019. The traps were left in place for four consecutive nights giving a total of 40 medium 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 were raw chicken wings. The traps were checked early each morning and where necessary, reset and rebaited. The traps were checked early each morning and, where necessary, reset and rebaited. The location of the medium terrestrial trap lines is shown in Figure 2.10.



**Plate 2.7: Cage Trap**

#### *2.4.3.7 Microchiropteran Bat Survey*

The microchiropteran bat surveys involving bat call detection were undertaken on 16 May 2019, 6 August 2019, 16 October 2029 and 11 February 2021. 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. The bat calls recorded by Wildthing Environmental Consultants were analysed in-house by Mungo Worth. The location of the stationary microchiropteran bat call surveys is shown in Figure 2.9.

#### *2.4.3.8 Microchiropteran Bat Harp Trapping*

Two monofilament harp traps were set over 3 nights within the study area in October 2019 giving a total of 6 harp trap nights. 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 Trap locations are shown in Figure 2.9.





**Plate 2.8: Harp Trap.**

#### *2.4.3.9 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.
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.

Five-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. The location of the SAT surveys is shown in Appendix G Figure G1.

#### *2.4.3.10 Incidental Observations and Secondary Indications*

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

## 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
Retrieve Remote Cameras	Wednesday 7/08/2024	1100 - 1200	1.0 (1 person)	14.9°C	13km/hr NW		1/8 Cloud, 67% Relative Humidity
Targeted Flora Survey	Thursday 30/07/2024	1300 – 1730	4.5 (1 person)	15°C	32km/hr SSW	Raining	7/8 Cloud, 59% Relative Humidity
Listen on dusk for owls Owl call-playback		1730 - 1830	1.0 (1 person)	12.3°C	33km/hr SW	Raining	8/8 Cloud, 73%Relative Humidity
Targeted Flora Survey Spray honey water on camera bait stations Significant Tree Survey	Friday 19/07/2024	930 – 1600	16.5 (3 persons)	12.5°C	30km/hr WNW		0/8 Cloud, 53% Relative Humidity
Targeted Flora Surveys Rebait Cameras Significant Tree Survey	Monday 15/07/2024	1115 – 1545	13.5 (3 persons)	12°C	50km/hr WNW		0/8 Cloud, 50% Relative Humidity
Set Remote Cameras	Wednesday 3/07/2024	1215 – 1545	7.0 (2 persons)	15.4 °C	19km/hr S	0mm since 9am	4/8 Cloud, 75% Relative Humidity
Listen on dusk for owls Owl call-playback	Monday 24/06/2024	1630 - 1930	3.0 (1 person)	13 °C	3km/hr SW		0/8 Cloud, 81% Relative Humidity
Spotlight Set Cameras Listen on dusk for owls Rebait Cameras Owl call-playback Spotlight	Wednesday 19/06/2024	1715 – 1800  1815 – 1915	0.75 (1 person)  1.0 (1 person)	11 °C	11km/hr SW		0/8 Cloud, 68% 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
Set Cameras Set Song Meter	Friday 14/07/2024	0930 – 1030	1.0 (1 person)	14 °C	13km/hr NW		7/8 Cloud, 79% Relative Humidity
Investigating alternative position for northern access road. Incidental observations.	Tuesday 8/06/2021	1445 - 1530	1.75	26°C	Mod		3/8 cloud, Wind ENE 22km/h, 26°C, 47% humidity
Listen on dusk for owls Owl call-playback Spotlight	Tuesday 1/06/2021	1650 - 1850	2.0 (1 person)	16°C	Light		4/8 cloud, Wind NE 6km/h, 16°C, 85% humidity, no moon observed.  4/8 cloud, Wind NE 6km/h, 14°C, 97% humidity. No moon seen.
Avifauna survey Listen on dusk for owls Owl call-playback	Monday 18/05/2021	1630 - 1930	1.5 (1 person)	17°C	Light		0/8 cloud, Wind ESE 9km/h, 17°C, 57% humidity  0/8 cloud, Calm, 15.5°C, 68% humidity, 3/8 Moon.
Amphibian Survey	Wednesday 31/3/2021	1700 – 1800	1.0 (1 person)	20 °C		Intermittent showers	6/8 Cloud, 68% Relative Humidity
Koala Spot Assessment Technique (SAT) Amphibian Survey Spotlighting and Bat call survey.	Thursday 11/02/2021	1700-1830 1945 – 2115	1.5 1.5	26°C	Mod		3/8 cloud, Wind ENE 22km/h, 26°C, 47% humidity  3/8 cloud, Wind NE 19km/h, 22°C, 57% humidity
Koala Spot Assessment Technique (SAT) Amphibian Survey	Monday 08/02/2021	1500 – 1830 1945 - 2115	3.5 1.5	22°C	Mod		2/8 cloud, Wind SSE 22km/h, 22°C, 73% 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
Spotlighting and Bat call survey.							2/8 cloud, Wind SSE 16km/h, 20°C, 75% humidity
Preclearance survey for eastern fence line boundary clearance. Incidental observations.	Thursday 8/10/2020	0700 - 0930	2.5		Calm		2/8 cloud,
Hollow-bearing Tree Survey, Koala Feed Tree Surveys and scat searches. Targeted flora surveys.	Thursday 28/11/2019	0900 - 1400	5.0	21	Light		2/8 cloud, Wind ENE 6km/h, 21°C, 58% humidity, Smoke Haze
BAM Plots	Friday 22/11/2019	0900 - 1200	3.0	31°C	Light		2/8 cloud, Wind NW 13km/h, 31°C, 37% humidity, Smoke Haze.
Incidental surveys, vegetation surveys far west of study area.	Wednesday 20/11/2019	0930 - 1200	2.5	21°C	Mod		0/8 cloud, Wind SSW 30km/h, 21°C, 64% humidity,
Checking Traps, Trap retrieval & Incidental observations.	Friday 18/10/2019	0530- 0900	3.0	17°C	Mod		0/8 cloud, Wind WNW 17km/h, 13°C, 40% humidity, Moon 7/8.
Checking Traps Avifauna Survey	Thursday 17/10/2019	0530 - 0800	2.0	15°C	Mod		0/8 cloud, Wind SE 19km/h, 15°C, 81% humidity, Moon 7/8.
Checking traps. Incidental observations Check Pitfall Trap Set two Harp Traps Avifauna Survey Spotlighting/Mobile Bat call survey. Owl, Bush Stone-curlew & Mammal Call Playback. Amphibian Survey. Stationary Bat Call Survey (Anabat	Wednesday 16/10/2019	0600 – 0800 1600 – 1630 1630-1700 1800 – 1830 1900 - 2130	2.0 0.5 0.5 0.5 2.5	20°C	Mod		5/8 cloud, Wind SE 19km/h, 20°C, 81% humidity.  8/8 cloud, Wind ESE 7km/h, 19°C, 92% humidity, Storm and rain early in evening.

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
left out all night).							
Checking traps. Incidental observations Avifauna Survey	Tuesday 15/10/2019	0600 - 0800	2.0 0.5	18°C	Light		1/8 cloud, Wind ESE 7km/h, 18°C, 95% humidity, Moon 8/8.
Fauna Trap deployment Incidental observations	Monday 14/10/2019	0900 - 1530	6.5 Three persons	18	Light		3/8 cloud, Wind ESE 7km/h, 18°C, 63% humidity.
Targeted flora searches Searches under Koala Feed Tree species within study area.	Wednesday 2/10/2019	0900 – 1200 1200 - 1300	3.0 (two persons) 1.0	17	Mod		1/8 cloud, Wind WNW 15km/h, 17°C, 71% humidity.
Targeted flora searches	Thursday 12/09/2019	0900 - 1200	3.0	15	Light		1/8 cloud, Wind west 6km/h, 15°C, 72% humidity.
Avifauna Survey Relocate Camera Traps	Thursday 5/09/2019	1030 - 1100	1.0	20°C	Light		0/8 cloud, Wind southerly 9km/h, 20°C, 61% humidity.
BAM Plot Targeted flora searches	Friday 16/08/2019	0930 – 1100 1100 - 1430	1.5 2.5 (Two Persons)	23°C	Mod		0/8 cloud, Wind WNW 33km/h, 23°C, 16% humidity.
Retrieval of Anabat/Incidental observations	Wednesday 7/08/2019	0700 - 0730	0.25		Light		
Vegetation Mapping/Incidental observations Rebait relocate Camera Traps Avifauna Survey Stag Watching Amphibian Survey Spotlighting/Mobile Bat call survey. Owl, Bush Stone-curlew & Mammal Call Playback Stationary Bat Call Survey (Anabat left out all night).	Tuesday 6/08/2019	1400 – 1600  1700 - 1730	2.0  0.5	19°C	Light		0/8 cloud, N 11km/h, 19°C, 30% humidity.  0/8 cloud, N 11km/h, 17°C, 49% humidity, Moon 3/8.
Avifauna Survey Targeted flora searches.	Thursday 13/06/2019	0900 - 0930 0930 - 1330	0.5 4.0	17°C	Light		4/8 cloud, WSW breeze 6km/h, 17°C,

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
							75% humidity.
Retrieval of Anabat/Incidental observations Avifauna Survey	Thursday 16/05/2019	0800 – 0830 0830 - 0930	0.5	12°C	Light		4/8 cloud, WNW breeze 6km/h, 12°C, 96% humidity.
Set up two Remote Camera Traps Vegetation Mapping/Incidental observations Avifauna Survey Amphibian Survey Spotlighting/Mobile Bat call survey. Owl, Bush Stone-curlew & Mammal Call Playback Stationary Bat Call Survey (Anabat left out all night).	Wednesday 15/05/2019	1400 – 1500  1630 – 1700  1700 - 1930	1.0  0.5  2.5	22°C	Mod		2/8 cloud, E breeze 13km/h, 22°C, 60% humidity.  0/8 cloud, Easterly breeze 7km/h, 22°C, 60% humidity, Moon 7/8.



## 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 942.18ha. 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 study area is located within the NSW North Coast (NNC) IBRA Bioregion and the Karuah Manning IBRA Subregion (OEH 2016b). Both IBRA and IBRA Subregional Boundaries do not occur near the study area and hence are not shown within Figure 3.1.

#### 3.2.2 Rivers, streams, estuaries and wetlands

The subject land occurs within the greater Hunter River Catchment. The study area is located within the Hunter Central Rivers Catchment. According to the NSW Government SEED mapping no streams were present within the study area. The estuarine Myall River formed the western boundary of the study area. The study area is located in close proximity (approximately 500m to the west) to Myall River, this area is mapped as part of the greater Port Stephens Estuary, which is included in the Directory of Important Wetlands of Australia (DIWA) (DoEE 2018c).

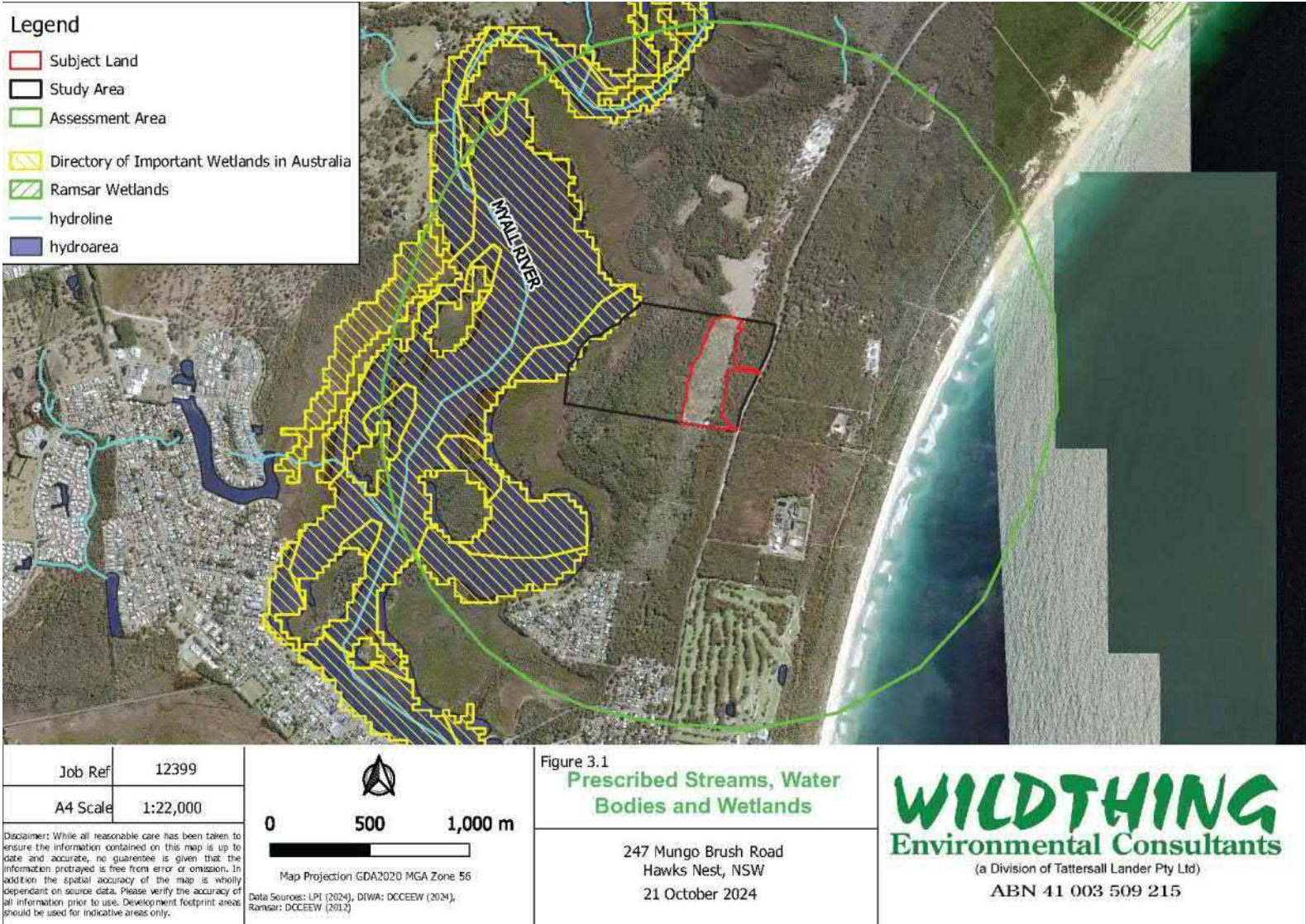
The Port Stephens Estuary is 30 253 hectares in area and was listed on the DIWA for the following reasons:

- It is a good example of a wetland type occurring within a biogeographic region in Australia.
- It is a wetland which is important as the habitat for animal taxa at a vulnerable stage in their life cycles, or provides a refuge when adverse conditions such as drought prevail.
- The wetland supports native plant or animal taxa or communities which are considered endangered or vulnerable at the national level.

The study area is also located to the south of the Ramsar listed wetland Myall Lakes. Ramsar wetlands are representative, rare or unique wetlands, or are important for conserving biological diversity.

Prescribed streams within the Assessment Area are shown in Figure 3.1.

Figure 3.1 Assessment area showing Prescribed Streams and Water Bodies





### **3.2.3 Habitat connectivity**

The entire eastern portion of the study area including the subject land was mapped as a regional corridor in NE NSW (NPWS 2003) (Figure 3.2). A large portion of the study area was also mapped as key habitat (NPWS 2003). Habitat within the study area formed part of a much larger area of key habitat. Key habitats define areas identified as centres of high native species diversity for a range of fauna assemblages (NPWS, 2003). The majority of the subject land was not mapped as Key Habitat. The proposal will result in the removal of a small amount of key habitat. Small areas of the fauna corridor will also be impacted.

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

No significant geological features were present within the subject land and study area.

### **3.2.5 Areas of outstanding biodiversity value**

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

### **3.2.6 BioNet Landscapes NSW**

The study area falls entirely within the Myall - Forster Barrier BioNet Landscape (formerly Mitchell Landscapes) (OEH 2016a).

### **3.2.7 Geology and Soils**

The study area is located on the Port Stephens soil landscape and is composed of undulating to rolling low hills on mudstones and minor interbeds of lithic sandstones of the Wootton Beds NSW (NSW DCCEEW, 2024f). There are no karst, caves, cliffs or other areas of geological significance within the study area or within the surrounding assessment area. A map of the study area showing the location of the soil landscapes within the study area is shown in Figure 3.3.

### **3.2.8 Important Areas Map**

The Important Areas Map was consulted and no Important Areas were mapped within the subject land. Migratory Shorebird Important Areas was found to be mapped on the western boundary of the study area outside of the subject land (Figure 3.3).

Figure 3.2 Assessment area showing Fauna Corridors and Key Habitat

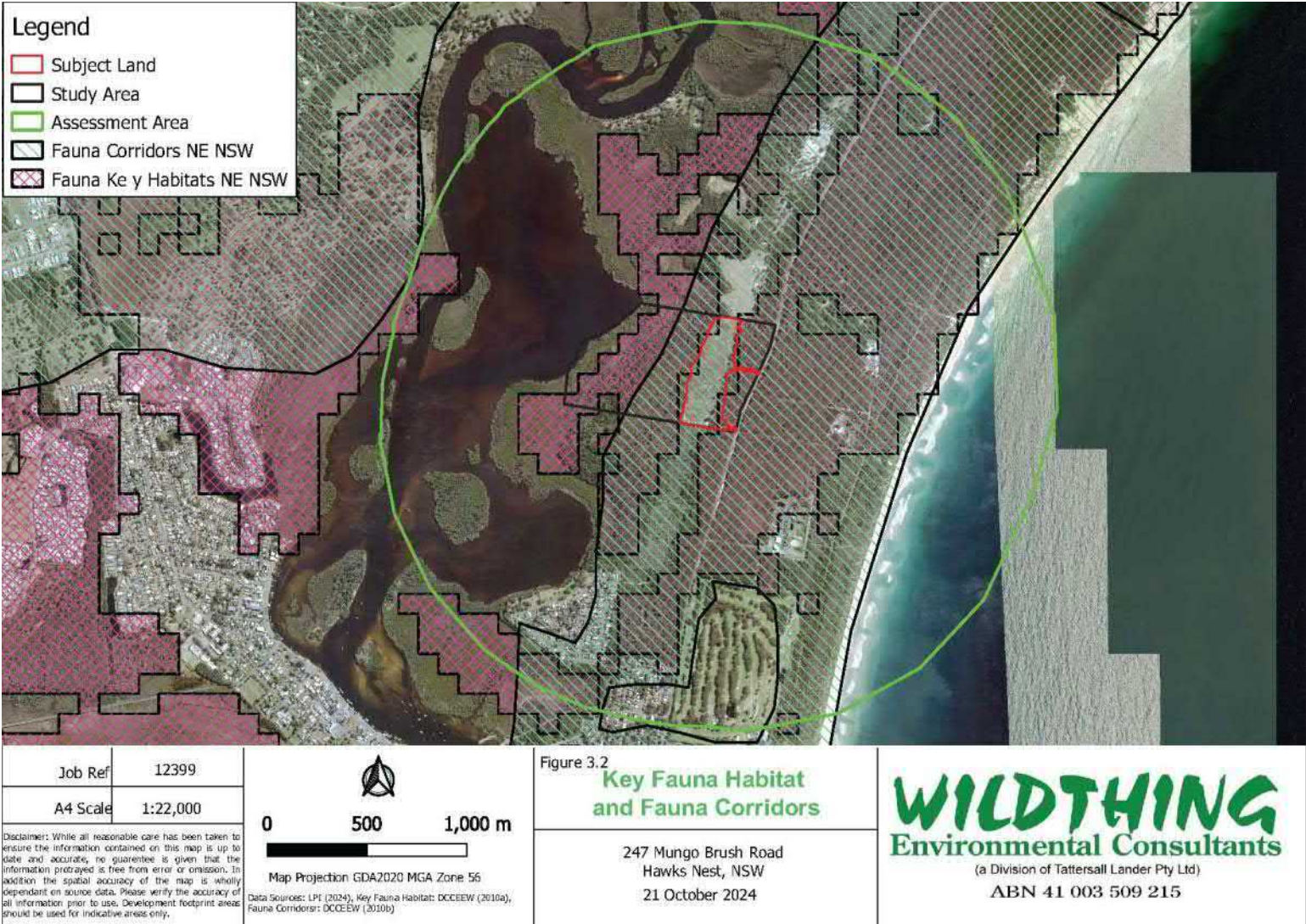




Figure 3.3 Soil Landscapes within the Study Area





Figure 3.4 Important Areas Map – Migratory Seabirds



### 3.3 Native vegetation cover

Approximately 587.56ha of native vegetation was mapped within the 942.18ha 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 62.36 (62%) and falls within the >30-70% class according to the BAM (2020c). 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)	942.18
Total area of native vegetation cover (ha)	587.56
Percentage of native vegetation cover (%)	62.36
Class (0-10, >10-30, >30-70 or >70%)	>30-70

### 3.4 Past and current disturbance to native vegetation

The vegetation within the site had been subject to disturbances from past vegetation removal as a result of past sand mining as well as ongoing slashing of ground vegetation within the footprint of the past sand mining. The proposal has been positioned predominantly on an area that is highly disturbed as a result of previous sand mining.



Figure 3.5 Native vegetation mapped within the assessment area





## **4.0 Native vegetation, threatened ecological communities and vegetation integrity**

### **4.1 Native vegetation extent**

Approximately 587.56ha of native vegetation was mapped within the 942.18ha assessment area (Native vegetation cover within the assessment area is approximately 62.36% and falls within Class b. >30-70% according to the BAM (2020c). Figure 4.1 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.

#### **4.1.2 Areas that are not native vegetation**

No areas of non-native vegetation were present within the subject land or study area.

## 4.2 Plant Community Types

### 4.2.1 Overview

Vegetation within the study area has been assessed as aligning with the BioNet Vegetation Classification Plant Community Types (PCTs) identified within Table 4.1 and their extent is shown in Figure 4.2. 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 each PCT are provided in the following subsections.

The entire 46.80ha study area contained native vegetation. A total of five PCT's were identified within the study area and are shown in Table 4.1.

**Table 4.1 PCTs identified and extent within the study area**

PCT ID	PCT name	Subject Land (ha)	Study Area (ha)
3544	Coastal Sands Apple-Blackbutt Forest	10.30	18.97
4006	Northern Paperbark-Swamp Mahogany Saw-sedge Forest	0	16.08
4000	Northern Estuarine Paperbark Sedge Forest	0	7.24
4026	Estuarine Swamp Oak Twig-rush Forest	0	1.88
4091	Grey Mangrove-River Mangrove Forest	0	2.63
Total area		10.30	46.80

#### 4.2.1.1 PCT 3544 - Coastal Sands Apple-Blackbutt Forest

**Table 4.2 PCT 3544 - Coastal Sands Apple-Blackbutt Forest**

PCT 3544 - Coastal Sands Apple-Blackbutt Forest		
PCT ID	PCT 3544	
PCT name	Coastal Sands Apple-Blackbutt Forest	
Equivalent Old PCT ID & Name	PCT 1648 - Smooth-barked Apple - Blackbutt heathy open forest of the Tomaree Peninsula	
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)	
Vegetation Class	Coastal Dune Dry Sclerophyll Forests	
Per cent cleared value (%)	21.67	
Extent within the Study Area (ha)	18.97ha	
Extent within subject land (ha)	10.30ha	
Justification of PCT selection	Potential PCTs were identified by filtering through the BioNet Vegetation Classification Bulk Export Data of all PCTs (NSW DCCEEV 2024c). The following filters were applied:	
	Filter	Selection

PCT 3544 - Coastal Sands Apple-Blackbutt Forest		
	IBRA Region	NSW North Coast
	IBRA Subregion	Karuah Manning
	Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
	Upper Stratum	Eucalyptus pilularis
	The following PCTs remained: 3544, 3545, 3546, 3549, 3581, 3582.	
	Of these PCTs, 3544 was the most consistent as a result of the high cover of <i>Eucalyptus pilularis</i> (Blackbutt) and mid-story of <i>Banksia serrata</i> (Old Man Banksia).	
Description of PCT 3544 within the subject land	<p>PCT 3544 was present within the eastern portion of the study area and occurred over the entirety of the subject land (impact area) in various degrees of disturbance. The most common canopy species were <i>Eucalyptus pilularis</i> (Blackbutt), <i>Angophora costata</i> (Smooth-barked Apple) and <i>Corymbia gummifera</i> (Red Bloodwood). <i>Eucalyptus piperita</i> (Sydney Peppermint) was also present in lower numbers. Common mid-storey species were <i>Banksia serrata</i> (Old Man Banksia) and <i>Nematolepis squamea</i> (Satinwood). The shrub layer was diverse and included species such as <i>Bossiaea rhombifolia</i>, <i>Leucopogon lanceolatus</i> (Lance Beard Heath), <i>Monotoca elliptica</i> (Tree Broom Heath) and <i>Leptospermum polygalifolium</i> subsp. <i>polygalifolium</i> (Teatree).</p> <p>Common groundcovers included <i>Pteridium esculentum</i> (Bracken Fern), <i>Lomandra longifolia</i> (Spiny Mat Rush), <i>Pomax umbellata</i> (Pomax) and <i>Themeda australis</i> (Kangaroo Grass).</p> <p><i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> (Bitou Bush) was a common introduced plant species within this PCT. Other weed species recorded included <i>Lantana camara</i> (Lantana).</p>	
Condition States	Three condition states were present; Good, Moderate, and Derived.	
BC Act Status	Does not align with any TEC's.	
EPBC Act Status	Does not align with any TEC's.	
Photos examples of PCT 3544 within the subject land are shown in Plates 4.1 – 4.4.		



**PCT 3544 - Coastal Sands Apple-Blackbutt Forest**



**Plate 4.1: PCT 3544 - Coastal Sands Apple-Blackbutt Forest (Good Condition)**



**Plate 4.2: PCT 3544 - Coastal Sands Apple-Blackbutt Forest (Good Condition).**



**PCT 3544 - Coastal Sands Apple-Blackbutt Forest**



**Plate 4.3: PCT 3544 - Coastal Sands Apple-Blackbutt Forest (Moderate Condition)**



**Plate 4.4: PCT 3544 - Coastal Sands Apple-Blackbutt Forest (derived)**

4.2.1.2 PCT 4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest

**Table 4.3 PCT 4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest**

PCT 4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest	
PCT ID	PCT 4006
PCT name	Northern Paperbark-Swamp Mahogany Saw-sedge Forest
Equivalent Old PCT ID & Name	PCT 1725 - Swamp Mahogany - Broad-leaved Paperbark - Swamp Water Fern - Plume Rush swamp forest on coastal lowlands of the Central Coast and Lower North Coast.
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Swamp Forests
Per cent cleared value (%)	22.61
Extent within the Study Area (ha)	16.08ha
Extent within the Subject Land (ha)	0ha
Description of PCT 4006 within the subject land	<p>PCT 4006 Northern Paperbark-Swamp Mahogany Saw-sedge Forest was present within the central area of the study area to the west of the subject land. The dominant canopy species were <i>Melaleuca quinquenervia</i> (Broad-leaved Paperbark) and <i>Eucalyptus robusta</i> (Swamp Mahogany). The composition of these two canopy species varied across this PCT. Other canopy species present included <i>Casuarina glauca</i> (Swamp Oak). Common mid-stratum trees were <i>Glochidion ferdinandi</i> (Cheese Tree) and <i>Livistona australis</i> (Cabbage Tree Palm). Shrub species were <i>Breynia oblongifolia</i> (Breynia), <i>Homalanthus populifolius</i> (Bleeding Heart) and <i>Elaeocarpus reticulatus</i> (Blueberry Ash).</p> <p>The ground layer also varied across the PCT. Common groundcovers were <i>Gahnia clarkei</i> (Tall Saw-sedge) <i>Baloskion tetraphyllum</i>, and fern species <i>Telmatoblechnum indicum</i> (Swamp Water Fern), <i>Hypolepis muelleri</i> (Harsh Ground Fern) and <i>Pteridium esculentum</i> (Bracken Fern).</p> <p><i>Parsonsia straminea</i> (Common Silkpod) was a common climber. Other climbers recorded included <i>Hibbertia scandens</i> (Climbing Guinea Flower).</p> <p>Common weed species included <i>Lantana camara</i> (Lantana) and <i>Pinus elliotii</i> (Slash Pine).</p>
Condition States	Good Condition
BC Act Status	Endangered Ecological Community - Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.
EPBC Act Status	Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland
Photos examples of PCT 4006 within the study area are shown in Plates 4.5 – 4.6.	



**PCT 4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest**



**Plate 4.5: PCT 4006 Northern Paperbark-Swamp Mahogany Saw-sedge Forest**



**Plate 4.6: PCT 4006 Northern Paperbark-Swamp Mahogany Saw-sedge Forest**

4.2.1.3 PCT 4000 - Northern Estuarine Paperbark Sedge Forest

**Table 4.4 PCT 4000 - Northern Estuarine Paperbark Sedge Forest**

PCT 4000 - Northern Estuarine Paperbark Sedge Forest	
PCT ID	PCT 4000
PCT name	Northern Estuarine Paperbark Sedge Forest
Equivalent Old PCT ID & Name	PCT 1724 - Broad-leaved Paperbark - Swamp Oak - Saw Sedge swamp forest on coastal lowlands of the Central Coast and Lower North Coast
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Swamp Forests
Per cent cleared value (%)	34.89
Extent within study area (ha)	7.24ha
Extent within subject land (ha)	0ha
Description of PCT 4000 within the subject land	<p>PCT 4000 Northern Estuarine Paperbark Sedge Forest was present within the west of the study area. The dominant canopy species were <i>Melaleuca quinquenervia</i> (Broad-leaved Paperbark) and <i>Casuarina glauca</i> (Swamp Oak).</p> <p>Common groundcovers were <i>Machaerina juncea</i> (Bare Twig-rush) and <i>Juncus kraussii</i> subsp. <i>australiensis</i> (Sea Rush). Other groundcovers included <i>Phragmites australis</i> (Australian Reed) and <i>Gahnia clarkei</i> (Tall Saw-sedge)</p> <p><i>Parsonsia straminea</i> (Common Silkpod) was a common climber.</p> <p>Common weed species included <i>Lantana camara</i> (Lantana), <i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> (Bitou Bush), <i>Pinus elliottii</i> (Slash Pine) and <i>Asparagus aethiopicus</i> (Ground Asparagus).</p>
Condition States	Good Condition
BC Act Status	Endangered Ecological Community - Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.
EPBC Act Status	Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland
Photos examples of PCT 4000 within the subject land are shown in Plates 4.7 – 4.8.	



**PCT 4000 - Northern Estuarine Paperbark Sedge Forest**



**Plate 4.7: PCT 4000 - Northern Estuarine Paperbark Sedge Forest**



**Plate 4.8: PCT 4000 - Northern Estuarine Paperbark Sedge Forest**



4.2.1.4 PCT 4028 - Estuarine Swamp Oak Twig-rush Forest

**Table 4.5 PCT 4026 - Estuarine Sea Rush Swamp Oak Forest**

PCT 4026 - Estuarine Sea Rush Swamp Oak Forest	
PCT ID	PCT 4026
PCT name	Estuarine Sea Rush Swamp Oak Forest
Equivalent Old PCT ID & Name	PCT 1808 - Estuarine Reedland
Vegetation Formation	Forested Wetlands
Vegetation Class	Coastal Floodplain Wetlands
Per cent cleared value (%)	69.74
Extent within study area (ha)	1.88ha
Extent within the subject land (ha)	0ha
Description of PCT 4026 within the subject land	PCT 4026 - Estuarine Sea Rush Swamp Oak Forest was located in the far west of the study area. The majority of the PCT was characterised by a dense ground layer of <i>Machaerina juncea</i> (Bare Twig-rush), <i>Juncus kraussii</i> subsp. <i>australiensis</i> (Sea Rush) and <i>Sporobolus virginicus</i> (Sand Couch). Other ground covers included <i>Phragmites australis</i> (Australian Reed) and <i>Samolus repens</i> (Creeping Brookweed). This PCT contained a sparse tree layer of <i>Casuarina glauca</i> (Swamp Oak).
Condition States	Good Condition
BC Act Status	Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions
EPBC Act Status	Coastal Swamp Oak ( <i>Casuarina glauca</i> ) Forest of New South Wales and South East Queensland ecological community
Photos examples of PCT 4026 within the subject land are shown in Plates 4.9 – 4.10.	

**PCT 4026 - Estuarine Sea Rush Swamp Oak Forest**



**Plate 4.9: PCT 4026 Estuarine Sea Rush Swamp Oak Forest**



**Plate 4.10: PCT 4026 Estuarine Sea Rush Swamp Oak Forest**

4.2.1.5 PCT 4091 - Grey Mangrove-River Mangrove Forest

**Table 4.6 PCT 4091 - Grey Mangrove-River Mangrove Forest**

PCT 4091 - Grey Mangrove-River Mangrove Forest	
PCT ID	PCT 4091
PCT name	Grey Mangrove-River Mangrove Forest
Equivalent Old PCT ID & Name	PCT 1747 - Grey Mangrove low closed forest
Vegetation Formation	Saline Wetlands
Vegetation Class	Mangrove Swamps
Per cent cleared value (%)	52.96
Extent within the study area (ha)	2.63ha
Extent within the subject land (ha)	0ha
Description of PCT 4091 within the study area	<i>Avicennia marina</i> subsp. <i>australasica</i> (Grey Mangrove) was the only tree species present. The ground was composed largely of bare mud. Some species of <i>Juncus kraussii</i> subsp. <i>australiensis</i> (Sea Rush)
Condition States	Good Condition
BC Act Status	No associated TEC
EPBC Act Status	No associated TEC

Photos examples of PCT 4091 within the subject land are shown in Plates 4.11 – 4.12.





**PCT 4091 - Grey Mangrove-River Mangrove Forest**

**Plate 4.11: PCT 4026 Estuarine Sea Rush Swamp Oak Forest**



**Plate 4.12: PCT 4026 Estuarine Sea Rush Swamp Oak Forest**

Figure 4.1 PCT's within the study area & subject land



**Legend**

- Subject Land
- Study Area
- PCT 3544 Coastal Sands Apple-Blackbutt Forest (18.97ha)
- PCT 4006 Northern Paperbark-Swamp Mahogany Saw-sedge Forest (16.08ha)
- PCT 4000 Northern Estuarine Paperbark Sedge Forest (7.24ha)
- PCT 4026 Estuarine Sea Rush Swamp Oak Forest (1.88ha)
- PCT 4091 Grey Mangrove-River Mangrove Forest (2.63ha)

Job Ref	12399	  Map Projection: GDA2020 MGA Zone 56 Data Sources: Nearmap (29/02/2024)	Figure 4.1	<p><b>Plant Community Types</b></p> <p>247 Mungo Brush Road Hawks Nest, NSW 21 October 2024</p>	<p><b>WILDTHING</b> Environmental Consultants (a Division of Tattersall Lander Pty Ltd) ABN 41 003 509 215</p>
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.

### 4.3 Threatened ecological communities

Two Endangered Ecological Communities were present within the western portion of the study area, there were:

- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions and Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.
- Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.

Areas of Swamp Oak Floodplain Forest were consistent with the nationally listed Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community.

Areas of Swamp Sclerophyll Forest were consistent with the nationally listed Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland.

There were no Threatened Ecological Communities (TEC's) identified within the subject land.

### 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 one PCT was identified within the subject land:

- PCT 3544 Coastal Sands Apple-Blackbutt Forest (10.30ha)

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.

PCT 3544 was stratified on the basis of the broad presence/absence of key strata over the subject land, vegetation zones were attributed with a vegetation zone ID, which are

- PCT 3544\_Good Condition (1.06ha)
- PCT 3544\_Moderate (0.54ha)
- PCT 3544\_Derived (8.70ha)

Descriptions of each vegetation zone are as follows:



#### **PCT 3544 Good**

Fully structured example of PCT 3544 with native canopy, midstory and groundcover. Dominant canopy species included *Eucalyptus pilularis* (Blackbutt), *Angophora costata* (Smooth-barked Apple) and *Corymbia gummifera* (Red Bloodwood). The mid storey primarily consisted of *Banksia serrata* (Old Man Banksia) and *Nematolepis squamea* (Satinwood). The shrub layer was diverse and included species such as *Bossiaea rhombifolia*, *Leucopogon lanceolatus* (Lance Beard Heath), *Monotoca elliptica* (Tree Broom Heath) and *Leptospermum polygalifolium* subsp. *polygalifolium* (Teatree). Native groundcover included *Pteridium esculentum* (Bracken Fern), *Lomandra longifolia* (Spiny Mat Rush), *Pomax umbellata* (Pomax) and *Themeda australis* (Kangaroo Grass).

Introduced species such as *Chrysanthemoides monilifera* subsp. *rotundata* (Bitou Bush) was common in areas.

#### **PCT 3544 Moderate**

Mature canopy species *Eucalyptus pilularis* (Blackbutt), *Angophora costata* (Smooth-barked Apple) and *Corymbia gummifera* (Red Bloodwood) were present. Mid and shrub layer species were largely absent. *Pteridium esculentum* (Bracken Fern) was a common ground cover species.

#### **PCT 3544 Derived**

Canopy, mid-story most shrub layer absent. Subject to regular slashing. Native groundcover included *Pteridium esculentum* (Bracken Fern) and *Imperata cylindrica* (Blady Grass).

Vegetation Zones within the subject land are identified within Table 4.7 and their extent is shown in Figure 4.2.

### **4.5 Patch Size**

The patch for each vegetation zone was determined by assessing aerial imagery and existing vegetation mapping to determine the area of native vegetation that has a gap of less than 100 m from the next area of native vegetation (or  $\leq 30$  m for non-woody ecosystems). This included native vegetation within and outside of the subject land. The patch area was then assigned to the appropriate size category:

- a. <5 ha
- b. 5–<25 ha
- c. 25–<100 ha
- d.  $\geq 100$  ha.

Areas included in patch size determination have been highlighted in Figure 4.3

Figure 4.2 Vegetation Zones within the subject land

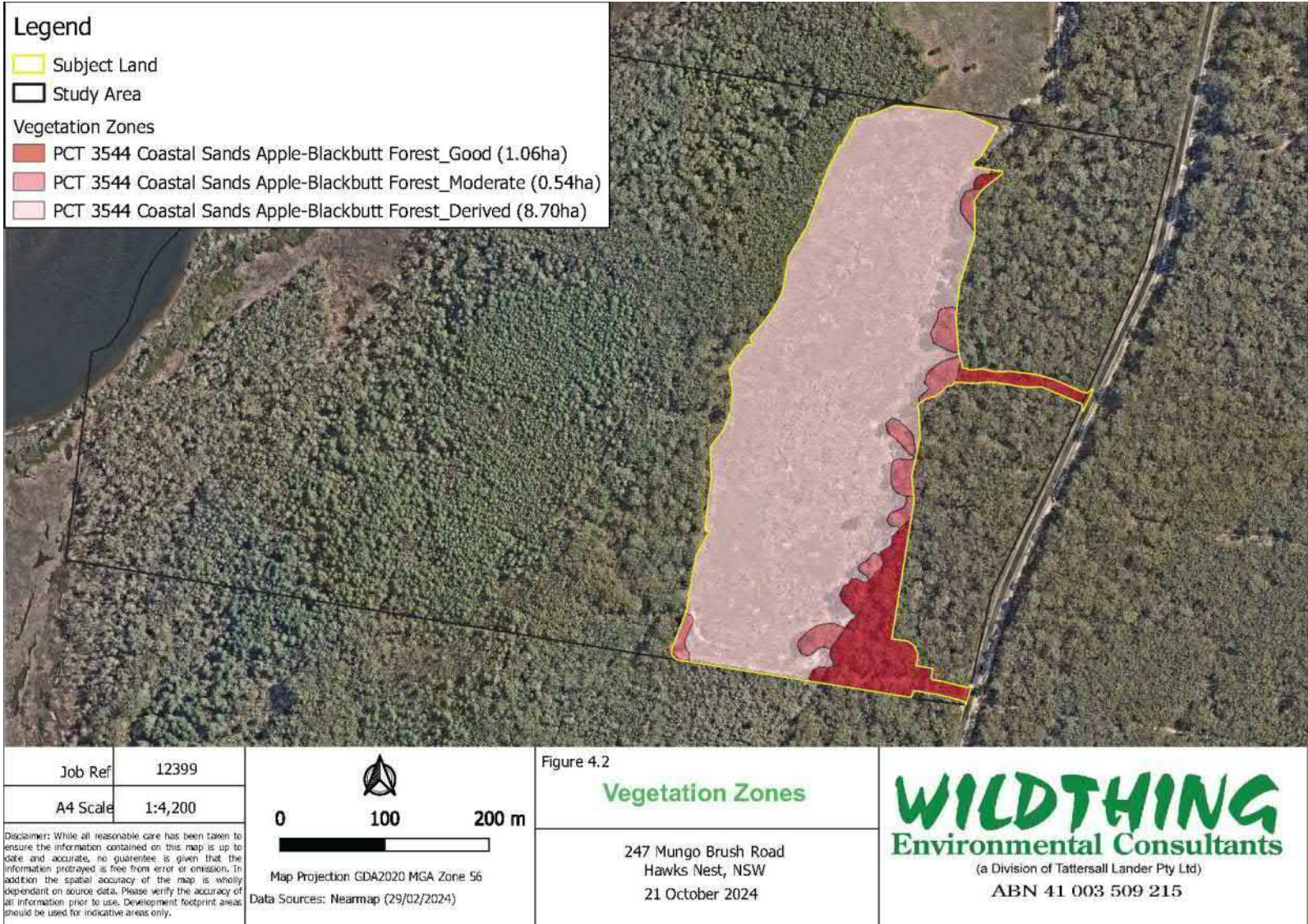
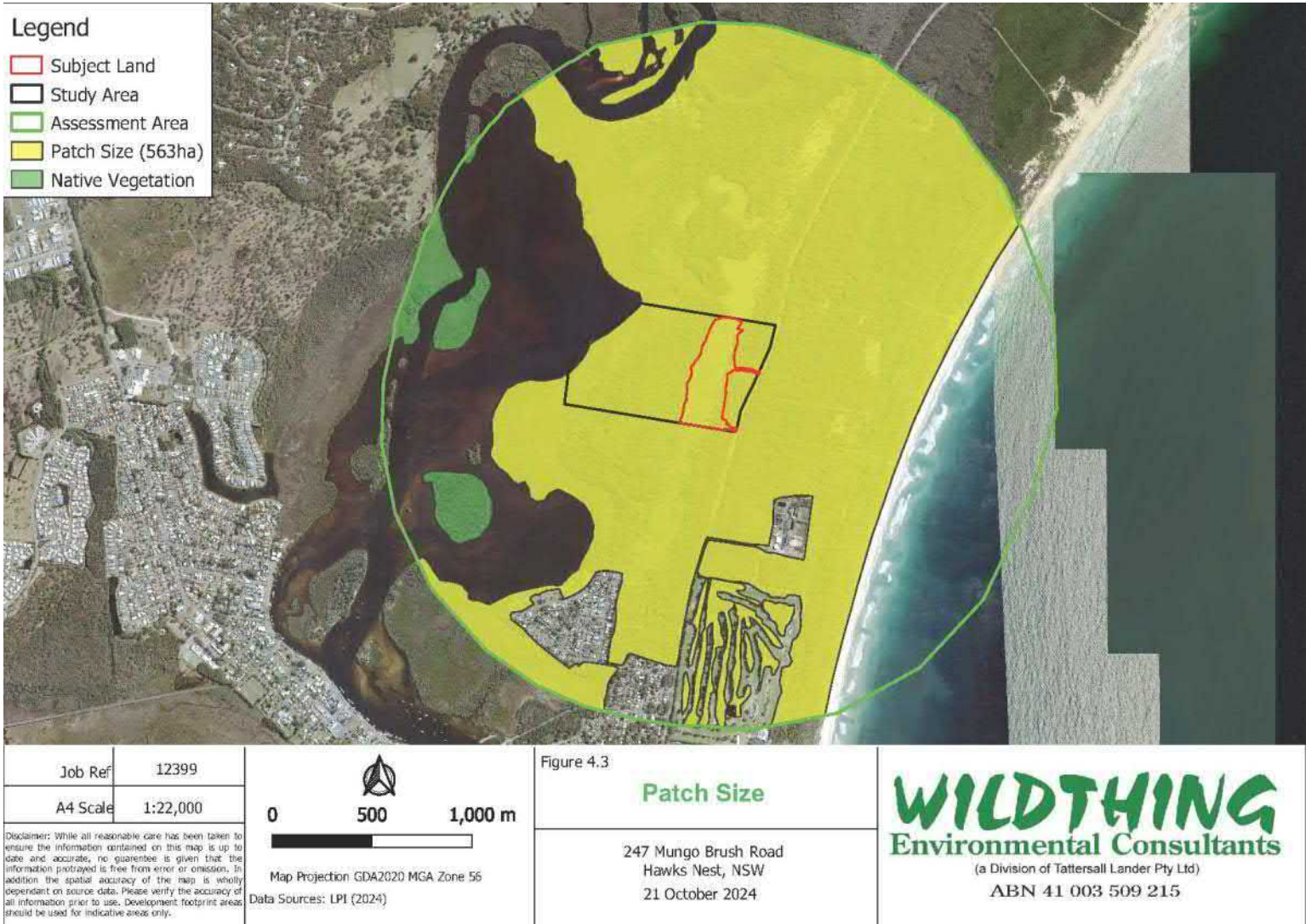




Figure 4.3 Patch Size determination





**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 3544 Coastal Sands Apple-Blackbutt Forest	Good Condition	1.06	<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	
2	PCT 3544 Coastal Sands Apple-Blackbutt Forest	Moderate	0.54	<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	
3	PCT 3544 Coastal Sands Apple-Blackbutt Forest	Derived	8.70	<input type="checkbox"/> <5 ha <input type="checkbox"/> 5–24 ha <input type="checkbox"/> 25–100 ha <input checked="" type="checkbox"/> >100 ha	3	3	3	

## 4.6 Vegetation integrity (vegetation condition)

### 4.6.1 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.

### 4.6.2 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 3544_Good Condition	59.3	64.6	68	63.9	Yes
PCT 3544_Moderate	46.1	23.7	70.1	42.5	Yes
PCT 3544_Derived	21.7	4.5	19.1	12.3	No

### 4.6.3 Management Zones

As the current proposal is for total clearing no management zones were assigned to the vegetation zones.

## 4.7 Tree Survey

Six 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. A few medium sized stick nests were observed to the east of the subject land and one was observed within the subject land. Two species of koala use trees *Eucalyptus robusta* (Swamp Mahogany) and *Eucalyptus microcorys* (Tallowwood) were found to occur within and in proximity to the subject land. The location of significant trees within the subject land and within close proximity are shown in are shown in Figure 4.4. The details of surveyed habitat trees and koala use trees within the subject land and east of the subject land are presented in Appendix I.

## 4.8 Movement Corridors

The entire eastern portion of the study area including the subject land was mapped as a regional corridor in NE NSW (NPWS 2003) (Figure 3.2). A large portion of the study area (on either side of the subject land) was also mapped as key habitat (NPWS 2003). Habitat within the study area formed part of a much larger area of key habitat (Figure 3.2). Key habitats define areas identified as centres of high native species diversity for a range of fauna assemblages (NPWS 2003). The majority of the subject land was not mapped as Key Habitat. The proposal will result in the removal of a small amount of key habitat. Small areas of the fauna corridor will also be impacted.

North-south fauna movement through vegetation to the east of the subject land will be slightly impacted by the proposed access roads. The proposed road in the centre of the study area will create gaps in the canopy potentially between 10-14m wide. The proposed access road in the south of the study area will create canopy gaps potentially up to 14m wide. This gap widens to the west where caretakers residence is proposed to be located.

Proposed replanting of the 50m wide corridor along the northern boundary will strengthen and improve the connection between the east and west sides of the subject land.

An aerial photo showing existing and future movement corridors is shown in Figure 4.5.



Figure 4.4 Significant Tree Survey Map

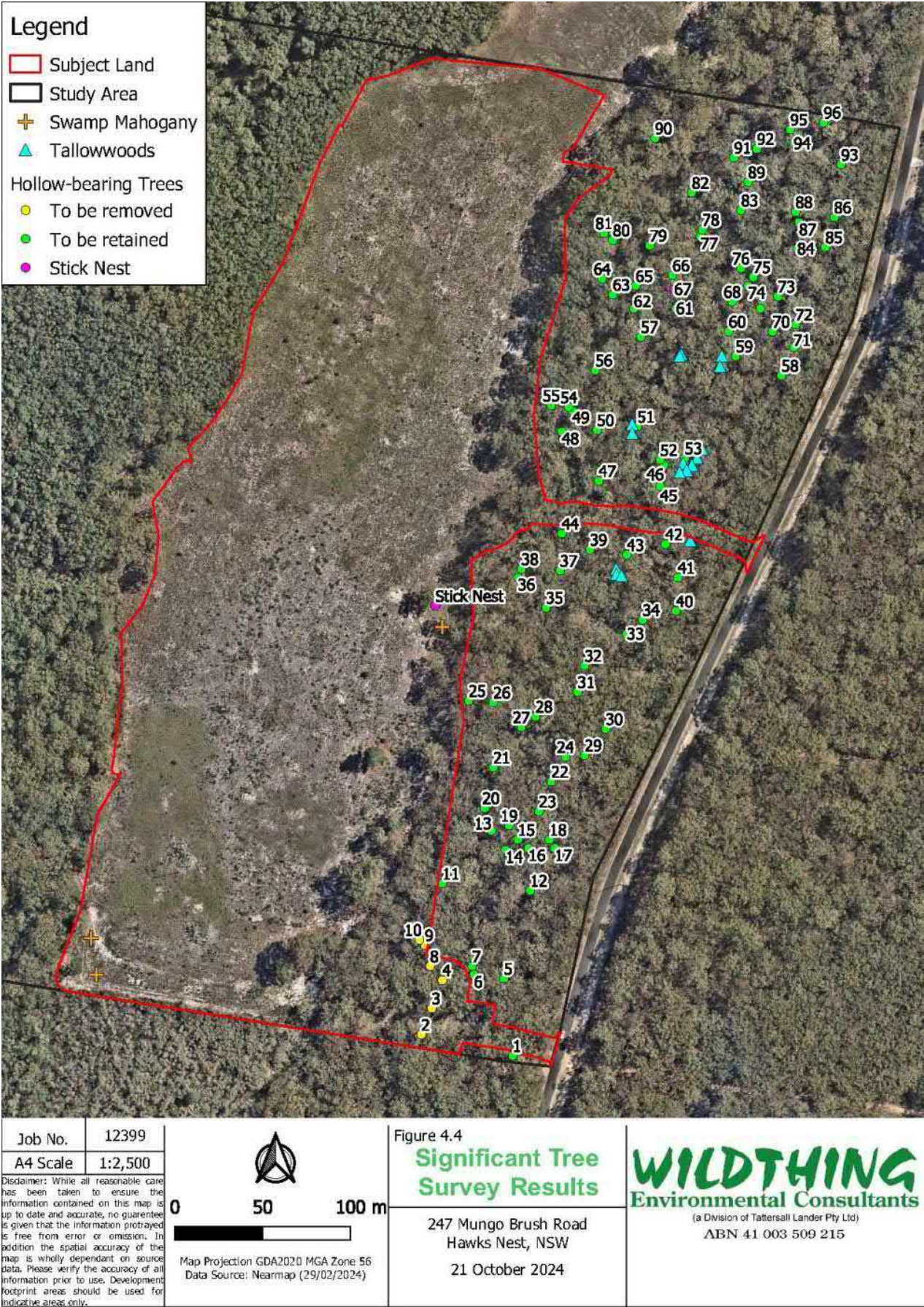
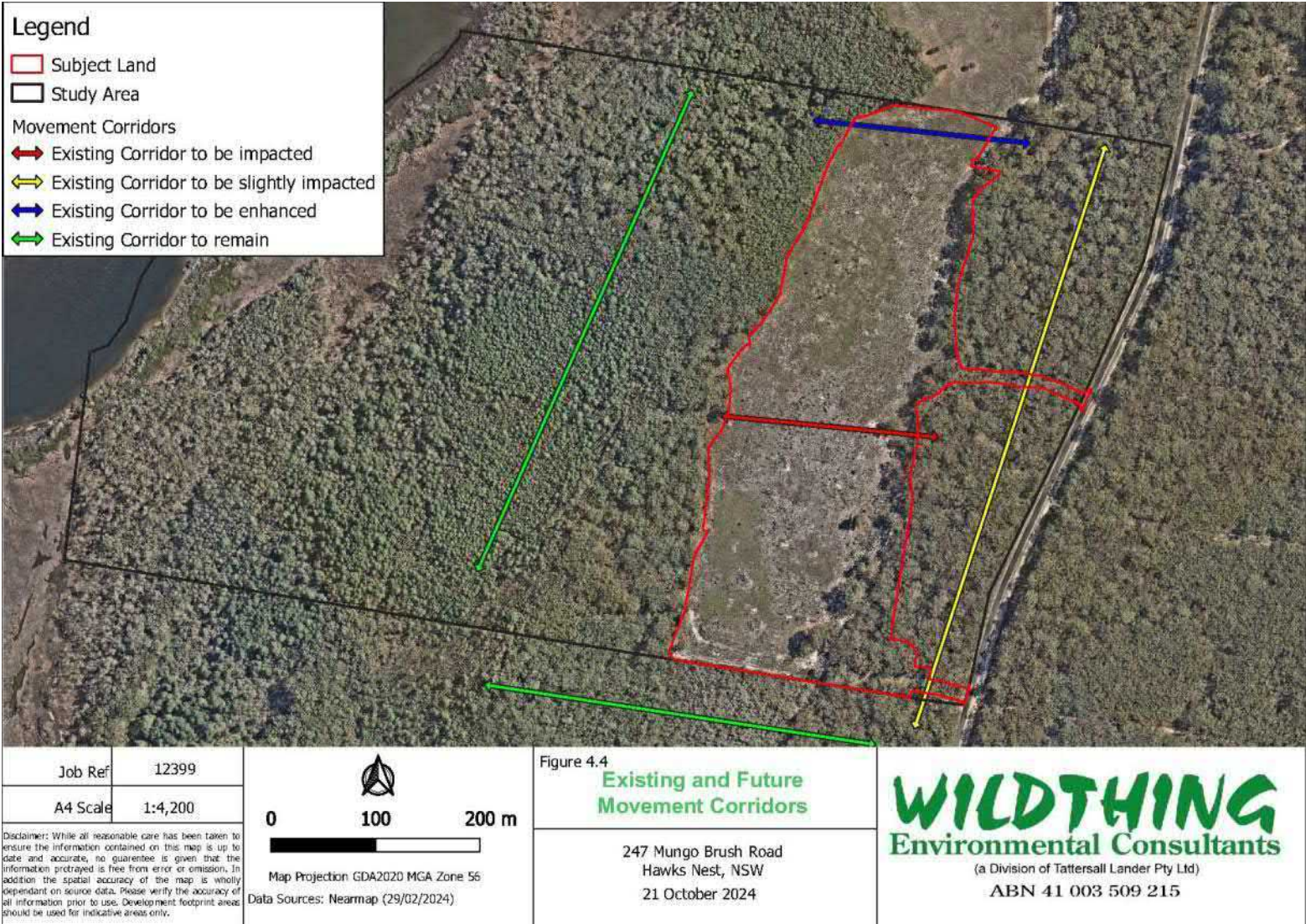




Figure 4.5 Existing and future movement corridors



## 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**

Predicted species *Haliaeetus leucogaster* (White-bellied Sea-Eagle) and *Glossopsitta pusilla* (Little Lorikeet) was observed flying over the study area.

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						
Regent Honeyeater	<i>Anthochaera phrygia</i>	CE	CE	Yes	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Gang-gang Cockatoo (Foraging)	<i>Callocephalon fimbriatum</i>	V	E	Yes	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Glossy Black-Cockatoo	<i>Calyptorhynchus lathami</i>	V	V	Yes	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	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						
Speckled Warbler	<i>Chthonicola sagittata</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Spotted Harrier	<i>Circus assimilis</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	V	V	No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Varied Sittella	<i>Daphoenositta chrysoptera</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	No	BAM-C BioNet Atlas	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Black-necked Stork	<i>Ephippiorhynchus asiaticus</i>	E		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	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						
Beach Stone-curlew (Foraging)	<i>Esacus magnirostris</i>	CE		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	V		No	BAM-C Recorded on site	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Little Lorikeet	<i>Glossopsitta pusilla</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
White-bellied Sea-Eagle (foraging)	<i>Haliaeetus leucogaster</i>	V		No	BAM-C BioNet Atlas Recorded on site	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Little Eagle (Foraging)	<i>Hieraaetus morphnoides</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
White-throated Needletail	<i>Hirundapus caudacutus</i>		V	No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	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						
Swift Parrot	<i>Lathamus discolor</i>	E	CE	Yes	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Square-tailed Kite (Foraging)	<i>Lophoictinia isura</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	V		No	BAM-C BioNet Atlas	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Little Bent-winged-bat (Foraging)	<i>Miniopterus australis</i>	V		No	BAM-C BioNet Atlas Recorded on site	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Large Bent-winged-bat (Foraging)	<i>Miniopterus orianae oceanensis</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	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						
Turquoise Parrot	<i>Neophema pulchella</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Eastern Osprey (Foraging)	<i>Pandion cristatus</i>	V		No	BAM-C BioNet Atlas	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Yellow-bellied Glider	<i>Petaurus australis</i>	V	V	No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Golden-tipped Bat	<i>Phoniscus papuensis</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
New Holland Mouse	<i>Pseudomys novaehollandiae</i>		V	No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	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						
Grey-headed Flying-fox (foraging)	<i>Pteropus poliocephalus</i>	V	V	Yes	BAM-C BioNet Atlas Recorded on site	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Superb Fruit-Dove	<i>Ptilinopus superbus</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High
Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Diamond Firetail	<i>Stagonopleura guttata</i>	V	V	No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	Moderate
Common Blossom-bat	<i>Syconycteris australis</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived	High

## 5.1.2 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				
Nabiac Casuarina	<i>Allocasuarina simulans</i>	V	V	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Charmhaven Apple	<i>Angophora inopina</i>	V	V	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Netted Bottle Brush	<i>Callistemon linearifolius</i>	V		BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Dwarf Kerrawang	<i>Commersonia prostrata</i>	E	E	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Red Helmet Orchid	<i>Corybas dowlingii</i>	E		BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Leafless Tongue Orchid	<i>Cryptostylis hunteriana</i>	V	V	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived



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				
White-flowered Wax Plant	<i>Cynanchum elegans</i>	E	E	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Sand Doubletail	<i>Diuris arenaria</i>	E		BAM-C	No	Not within the Port Stephens LGA	
Rough Doubletail	<i>Diuris praecox</i>	V	V	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Drooping Red Gum	<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	V	V	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	V	V	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Noah's False Chickweed	<i>Lindernia alsinoides</i>	E		BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Villous Mint-bush	<i>Prostanthera densa</i>	V	V	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived

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				
Eastern Australian Underground Orchid	<i>Rhizanthella slateri</i>	V	E	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
<i>Rhizanthella slateri</i> - endangered population	<i>Rhizanthella slateri</i>	E3		BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Native Guava	<i>Rhodomyrtus psidioides</i>	E4A	CE	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Coast Groundsel	<i>Senecio spathulatus</i>	E		BAM-C	No	Greater than 500m from the coast	
Magenta Lilly Pilly	<i>Syzygium paniculatum</i>	E	V	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Black-eyed Susan	<i>Tetradlea juncea</i>	V	V	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived

**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					
Rufous Bettong	<i>Aepyprymnus rufescens</i>	V		No	BAM-C	No	Subject land is not north of Gloucester	
Regent Honeyeater	<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.	
Bush Stone-curlew	<i>Burhinus grallarius</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Gang-gang Cockatoo (Breeding)	<i>Callocephalon fimbriatum</i>	V	E	Yes	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Glossy Black-Cockatoo (breeding)	<i>Calyptrorhynchus lathamii</i>	V		Yes	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived



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					
Wallum Froglet	<i>Crinia tinnula</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Emu population in the NSW North Coast Bioregion and Port Stephens LGA	<i>Dromaius novaehollandiae</i>	E2		No	BAM-C BioNet Atlas	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Beach Stone-curlew (Breeding)	<i>Esacus magnirostris</i>	CE		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
White-bellied Sea-Eagle (breeding)	<i>Haliaeetus leucogaster</i>	V		No	BAM-C BioNet Atlas	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate
Little Eagle (Breeding)	<i>Hieraaetus morphnoides</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate
Stephens' Banded Snake	<i>Hoplocephalus stephensii</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived

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					
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.	
Green & Golden Bell Frog	<i>Litoria aurea</i>	E	V	Yes	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Square-tailed Kite (Breeding)	<i>Lophoictinia isura</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate
Little Bent-winged Bat (breeding)	<i>Miniopterus australis</i>	V		No	BAM-C	No	None of the following were within the subject land: <ul style="list-style-type: none"> <li>• Caves</li> <li>• 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'</li> <li>• observation type code 'E nest-roost'</li> <li>• with numbers of individuals &gt;500</li> <li>• or from the scientific literature</li> </ul>	

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					
Large Bent-winged Bat (breeding)	<i>Miniopterus orianae oceanensis</i>	V		No	BAM-C	No	None of the following were within the subject land: <ul style="list-style-type: none"> <li>• Caves</li> <li>• 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'</li> <li>• observation type code 'E nest-roost'</li> <li>• with numbers of individuals &gt;500</li> </ul> or from the scientific literature	
Southern Myotis	<i>Myotis macropus</i>	V		No	BAM-C	No	No Waterbodies and no Waterbodies with permanent pools/stretches 3m or wider, including rivers, large creeks, billabongs, lagoons, estuaries, dams and other waterbodies, on or within 200m of the site	
Barking Owl (Breeding)	<i>Ninox connivens</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - 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
		BC Act	EPBC Act					
Powerful Owl (Breeding)	<i>Ninox strenua</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good
Eastern Osprey (breeding)	<i>Pandion cristatus</i>	V		No	BAM-C BioNet Atlas	Yes	• N/A	PCT 3544- Good PCT 3544 - Moderate
Southern Greater Glider	<i>Petauroides volans</i>	E	E	No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate
Squirrel Glider	<i>Petaurus norfolcensis</i>	V		No	BAM-C BioNet Atlas Recorded on site	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate
Brush-tailed Rock-wallaby	<i>Petrogale penicillata</i>	E	V	Yes	BAM-C	No	Land not within 1 km of rocky escarpments, gorges, steep slopes, boulder piles, rock outcrops or clifflines	
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - 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
		BC Act	EPBC Act					
Koala (breeding)	<i>Phascolarctos cinereus</i>	E	E	Yes	BAM-C BioNet Atlas Recorded on site	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate
Common Planigale	<i>Planigale maculata</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived
Long-nosed Potoroo	<i>Potorous tridactylus</i>	V	V	Yes	BAM-C BioNet Atlas	Yes	N/A	PCT 3544- Good
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	V	Yes	BAM-C BioNet Atlas Recorded on site	No	None of the following were present within the subject land: • Breeding Camps	N/A
Masked Owl (breeding)	<i>Tyto novaehollandiae</i>	V		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate
Mahony's Toadlet	<i>Uperoleia mahonyi</i>	E		No	BAM-C	Yes	N/A	PCT 3544- Good PCT 3544 - Moderate PCT 3544 - Derived

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					
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	V		No	BAM-C	No	No Caves present No 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."	



## 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			
Nabiac Casuarina	<i>Allocasuarina simulans</i>	V	V	Targeted threatened species survey	No	No
Charmhaven Apple	<i>Angophora inopina</i>	V	V	Targeted threatened species survey	No	No
Netted Bottle Brush	<i>Callistemon linearifolius</i>	V		Targeted threatened species survey	No	No
Dwarf Kerrawang	<i>Commersonia prostrata</i>	E	E	Targeted threatened species survey	No	No
Red Helmet Orchid	<i>Corybas dowlingii</i>	E		Targeted threatened species survey	No	No
Leafless Tongue Orchid	<i>Cryptostylis hunteriana</i>	V	V	Targeted threatened species survey	No	No
White-flowered Wax Plant	<i>Cynanchum elegans</i>	E	E	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			
Rough Doubletail	<i>Diuris praecox</i>	V	V	Targeted threatened species survey	No	No
Drooping Red Gum	<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	V	V	Targeted threatened species survey	No	No
Small-flower Grevillea	<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	V	V	Targeted threatened species survey	No	No
Noah's False Chickweed	<i>Lindernia alsinoides</i>	E		Targeted threatened species survey	No	No
Villous Mint-bush	<i>Prostanthera densa</i>	V	V	Targeted threatened species survey	No	No
Eastern Australian Underground Orchid	<i>Rhizanthella slateri</i>	V	E	Targeted threatened species survey	No	No
<i>Rhizanthella slateri</i> - endangered population	<i>Rhizanthella slateri</i>	E3		Targeted threatened species survey	No	No
Native Guava	<i>Rhodomyrtus psidioides</i>	E4A	CE	Targeted threatened species survey	No	No
Magenta Lilly Pilly	<i>Syzygium paniculatum</i>	E	V	Targeted threatened species survey	No	No
Black-eyed Susan	<i>Tetradlea juncea</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	Present?	Further assessment
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		BC Act	EPBC Act	presence		required? (BAM Subsections 5.2.5 and 5.2.6)
Beach Stone-curlew	<i>Esacus magnirostris</i>		CE	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 survey	No	No
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	V		Targeted threatened species survey	No	No
Little Eagle	<i>Hieraaetus morphnoides</i>	V		Targeted threatened species survey	No	No
Swift Parrot	<i>Lathamus discolor</i>			Within important habitat mapped area	No	Yes
Green and 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	No	No
Barking Owl (Breeding)	<i>Ninox connivens</i>	V		Targeted threatened species survey	No	No
Powerful Owl (Breeding)	<i>Ninox strenua</i>	V		Targeted threatened species	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			
				survey		
Eastern Osprey (breeding)	<i>Pandion cristatus</i>	V		Targeted threatened species survey	No	No
Squirrel Glider	<i>Petaurus norfolcensis</i>	V		Targeted threatened species survey	Yes	Yes
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	Yes	Yes
Common Planigale	<i>Planigale maculata</i>	V		Targeted threatened species survey	No	No
Long-nosed Potoroo	<i>Potorous tridactylus</i>	V	V	Targeted threatened species survey	Yes	Yes
Masked Owl (breeding)	<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)		
Nabiac Casuarina	<i>Allocasuarina simulans</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -13 June 2019	<input type="checkbox"/> No	4.0hr (1 person)	No
Charmhaven Apple	<i>Angophora inopina</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -13 June 2019	<input type="checkbox"/> No	4.0hr (1 person)	No
Netted Bottlebrush	<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 -2 October 2019	<input type="checkbox"/> No	6.0hr (2 persons)	No
Dwarf Kerrawang	<i>Commersonia prostrata</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -12 September 2019 -15 July 2024 -19 July 2024 - 30 July 2024	<input checked="" type="checkbox"/> No	3.0hr (2 persons) 4.5hr (1 person) 16.5hr (3 persons) 13.5 (3 persons)	No
Red Helmet Orchid	<i>Corybas dowlingii</i>	Systematic parallel transects Known flowering site used at Soldiers Point  Methods described in NSW survey guide for the Biodiversity Assessment Method	<input checked="" type="checkbox"/> Yes -15 July 2024 -19 July 2024 - 30 July 2024	<input type="checkbox"/> No	4.5hr (1 person) 16.5hr (3 persons) 13.5 (3 persons)	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)		
		(DPIE 2020e)				
Leafless Tongue Orchid	<i>Cryptostylis hunteriana</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -28 November 2019	<input type="checkbox"/> No 3.0hr (1 person)	No	No
White-flowered Wax Plant	<i>Cynanchum elegans</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -2 October 2019	<input type="checkbox"/> No 6.0hr (2 persons)	No	No
Rough Doubletail	<i>Diuris praecox</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -16 August 2019	<input type="checkbox"/> No 5.0hr (3 persons)	No	No
Drooping Redgum	<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -02/10/2019 (Koala food tree search) -28/11/2019 (Koala food tree search) -13 June 2019	<input type="checkbox"/> No 1.0hr (1 person) 1.0hr (1 person) 4.0hr (1 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 -2 October 2019	<input type="checkbox"/> No 6.0hr (2 persons)	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)
Noah's False Chickweed	<i>Lindernia alsinoides</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -28 November 2019	<input type="checkbox"/> No	3.0hr (1 person)	No	No
Villous Mint-bush	<i>Prostanthera densa</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -2 October 2019	<input type="checkbox"/> No	6.0hr (2 persons)	No	No
Eastern Australian Underground Orchid	<i>Rhizanthella slateri</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -12 September 2019	<input checked="" type="checkbox"/> No	3.0hr (2 persons)	No	No
Eastern Australian Underground Orchid endangered population	<i>Rhizanthella slateri</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -12 September 2019	<input checked="" type="checkbox"/> No	3.0hr (2 persons)	No	No
Native Guava	<i>Rhodomyrtus psidioides</i>	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -2 October 2019	<input type="checkbox"/> No	6.0hr (2 persons)	No	No
Magenta Lilly Pilly	<i>Syzygium paniculatum</i>	Systematic parallel transects	<input checked="" type="checkbox"/> Yes -13 June 2019	<input type="checkbox"/> No	4.0hr (1 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)		
		Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)					
Black-eyed Susan	Tetradlea juncea	Systematic parallel transects  Methods described in NSW survey guide for the Biodiversity Assessment Method (DPIE 2020e)	<input checked="" type="checkbox"/> Yes -12 September 2019	<input checked="" type="checkbox"/> No	3.0hr (2 persons)	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	<input checked="" type="checkbox"/> Yes <u>Spotlight Survey</u>		<input type="checkbox"/> No	<u>Spotlighting</u>	No	No
		Camera Trapping	24/06/2024			1.0hr (1 person)		
			19/06/2024			1.0hr (1 person)		
		Survey Time: All Year	01/06/2021			1.0hr (1 person)		
			11/02/2021			1.5hr (1 person)		
		As described in Threatened biodiversity survey and assessment Guidelines for developments and activities (2004 working draft) (DEC 2004)	08/02/2021			1.5hr (1 person)		
			16/10/2019			0.5hr (1 person)		
			06/08/2019			0.5hr (1 person)		
			15/05/2019			1.5hr (1 person)		

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>Call Playback</u> 01/06/2021 18/05/2021 16/10/2019 06/08/2019 15/05/2019  <u>Camera traps</u> 15/05/2019 – 13/06/2019 13/06/2019 – 06/08/2019 16/08/2019 – 05/09/2019 06/08/2019 – 16/08/2019 05/09/2019 – 12/09/2019 03/07/2024 – 30/07/2024 03/07/2024 – 30/07/2024			
Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	Avifauna Survey  Survey Time: October – January  Methods as outlined in TBDC (NSW DCCEEW 2024e)	<input checked="" type="checkbox"/> Yes <u>Avifauna survey</u> 17/10/2019 16/10/2019 15/10/2019	<u>Avifauna</u> 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person)		
South-eastern Glossy Black-Cockatoo	<i>Calyptrorhynchus lathamii</i>	Avifauna Survey  Survey Time: January - September	<input checked="" type="checkbox"/> Yes <u>Avifauna survey</u> 18/05/2021 05/09/2019	<u>Avifauna</u> 0.5hr (1 person) 0.5hr (1 person)		



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)		
		Methods as outlined in TBDC (NSW DCCEEW 2024e)	06/08/2019 13/06/2019 16/05/2019 15/05/2019		0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person)		
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Spotlighting  Small Mammal Trapping Elliott A Ground Trapping (30 traps over four nights=120 trap nights) Elliott B Arboreal Trapping (2 traps over 4 nights=8 trap nights) PVC Pipe Arboreal Trapping (5 traps over 4 nights = 20 trap nights)  Camera Trapping  Survey Time: October - March  Methods as outlined in Survey guidelines for Australia’s threatened mammals (DSEWPac 2011)	<input checked="" type="checkbox"/> Yes <u>Spotlight Survey</u> 11/02/2021 08/02/2021 16/10/2019 15/05/2019  <u>Camera traps</u> 16/05/2019 – 13/06/2019 13/06/2019 – 06/08/2019 05/09/2019 – 12/09/2019 14/06/2024 – 30/07/20124 19/06/2024 – 30/07/2024 19/06/2024 – 24/06/2024 24/06/2024 - 30/07/2024 03/07/2024 – 30/07/2024 15/07/2024 – 30/07/2024 15/07/2024 – 30/07/2024 <u>Trapping</u> 14/10/2019 - 18/10/2019  <u>Pitfall Trap</u> 14/10/2019 - 18/10/2019	<input type="checkbox"/> No	<u>Spotlighting</u> 1.5hr (1 person) 1.5hr (1 person) 0.5hr (1 person) 1.5hr (1 person)	No	No

Biodiversity Development Assessment Report

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)
			16/08/2019 – 05/09/2019 06/08/2019 – 16/08/2019 05/09/2019 – 12/09/2019 03/07/2024 – 30/07/2024 03/07/2024 – 30/07/2024				
Beach Stone-curlew	<i>Esacus magnirostris</i>	Avifauna Survey  Terrestrial Camera Trapping  Survey Time: All Year  Methods as outlined in TBDC (NSW DCCEEW 2024e)	<input checked="" type="checkbox"/> Yes <u>Avifauna survey</u> 18/05/2021 17/10/2019 16/10/2019 15/10/2019 05/09/2019 06/08/2019 13/06/2019 16/05/2019 15/05/2019  <u>Camera traps</u> 15/05/2019 – 13/06/2019 13/06/2019 – 06/08/2019 16/08/2019 – 05/09/2019 06/08/2019 – 16/08/2019 05/09/2019 – 12/09/2019 03/07/2024 – 30/07/2024	<input type="checkbox"/> No	<u>Avifauna</u> 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person)	No	No
White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	Significant Tree Survey for large stick nests	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No		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)
		Survey Time: July - December  Methods as outlined in TBDC (NSW DCCEEW 2024e)	<u>Avifauna survey</u> 17/10/2019 16/10/2019 15/10/2019 05/09/2019 06/08/2019  <u>Habitat Tree Survey</u> -28/11/2019		<u>Avifauna</u> 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person)  <u>Habitat Tree Survey</u> 2.0hr (1 person)	Observed but no large stick nests found	
Little Eagle	<i>Hieraaetus morphnoides</i>	Significant Tree Survey for large stick nests  Survey Time: August - October  Methods as outlined in TBDC (NSW DCCEEW 2024e)	<input checked="" type="checkbox"/> Yes <u>Avifauna survey</u> 17/10/2019 16/10/2019 15/10/2019 05/09/2019 06/08/2019  <u>Habitat Tree Survey</u> -28/11/2019	<input type="checkbox"/> No	<u>Avifauna</u> 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person)  <u>Habitat Tree Survey</u> 2.0hr (1 person)	No	No
Stephens' Banded Snake	Hoplocephalus stephensii	Spotlighting  Survey Time: October – March  Methods as outlined in TBDC (NSW	<input checked="" type="checkbox"/> Yes <u>Spotlight Survey</u> 11/02/2021 08/02/2021 16/10/2019	<input type="checkbox"/> No	Spotlighting 1.5hr (1 person) 1.5hr (1 person) 0.5hr (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)		
		DCCEEW 2024e)	15/05/2019  <u>Pitfall Trap</u> 14/10/2019 - 18/10/2019		01.5hr (1 person)		
Green and Golden Bell Frog	<i>Litoria aurea</i>	Nocturnal/Diurnal Aural-visual surveys Call Playback  Survey Time: November - March  Methods described in NSW Survey Guide for Threatened Frogs (DPIE 2020d)	<input checked="" type="checkbox"/> Yes <u>Amphibian survey</u> 31/03/2021 11/02/2021 08/02/2021	<input type="checkbox"/> No	<u>Amphibian</u> 1.0hr (1 person) 1.5hr (1 person) 1.5hr (1 person)	No	No
Square-tailed Kite	<i>Lophoictinia isura</i>	Significant Tree Survey for large stick nests  Survey Time: September - January  Methods as outlined in TBDC (NSW DCCEEW 2024e)	<input checked="" type="checkbox"/> Yes <u>Avifauna survey</u> 17/10/2019 16/10/2019 15/10/2019 05/09/2019  <u>Habitat Tree Survey</u> -28/11/2019	<input type="checkbox"/> No	<u>Avifauna</u> 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person)  <u>Habitat Tree Survey</u> 2.0hr (1 person)	No	No
Barking Owl	<i>Ninox connivens</i>	Listening for calls on dusk  Call-playback	<input checked="" type="checkbox"/> Yes <u>Listening for calls</u> 30/07/2024 24/06/2024	<input type="checkbox"/> No	<u>Listening for calls</u> 1.0hr (1 person) 1.0hr (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)		
		Spotlighting  Survey Time: January - August  Methods as outlined in TBDC (NSW DCCEEW 2024e)	19/06/2024 01/06/2021 18/05/2021  <u>Call Playback</u> 24/06/2024 19/06/2024 01/06/2021 18/05/2021 06/08/2019 15/05/2019  <u>Spotlight Survey</u> 24/06/2024 19/06/2024 01/06/2021 11/02/2021 08/02/2021 06/08/2019 15/05/2019		0.75hr (1 person) 1.0hr (1 person) 0.75hr (1 person)  <u>Call Playback</u> 1.0hr (1 person) 0.5hr (1 person) 1.0hr (1 person) 0.75hr (1 person) 0.5hr (1 person) 0.5hr (1 person)  <u>Spotlighting</u> 1.0hr (1 person) 1.0hr (1 person) 1.0hr (1 person) 1.5hr (1 person) 1.5hr (1 person) 0.5hr (1 person) 1.5hr (1 person)		
Powerful Owl	<i>Ninox strenua</i>	Listening for calls on dusk  Call-playback  Spotlighting	<input checked="" type="checkbox"/> Yes <u>Listening for calls</u> 30/07/2024 24/06/2024 19/06/2024	<input type="checkbox"/> No	<u>Listening for calls</u> 1.0hr (1 person) 1.0hr (1 person) 0.75hr (1 person)	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)
		Survey Time: January - August  Methods as outlined in TBDC (NSW DCCEEW 2024e)	01/06/2021 18/05/2021  <u>Call Playback</u> 24/06/2024 19/06/2024 01/06/2021 18/05/2021 06/08/2019 15/05/2019  <u>Spotlight Survey</u> 24/06/2024 19/06/2024 01/06/2021 11/02/2021 08/02/2021 06/08/2019 15/05/2019		1.0hr (1 person) 0.75hr (1 person)  <u>Call Playback</u> 1.0hr (1 person) 0.5hr (1 person) 1.0hr (1 person) 0.75hr (1 person) 0.5hr (1 person) 0.5hr (1 person)  <u>Spotlighting</u> 1.0hr (1 person) 1.0hr (1 person) 1.0hr (1 person) 1.5hr (1 person) 1.5hr (1 person) 0.5hr (1 person) 1.5hr (1 person)		
Eastern Osprey	<i>Pandion cristatus</i>	Significant Tree Survey for large stick nests  Survey Time: August - October  Methods as outlined in TBDC (NSW DCCEEW 2024e)	<input checked="" type="checkbox"/> Yes <u>Avifauna survey</u> 17/10/2019 16/10/2019 15/10/2019 05/09/2019	<input type="checkbox"/> No	<u>Avifauna</u> 0.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 0.5hr (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)			
			06/08/2019		0.5hr (1 person)	
			<u>Habitat Tree Survey</u> -28/11/2019		<u>Habitat Tree Survey</u> 2.0hr (1 person)	
Southern Greater Glider	<i>Petauroides volans</i>	Spotlighting  Arboreal Mammal Trapping Elliott B Arboreal Trapping (2 traps over 4 nights=8 trap nights) PVC Pipe Arboreal Trapping (5 traps over 4 nights = 20 trap nights)  Camera Trapping  Survey Time: All Year  Methods as outlined in Survey guidelines for Australia’s threatened mammals (DSEWPaC 2011)	<input checked="" type="checkbox"/> Yes <u>Spotlight Survey</u> 24/06/2024 19/06/2024 01/06/2021 11/02/2021 08/02/2021 16/10/2019 06/08/2019 15/05/2019  <u>Stag Watch</u> -5/05/2019  <u>Trapping</u> 14/10/2019 -18/10/2019  <u>Camera traps</u> 16/05/2019 – 13/06/2019 13/06/2019 – 06/08/2019 05/09/2019 – 12/09/2019	<input type="checkbox"/> No	<u>Spotlighting</u> 1.0hr (1 person) 1.0hr (1 person) 1.0hr (1 person) 1.5hr (1 person) 1.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 1.5hr (1 person)	No

Biodiversity Development Assessment Report



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)
			16/05/2019 – 13/06/2019 13/06/2019 – 06/08/2019 05/09/2019 – 12/09/2019 14/06/2024 – 30/07/20124 19/06/2024 – 30/07/2024 19/06/2024 – 24/06/2024 24/06/2024 - 30/07/2024 03/07/2024 – 30/07/2024 15/07/2024 – 30/07/2024 15/07/2024 – 30/07/2024				
Brush-tailed Phascogale	<i>Phascogale tapoatafa</i>	Spotlighting  Small Mammal Trapping Elliott B Arboreal Trapping (10 traps over 4 nights=40 trap nights) Camera Trapping Elliott A Ground Trapping (50 traps over four nights=200 trap nights) PVC Pipe Arboreal Trapping (5 traps over 4 nights = 20 trap nights)  Camera Trapping  Survey Time: December - June  Methods outlined in TBDC (2022) and Survey guidelines for Australia’s	<input checked="" type="checkbox"/> Yes <u>Spotlight Survey</u> 24/06/2024 19/06/2024 01/06/2021 11/02/2021 08/02/2021 15/05/2019  <u>Stag Watch</u> -5/05/2019  <u>Camera traps</u> 16/05/2019 – 13/06/2019 13/06/2019 – 06/08/2019 14/06/2024 – 30/07/20124	<input type="checkbox"/> No <u>Trapping</u> 14/10/2019 - 18/10/2019	<u>Spotlighting</u> 1.0hr (1 person) 1.0hr (1 person) 1.0hr (1 person) 1.5hr (1 person) 1.5hr (1 person) 1.5hr (1 person)	No	No

Biodiversity Development Assessment Report

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)		
			24/06/2024 - 30/07/2024 03/07/2024 – 30/07/2024 15/07/2024 – 30/07/2024 15/07/2024 – 30/07/2024  <u>Spot Assessment Technique</u> 08/02/2021 11/02/2021			
Common Planigale	<i>Planigale maculata</i>	Small Mammal Trapping Elliott B Arboreal Trapping (10 traps over 4 nights=40 trap nights) Camera Trapping Elliott A Ground Trapping (50 traps over four nights=200 trap nights) PVC Pipe Arboreal Trapping (5 traps over 4 nights = 20 trap nights)  Camera Trapping  Survey Time: All Year  Methods as outlined in TBDC (NSW DCCEE 2024e) and Survey guidelines for Australia's threatened mammals (DSEWPac 2011)	<input checked="" type="checkbox"/> Yes <u>Spotlight Survey</u> 24/06/2024 19/06/2024 01/06/2021 11/02/2021 08/02/2021 16/10/2019 06/08/2019 15/05/2019  <u>Trapping</u> 14/10/2019 - 18/10/2019  <u>Camera traps</u> 16/05/2019 – 13/06/2019 13/06/2019 – 06/08/2019	<input type="checkbox"/> No  <u>Spotlighting</u> 1.0hr (1 person) 1.0hr (1 person) 1.0hr (1 person) 1.5hr (1 person) 1.5hr (1 person) 0.5hr (1 person) 0.5hr (1 person) 1.5hr (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)		
			05/09/2019 – 12/09/2019 14/06/2024 – 30/07/20124 19/06/2024 – 30/07/2024 19/06/2024 – 24/06/2024 24/06/2024 - 30/07/2024 03/07/2024 – 30/07/2024 15/07/2024 – 30/07/2024			
Long-nosed Potoroo	<i>Potorous tridactylus</i>	Cage Trapping (2 cages over 4 nights = 8 trap nights)  Camera Trapping  Survey Time: All Year  Methods as outlined in TBDC (NSW DCCEE 2024e) and Survey guidelines for Australia's threatened mammals (DSEWPac 2011)	<input checked="" type="checkbox"/> Yes <u>Trapping</u> 14/10/2019 - 18/10/2019  <u>Camera traps</u> 15/05/2019 – 13/06/2019 13/06/2019 – 06/08/2019 16/08/2019 – 05/09/2019 06/08/2019 – 16/08/2019 05/09/2019 – 12/09/2019 03/07/2024 – 30/07/2024	<input type="checkbox"/> No	Yes	Yes
Masked Owl	<i>Tyto novaehollandiae</i>	Listening for calls on dusk  Call-playback  Spotlighting  Survey Time: January - August	<input checked="" type="checkbox"/> Yes <u>Listening for calls</u> 30/07/2024 24/06/2024 19/06/2024 01/06/2021 18/05/2021	<input type="checkbox"/> No  <u>Listening for calls</u> 1.0hr (1 person) 1.0hr (1 person) 0.75hr (1 person) 1.0hr (1 person) 0.75hr (1 person)		

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)
		Methods as outlined in TBDC (NSW DCCEEW 2024e)	<u>Call Playback</u> 24/06/2024 19/06/2024 01/06/2021 18/05/2021 06/08/2019 15/05/2019  <u>Spotlight Survey</u> 24/06/2024 19/06/2024 01/06/2021 11/02/2021 08/02/2021 06/08/2019 15/05/2019		<u>Call Playback</u> 1.0hr (1 person) 0.5hr (1 person) 1.0hr (1 person) 0.75hr (1 person) 0.5hr (1 person) 0.5hr (1 person)  <u>Spotlighting</u> 1.0hr (1 person) 1.0hr (1 person) 1.0hr (1 person) 1.5hr (1 person) 1.5hr (1 person) 0.5hr (1 person) 1.5hr (1 person)		
Mahony's Toadlet	<i>Uperoleia mahonyi</i>	Nocturnal/Diurnal Aural-visual surveys Call Playback  Pitfall Trapping  Survey Time: October - March  Methods described in NSW Survey Guide for Threatened Frogs (DPIE	<input checked="" type="checkbox"/> Yes <u>Amphibian survey</u> 31/03/2021 11/02/2021 08/02/2021 16/10/2019  <u>Pitfall Trap</u> 14/10/2019 -	<input type="checkbox"/> No	<u>Amphibian</u> 1.0hr (1 person) 1.5hr (1 person) 1.5hr (1 person) 2.5hr (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)		
		2020d)	18/10/2019			



## 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)

*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 3544 Good and PCT 3544 Moderate) and accounts for a total area of 1.60ha. Species polygon for Squirrel Glider is shown in 5.1.

No evidence of Koala Activity was recorded within the site during fieldwork which included spotlighting and Koala Spot Assessments. Previous assessment by Eco Logical detected koala through acoustic recording (Eco Logical Australia 2023). Studies completed for the Draft Koala Plan of Management for North Hawks Nest (KPoM) (Biolink, 2005) have mapped the area containing *E. microcorys* as High and Medium Use Core Koala Habitat. This area of Core Koala Habitat also extended further east over Mungo Brush Road where specimens of *E. microcorys* were also present. According to the Draft KPoM areas containing Tallowwood even if under 15% of tree species present would be regarded as Potential Koala Habitat. As Koalas were recorded within this area during studies conducted in 2004 areas containing Tallowwood would be considered to constitute Core Koala Habitat. Given the presence of the Koala within the study area, the species polygon has been based on identified foraging habitat present. Foraging habitat therefore includes all of vegetation zones 1 and 2 (PCT 3544 Good and PCT 3544 Moderate), therefore, a Koala Polygon of 1.60ha was drawn. Figure 5.2 shows the Koala species credit species polygon.

*Ninox strenua* (Powerful Owl) was heard calling during owl surveys will require offsetting. As outlined in the TBDC (NSW DCCEE 2024e):

*The species polygon must be drawn to include all vegetation zones;*

1. within 800 m (being the approximate home range) from the location of a detected owl, and
2. containing a living or dead tree with a hollow >20cm diameter that occurs >4m above the ground.

All areas of the subject land are within 800m of each other therefore all vegetation zones were considered. While no vegetation within the impact area contained large enough hollows, adjacent vegetation that is consistent with vegetation zone PCT 3544 Good contained suitable hollows as described above. Areas of PCT 3544 Good within the subject land were therefore considered for the

species polygon and accounts for a total area of 1.06ha. Species polygon for Powerful Owl is shown in 5.3.

*Potorous tridactylus* (Long-nosed Potoroo) was found to occur on site and will require offsetting. Species Polygon will include all areas of vegetation zones that meet the habitat constraint: *Dense shrub layer or alternatively high canopy cover exceeding 70% (i.e. to capture populations inhabiting wet sclerophyll and rainforest)* (PCT 3544 Good) and accounts for a total area of 1.06ha. Species polygon for Long-nosed Potoroo is shown in 5.4.

Figure 5.1 *Petaurus norfolcensis* (Squirrel Glider) Species Polygon

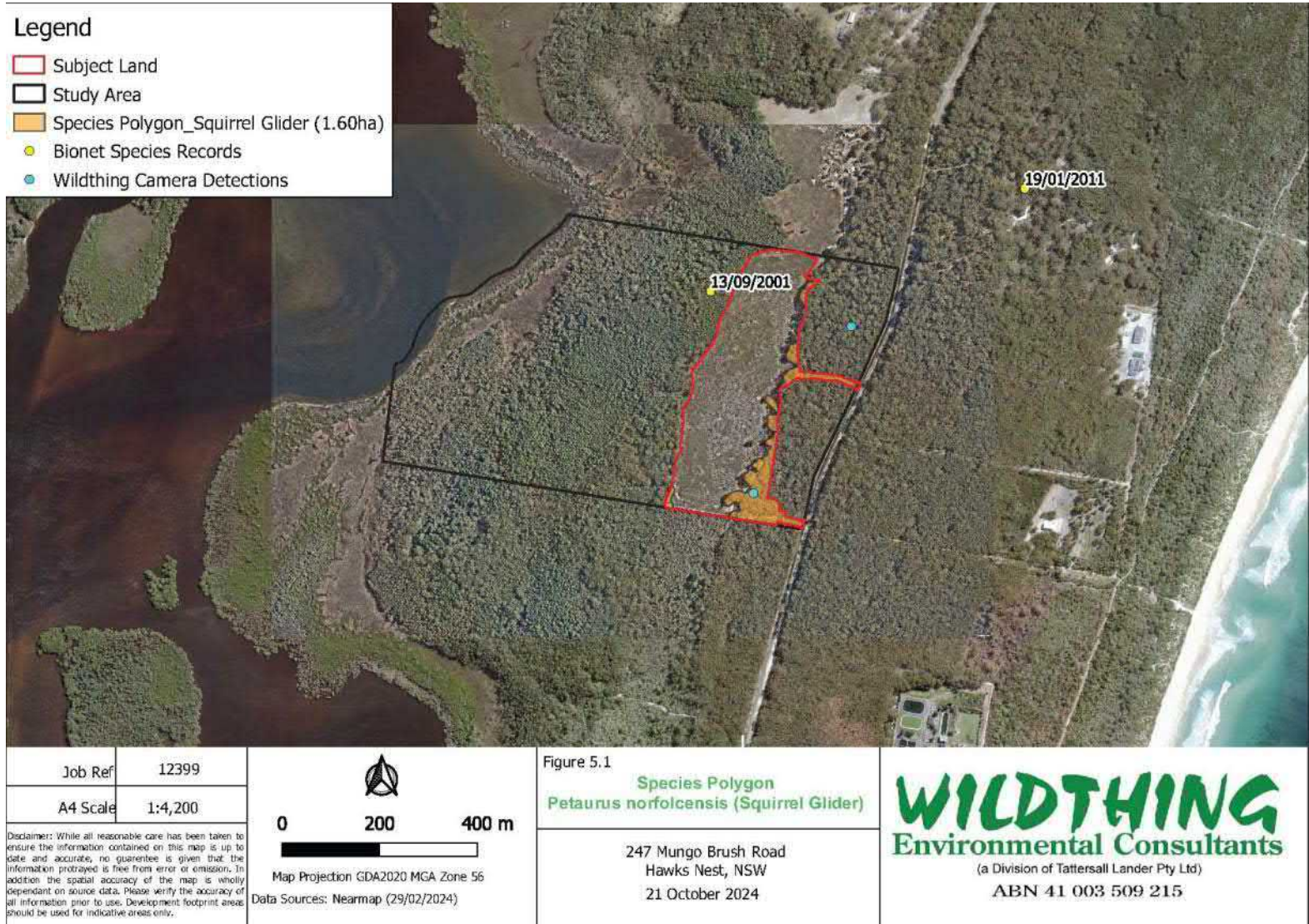




Figure 5.2 *Phascolarctos cinereus* (Koala) Species Polygon





Figure 5.3 *Ninox strenua* (Powerful Owl) Species Polygon

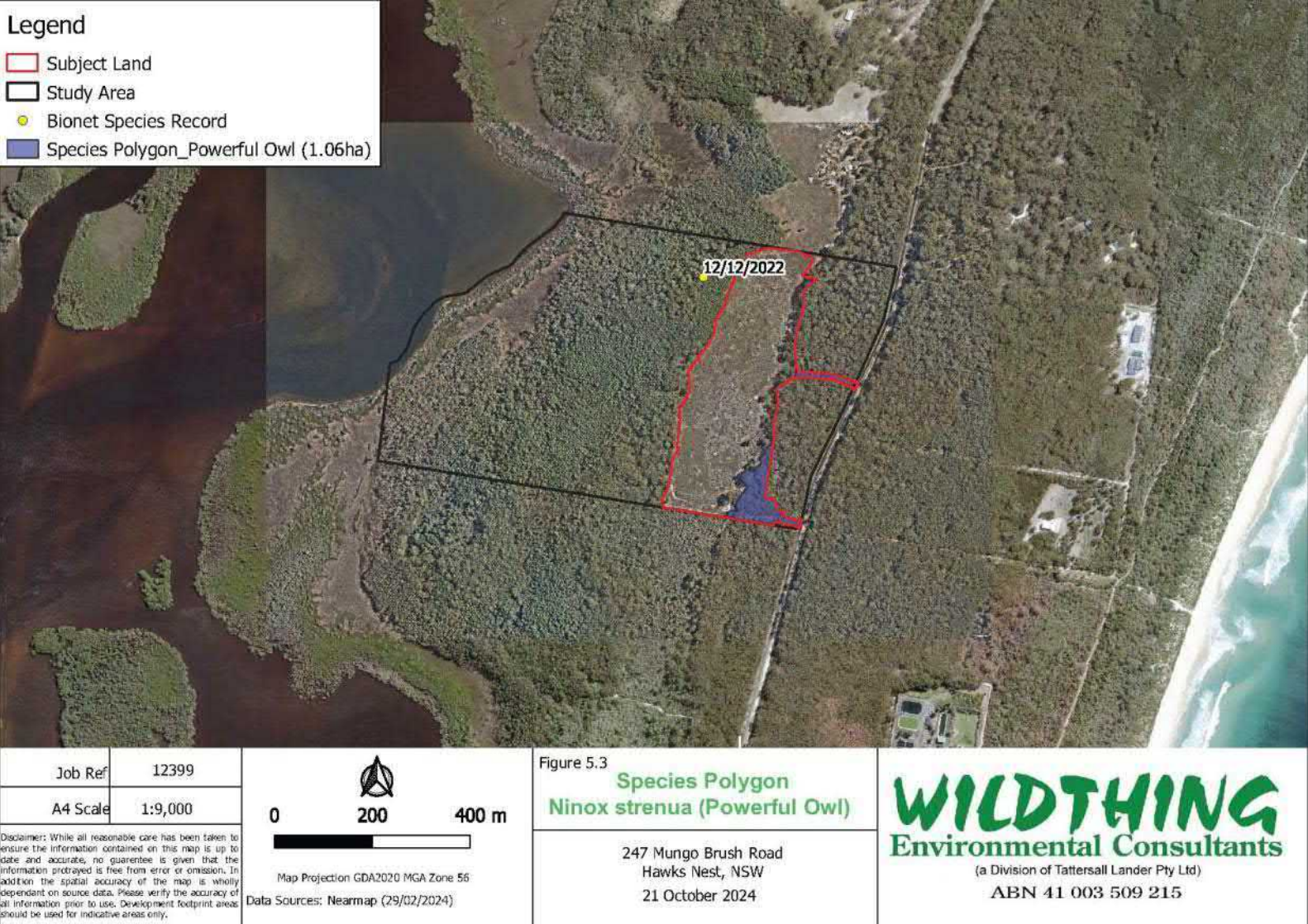
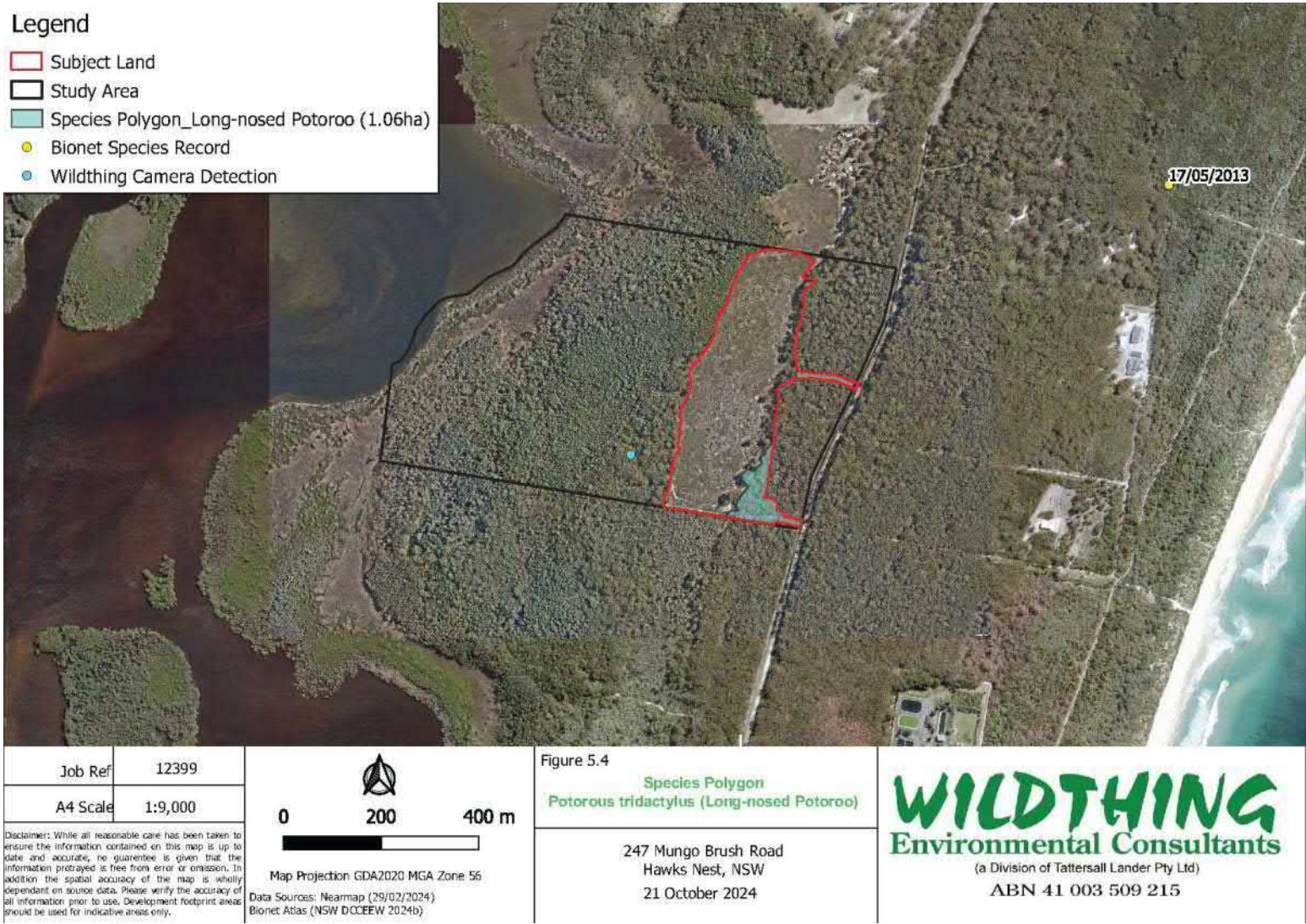




Figure 5.4 *Potorous tridactylus* (Long-nosed Potoroo) Species Polygon





## 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 type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	No human-made structures are present within the subject land.	N/A
Non-native vegetation	<input type="checkbox"/> Yes / <input checked="" type="checkbox"/> No	No non-native vegetation was present within the subject land.	N/A
Habitat connectivity	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	The entire eastern portion of the study area including the subject land was mapped as a regional corridor in NE NSW (NPWS 2003) (Figure 3.1). A large portion of the study area was also mapped as key habitat (NPWS 2003).	Squirrel Glider and the Koala
Waterbodies, water quality and hydrological processes	<input checked="" type="checkbox"/> Yes / <input type="checkbox"/> No	No prescribed streams were located within the subject land. Groundwater Dependent Ecosystems (GDE's) are ecosystems that are fully or partially dependent on groundwater to maintain ecosystem function. GDEs were located surrounding the subject land.	Amphibians, aquatic avifauna and hunting avifauna as well as microchiropteran bats (foraging).
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 development.	Mobile threatened species such as avifauna, microchiropteran bats, arboreal mammals like <i>Phascolarctos cinereus</i> (Koala) and <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 entire area within the east of the subject land is zoned RU2, however careful planning of the project location has allowed for the retention of the majority of vegetation within the east of the subject land zoned RU2. The proposal will be positioned predominantly on an area that is highly disturbed as a result of previous sand mining, however the locations for the entrance roads were modified. Initial plans drafted for the proposal positioned an entry road along the northern boundary of the site from Mungo Brush Road, however this was deemed not viable by the client. The northernmost entry road was relocated to the centre of the proposal to facilitate an efficient and logical flow of traffic to direct traffic to the community facilities located at the centre of the proposal.

The specific path the northernmost entry road has undergone revision to avoid habitat trees and koala use trees present in the area. It has been located so that significant habitat features are avoided.

##### **7.1.2 Project design**

The proponent has considered biodiversity values present within the study area in the planning and detailed design stages of the development layout to avoid, where possible, direct impacts to identified biodiversity values. The current development layout has been selected, in part, to minimise impacts to significant biodiversity values, threatened matters and flora and fauna habitats present within the broader study area.

The proposal design has undergone revisions to avoid impacting areas of high biodiversity value such as the majority of Coastal Wetland Proximity Area, hollow-bearing trees and koala feed trees. The secondary access road was then relocated to follow a specific path chosen in consultation with ecologist which avoids impacting hollow-bearing trees and koala feed trees. Changes from previous plans to current plans include a change in the overall shape of the proposal so Coastal Wetland Proximity areas in the west are largely avoided. A 50m wide stretch of land in the north is now being retained and revegetated to improve connectivity between vegetation on either side of the proposal. Part of this corridor will require levelling prior to replanting therefore it has been considered as part of the subject land (impact area). Overall, four hollow bearing trees and three koala feed trees were avoided by the realignment of the secondary access while one new habitat tree will be impacted by the

changes to the primary access. A total of 1.32ha of PCT 3544 has been avoided while 0.04ha of PCT 3544 is now being impacted under the latest plans. First and second iterations of the design plans are shown in Figure 7.1 and 7.2. Figure 7.3 shows the difference between past and current impact area extents and highlights areas that have been avoided.

As shown in Figure 1.3 the development layout has been primarily restricted to areas of lower biodiversity value with some low maintained native vegetation (area previously subject to past sandmining), with the majority of intact native vegetation being retained.

The proposal has been designed such that the APZ overlaps with internal roads, walkways and infiltration areas. This has avoided impacting areas solely for the establishment of the APZ and has minimised the overall impact footprint.

The proposal design has incorporated technologies to minimise impact. Koala grids and fencing in the form of Koala exclusion fencing and koala friendly fencing have been strategically positioned within the proposal to assist movement of koala within the site. Also, light fixtures as part of the proposal will consider the Best Practice Lighting Design detailed in the *National Light Pollution Guidelines for Wildlife V 2.0* (DCCEEW 2023) to minimise the impact of light pollution on wildlife during the operational phase (See Figure 7.0) .

Fauna friendly lighting will include:

- Start with natural darkness and only add light for specific purposes
- Use adaptive light controls to manage light timing, intensity (eg. Dimmers) and colour
- Light only the object or area intended – keep lights close to the ground, directed, and shielded to avoid light spill
- Use the lowest intensity lighting appropriate for the task
- Use non-reflective, dark-coloured surfaces
- Use lights with reduced or filtered blue, violet and ultraviolet wavelengths.



**Figure 7.0: Lights should be shielded to avoid lighting beyond the target area or object (DCCEEW 2023).**



Figure 7.1 Previous Development Design Plans

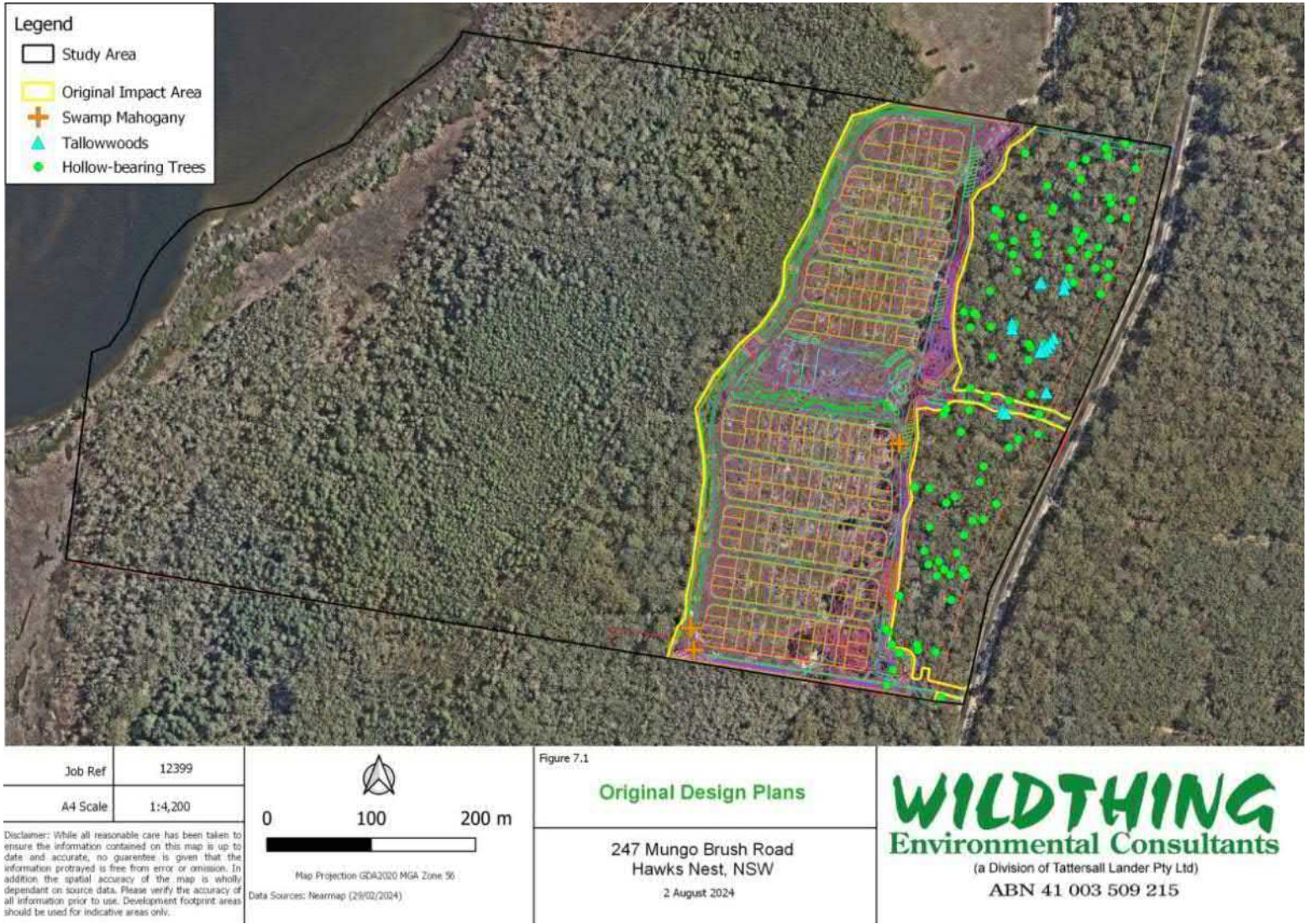


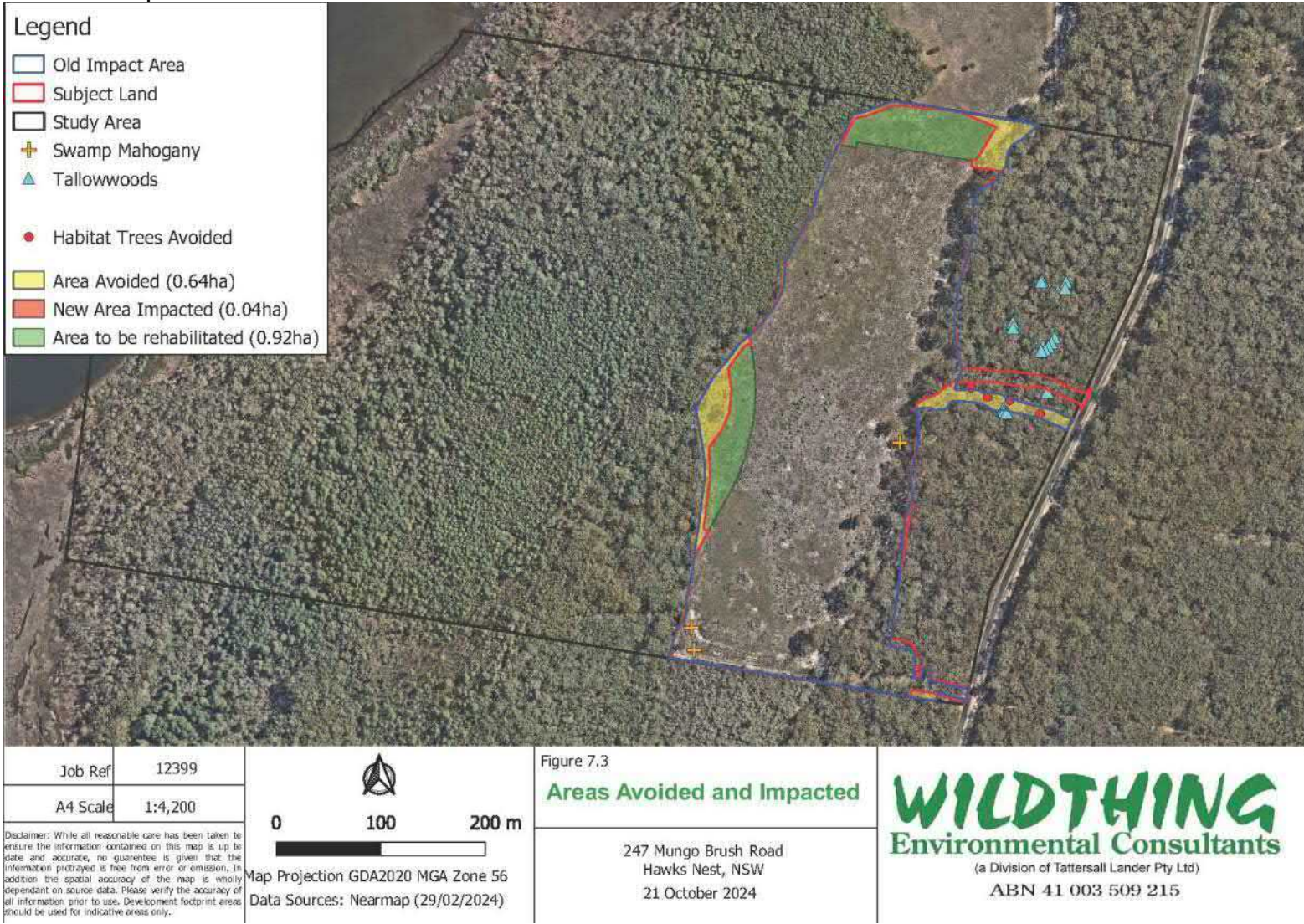


Figure 7.2 Original Design Plans with revised secondary access





Figure 7.3 Areas avoided and Impacted





The final layout and location of the proposed development has not been able to completely avoid all biodiversity values. Biodiversity values which cannot be avoided within the scope of the development have been detailed within Section 10.1.

No further recommendations of avoidance/minimisation were relevant to this phase of the development. Assessment of the residual impact from the layout has been assessed within Section 10.

## **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 from sand mining. The majority of the proposed development footprint has been positioned on a derived example of PCT 3544 which is subject to weed incursion and mostly does not contain canopy species. Biofilters and two Stormwater Infiltration Areas have been positioned in the north and west to facilitate wastewater for the proposed development (Tattersall Lander, 2024). The location of the proposed development will therefore minimise impact to Groundwater Dependent Ecosystems (GDEs). There are no prescribed streams or waterbodies within the subject land. The proposed location of the subdivision allows for the retention of native vegetation in the east and west of the study area and includes a revegetated fauna movement corridor in the north to facilitate the movement of ground and arboreal fauna to improve east to west connectivity.

### **7.2.2 Project design**

The project design had undergone revisions such that water management systems have been incorporated, positioned modified and increased to reduce the potential impact on GDEs (Tattersall Lander, 2024). Revisions of the Biofilter raingardens and the inclusion of an additional Stormwater Infiltration Area positioned in the west to facilitate wastewater for the proposed development (Tattersall Lander, 2024). The location of the proposed development will therefore minimise impact to Groundwater Dependent Ecosystems (GDEs). The modelling from the revision of the design plans demonstrates that there will be no surface water entering the retained vegetation area from the proposed development in any rainfall event up to the 1% AEP (100yr storm event). The modelling from the revisions of the designs also indicates that pollutant levels in infiltrated runoff will not be increased to the extent that the retained vegetation is detrimentally impacted. The revisions of the design plans will also avoid impacting some connectivity between retained vegetation to the east and west of the subject land, within the lot. The current design of the proposal has retained habitat connectivity in the west and east of the study area and has incorporated a planted wildlife movement corridor in the north to facilitate the movement of ground and arboreal fauna, which will enhance the east-west connection.

The proposal design has incorporated technologies to minimise prescribed impacts. Traffic calming devices in the form of raised thresholds and protruding street verge gardens have been strategically incorporated into the design to slow traffic, which will minimise vehicle collision.

### **7.3 Other measures considered**

A Vegetation Management Plan (VMP) has been prepared for the proposal. 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 protect and enhance areas of retained and planted native vegetation;
- To improve and increase the quality of habitat for threatened species known to utilise the subject land and maintain the east west movement corridor for native fauna species such as Koalas;
- To remove and manage weed species within retained vegetation;
- To create an east-west connection with the planting of a wildlife movement corridor in the north of the study area.
- To provide compensatory vegetation planting to retain and improve the quality of the vegetation corridor in the north of the study area.
- 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 the 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 10.30ha of native vegetation	<p>Locating the development area within a location that has been previously subject to sand mining. The majority of the strategically placed development area contains a low Vegetation Integrity (VI) score due to historic disturbance.</p> <p>A Vegetation Management Plan (VMP) has been prepared (Wildthing Environmental Consultants, 2024) that includes required planting within the proposed wildlife corridor in the north of the subject land and within the west of the subject land.</p>	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 to the north of the proposal.	During the Design phase	Project designer
Connectivity (habitat fragmentation) (Design phase)	<p>Project has been designed so that vegetation in the corridor along the east of the subject land is primarily retained and all vegetation within the west of the subject land is retained. Locating the project such that connectivity enabling movement of species and genetic material between areas of adjacent or nearby habitat is maintained.</p> <p>The proposal also includes required vegetation replanting under the VMP (Wildthing Environmental Consultants, 2024) to form a 50m wide planted vegetation corridor along the northern boundary.</p>	<p>The removal of vegetation for the proposal will create two narrow breaks for vehicle access along a north-south corridor running between the subject land and Mungo Brush Road. These breaks are unlikely to be considered to be significant.</p> <p>The 50m wide planted vegetation corridor along the northern boundary will enhance connectivity across the open area for vulnerable species such as Koalas.</p>	During the Design and construction phase	Project designer Project manager
Loss of Squirrel Glider habitat	A total of 1.60ha of Squirrel Glider habitat 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.	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	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	<p>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.</p> <p>The proposal also includes required vegetation replanting under the VMP to form a 50m wide planted vegetation corridor along the northern boundary to create a vegetation corridor in the north and facilitate movement between the west and east.</p>			
Impact on breeding populations	Timing of vegetation clearance should occur outside of the bird nesting season (late August - December)	Timing works to avoid critical life cycle events such as breeding for avifauna species.	During construction phase	Project manager
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. Light fixtures as part of the proposal will consider the Best Practice Lighting Design detailed in the National Light Pollution Guidelines for Wildlife V 2.0 (DCCEEW 2023) to minimise the impact of light pollution on wildlife during the operational phase (See Figure 7.1) .	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	<p>An increase in noise will occur during construction and operation of the proposal. Construction should not occur during the night, and as such would not impact on nocturnal species that may utilise adjacent habitats.</p> <p>The design of the proposal has strategically positioned street planting, stormwater infiltration areas, biofilters and revegetated areas between the road and retained vegetation to act as a noise buffer.</p>	<p>Larger distance between residence and retained vegetation to filter noise.</p> <p>No construction during night so nocturnal species will not be subject to noise during foraging.</p>	During the design phase and construction phase	Project designer and construction site manager.

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	A VMP and KPoM has been prepared (Wildthing Environmental Consultants, 2024a,b).			
Reduced viability of adjacent habitat due to dust	<p>Construction and operation may increase dust, in adjacent habitats. Dust can impact on a plant's ability to photosynthesise and may increase plant mortality in the adjacent vegetation. Locating perimeter roads, infiltration areas and walking paths between the development area and retained vegetation creates a buffer between conserved vegetation and the residences.</p> <p>The design of the proposal has strategically positioned street planting, perimeter roads, and walking paths between the road and retained vegetation to act as a dust trap.</p> <p>A VMP and KPoM has been prepared (Wildthing Environmental Consultants, 2024a,b).</p>	Larger distance between residence and retained vegetation to minimise dust pollution in adjoining vegetation.	During the design phase	Project designer
Reduced viability of adjacent habitat due to edge effects	<p>Construction and operation may increase edge effects in adjacent habitats. Locating perimeter roads, infiltration areas and walking paths between the development area and retained vegetation creates a buffer between conserved vegetation and the residences.</p> <p>A VMP and KPoM has been prepared (Wildthing Environmental Consultants, 2024a,b).</p>	Larger distance between residence and retained vegetation to minimise dust pollution in adjoining vegetation.	During the design phase	Project designer
Reduced viability of adjacent habitat due	Construction and operation may increase weed incursion in adjacent habitats. Locating perimeter roads,	Larger distance between residence and retained	During the design phase	Project designer

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
to weed incursion	<p>infiltration areas and walking paths between the development area and retained vegetation creates a buffer between conserved vegetation and the residences.</p> <p>Educational signage will also be installed at key locations along this boundary fencing with the primary aim to alert residents of the environmental significance of the retained vegetation and activities that are prohibited in this area, such as dumping of lawn clippings.</p> <p>A VMP and KPoM has been prepared (Wildthing Environmental Consultants, 2024a,b).</p>	vegetation to minimise dust pollution in adjoining vegetation.		
Increase in predatory species populations	<p>Predatory species, such as wild dog already inhabit areas within and surrounding the Subject Land. However, the proposal may increase the presence of domestic and feral cat. There is also the possibility that other indirect impacts, such as an increase in rubbish dumping, may encourage predatory species into the area.</p> <p>Domestic pet ownership is to be in accordance with the Companion Animals Act 1998 and should be governed by the site manager.</p> <p>Educational signage will be installed at key locations along this boundary fencing with the primary aim to alert residents of the environmental significance of the retained vegetation and activities that are prohibited in this area, such as dumping of rubbish.</p>	Minimise the occurrence of predators within the subject land.	During the design, construction and operational phase	Project designer, construction site manager and operational site manager



Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	A VMP and KPoM has been prepared (Wildthing Environmental Consultants, 2024a,b).			
Impact to adjoining native vegetation and habitat from human incursion	Erection of strategically placed fauna friendly fencing along the development boundary with educational signage and 'no go area' signage. Signage is to be installed at key locations along this boundary fencing with the primary aim to alert residents of the environmental significance of the retained vegetation and activities that are prohibited in this area, such as wood collection, dumping of rubbish and lawn clippings, bike riding, dog walking and foraging for flowers.	Inform and educate of the environmental significance of adjoining vegetation.	Construction and operational phase	Construction site manager and Project manager
Impact on waterbodies, water quality and hydrological processes	<p>Silt fencing and controls on sediment and runoff must be implemented prior to any construction within the subject land. This fencing is to be maintained during the construction phase.</p> <p>For the operational phase the proposal includes Biofilter rain gardens and stormwater infiltration areas to minimise impacts on surface water quality and quantity as well as negate impacts from water mounding.</p>	<p>The subdivision area has been located to minimise direct impacts on waterbodies and prescribed streams. Groundwater Dependent Ecosystems are located within east of the study area.</p> <p>Minimise impacts on surface water quality and quantity. A biofilter has been included in the design of the proposal.</p>	During the Design phase and construction phase	Project designer and construction site manager
Increased risk of starvation, exposure and loss of shade or shelter	Construction works for the proposal should avoid any impact to mature trees and hollow-bearing trees. The proposal has been predominately positioned within an area that been subject to previous sand mining. The majority of vegetation will be retained within the subject land. The VMP (Wildthing Environmental Consultants, 2024) contains required planting within the proposed	The retention of mature trees, hollow-bearing trees and native vegetation within the study area as well as the required replanting of the fauna corridor will provide food and shelter resources within the immediate locality.	During the Design phase and construction phase	Project designer

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	<p>fauna corridor and within the western stormwater infiltration area.</p> <p>Therefore, required replanting of vegetation under the VMP along the retained vegetation to the east and west will also minimise the risk of exposure and loss of shade, shelter and food resources.</p>			
Clearing of native vegetation	<p>Where possible, construction works 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"> <li>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;</li> <li>where a tree must be disturbed the priority should be given to pruning rather than clearing; and</li> <li>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;</li> </ul> <p>Individual trees that are to be retained within close proximity to the primary and secondary access are to be protected during construction by temporary fence around the dripline.</p>	Retention of mature trees and hollow-bearing trees within the retained native vegetation in the study area will facilitate the movement of mobile threatened species and provide foraging, nesting and shelter/shade resources.	Prior to and during vegetation clearing in the construction phase	Construction site manager
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"> <li>all material stockpiles, vehicle parking and machinery storage will be located within areas</li> </ul>	Avoid inadvertent impact to biodiversity values	Prior to and during vegetation clearing	Construction site manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	<p>proposed for clearing, and not in areas of native vegetation that are to be retained; and</p> <ul style="list-style-type: none"> <li>implementation of temporary stormwater controls during construction and to ensure that discharges outside the development footprint are consistent with existing conditions.</li> </ul>			
Clearing of fauna habitat, resulting in arboreal fauna injury and/or mortality	<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>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>	Clearing of fauna habitat, resulting in fauna injury and/or mortality	During vegetation clearing	Construction site manager
Clearing of fauna habitat, resulting in ground dwelling fauna injury and/or mortality	<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>Vegetation within the subject land is to undergo pre-clearance searches for ground dwelling species to relocate captured specimens into the retained vegetation on the other side of the barrier fencing.</p>	Clearing of fauna habitat, resulting in fauna injury and/or mortality	During vegetation clearing	Construction site manager



Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
Clearing of fauna habitat and displacement of resident fauna	<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"> <li>• seeking consultation with a suitably qualified ecologist to determine the best time to schedule clearance works to avoid nesting and breeding times for resident fauna;</li> <li>• 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;</li> <li>• 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;</li> <li>• 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</li> </ul>	Avoid fauna injury and/or mortality during clearing of vegetation.	During vegetation clearing	Construction site manager

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	<p>demarcated for removal this tree should be left to fell until the following day;</p> <ul style="list-style-type: none"> <li>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</li> <li>all hollow logs and felled trees would be inspected by the ecologist before relocation into areas of similar adjacent habitat</li> </ul> <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 rehabilitation would be delivered post-veterinary care to an appropriate animal rehabilitator associated with Wildlife In Need of Care (WINC) (Rescue Hotline 1300 946 295) or The Myall Koala &amp; Environment Group Inc. (Wildlife rescue 041806280483).</p> <p>All fauna sightings/captures are to be recorded and uploaded to the NSW BioNet Atlas.</p>			
Loss of significant habitat features	<p>Habitat salvage within the development footprint should be undertaken prior to and during clearance activities, with the salvage methodology including the following key aspect:</p> <ul style="list-style-type: none"> <li>Tree limbs containing natural hollows</li> </ul>	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

Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	<p>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 (2 nest boxes installed per hollow removed).</p> <p>Where removal of woody debris is required:</p> <ul style="list-style-type: none"> <li>dead trees and woody debris that are removed (diameter &gt;10 cm) are to be placed in the nearest adjacent area of similar habitat under supervision of a suitably qualified ecologist.</li> </ul>			
Transport of weeds and pathogens from the site to adjacent vegetation	<p>The following measures are to be implemented to prevent exotic plant material from entering/exiting the subject land:</p> <ul style="list-style-type: none"> <li>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 bulbs, root fragment, tubers or rhizomes; and</li> <li>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</li> </ul> <p>A clean down register to be maintained at the entry of the study area</p>	Minimise weed infestations within adjoining vegetation	Prior to and during vegetation clearing	Construction Site Manager
Impact to adjoining native vegetation	Erection of fauna friendly fencing along the development boundary with educational signage.	Inform and educate of the environmental significance of	Construction and operational	Construction site manager and



Impact	Avoidance and Minimisation Action	Outcome	Timing	Responsibility
	Signage is to be installed at key locations along this boundary fencing with the primary aim to alert residents of the environmental significance of the retained vegetation and activities that are prohibited in this area.	adjoining vegetation.	phase	Project manager
Vehicle strike	Implementation of a low-speed limit entering and within the development area. Koala signage is to be erected. Traffic calming devices have been incorporated into the design.	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 the 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 PCT3544 - Coastal Sands Apple-Blackbutt Forest	-	-	No	Construction and operation	10.30
Removal of <i>Petaurus norfolcensis</i> (Squirrel Glider) habitat	V	-	No	Construction and operation	1.60
Removal of <i>Phascolarctos cinereus</i> (Koala) habitat	E	E	No	Construction and operation	1.60
Removal of <i>Ninox strenua</i> (Powerful Owl) habitat	V		No	Construction and operation	1.06
Removal of <i>Potorous tridactylus</i> (Long-nosed Potoroo) habitat	V	V	No	Construction and operation	1.06

### 8.1.2 Change in vegetation integrity score

Table 8.2 documents change in vegetation integrity score on the subject land associated with the 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 3544 _Good	3544	N/A	1.06	59.3	64.6	68	63.9	0	0	0	0	-63.9
PCT 3544_Moderaten	3544	N/A	0.54	46.1	23.7	70.1	42.5	0	0	0	0	-42.5
PCT 3544 _Derived	3544	N/A	8.70	21.7	4.5	19.1	12.3	0	0	0	0	-12.3

## 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 the 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	Surrounding vegetation outside the subject land boundary	During rainfall or heavy storm events	Long-term	Construction and operation phase	During the construction and operation phase, potential sediment and contaminated runoff into adjacent vegetation, including groundwater dependent ecosystems is likely to occur during high rainfall events. Two designated stormwater



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
						infiltration areas will be established for the operational phase. They have been designed to contain mounting of stormwater for a 100year storm event scenario.
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. Two designated stormwater infiltration areas will be established for the operational phase. They have been designed to contain mounting of stormwater for a 100year storm event scenario.
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 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	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 proposal increases the risk of inadvertent impacts on adjacent habitat and vegetation.
Reduced viability of adjacent habitat due	Adjacent vegetation	Surrounding vegetation outside the	During the operation phase	Long-term	Construction and operation phase	The subject land borders a vegetation corridor running along the eastern boundary. Removal of vegetation from the subject land increases

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
to edge effects		subject land boundary				the risk of edge effects occurring within the corridor.
Fertiliser and herbicide drift	Adjacent vegetation.	Surrounding vegetation outside the subject land boundary	During the operation phase	Long-term	Construction and operation phase	Landscaping within the development footprint may increase fertiliser and herbicide drift into adjacent vegetation.
Rubbish dumping	Adjacent vegetation	Surrounding vegetation outside the subject land boundary	During the operation phase	Long-term	Construction and operation phase	The development may increase the occurrence of rubbish dumping within adjoining vegetation
Wood collection	Adjacent vegetation	Surrounding vegetation outside the subject land boundary	During the operation phase	Long-term	Construction and operation phase	The development may increase the occurrence of wood collection from within adjoining vegetation
Fragmentation of movement corridor	Mammals and reptiles	Surrounding vegetation outside the subject land boundary	During the operation phase	Long-term	Construction and operation phase	The development includes two access roads within the eastern vegetation corridor which may impact the movement of fauna.
Increase in predatory species populations	All fauna species	Surrounding vegetation outside the subject land boundary	During the operation phase	Long-term	Operation phase	Although it is recommended that responsible pet ownership is observed within the proposal, there is potential that residents may allow domestic pets such as cats to roam freely and access adjoining vegetation.

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
Impact to adjoining native vegetation and habitat from human incursion	Adjacent vegetation and fauna species	Surrounding vegetation outside the subject land boundary	Daily during the construction phase and ongoing during the operation phase	Long-term	Construction and operation phase	Despite signage, the development may increase the occurrence of human incursion within adjoining vegetation.



### **8.3 Prescribed impacts**

All prescribed impacts identified in Section 6.0 assessed as occurring within the subdivision area as a result of the 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*

No areas of non-native vegetation were identified within the subject land or study area.

##### *8.3.1.2 Extent*

NA

##### *8.3.1.3 Duration*

NA

##### *8.3.1.4 Consequences*

NA

##### *8.3.1.5 Residual prescribed impact*

NA

#### **8.3.2 Habitat connectivity**

##### *8.3.2.1 Nature*

Small breaks in north south corridor along the western side if Mungo Brush Road.

##### *8.3.2.2 Extent*

Clearing approximately 10m wide.

##### *8.3.2.3 Duration*

The construction and operational phase.

##### *8.3.2.4 Consequences*

Two access roads crossing the eastern habitat corridor may restrict movement of mobile mammal species, notably Koala. The access roads through the habitat corridor will increase the potential for vehicle strike and will create artificial light spill into the corridor.

##### *8.3.2.5 Residual prescribed impact*

Minimisation and mitigation measures have been detailed within Table 7.1. Implementation of a 50m wide habitat corridor across the far north of the subject land.

### 8.3.3 Waterbodies, water quality and hydrological processes

#### 8.3.3.1 Nature

Within the subject land water will quickly infiltrate through the sandy soil. Some periodic surface water may form within the study area to the west of the subject land within the area of Swamp Sclerophyll Forest. 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

One GDE's - PCT 3544 - Coastal Sands Apple-Blackbutt Forest was found to be present within the subject land and 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. PCT 4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest occurring within the study area to the immediate west of the subject land contained flora species that are “obligate” (more dependent on direct groundwater contact). A list of GDE's present in the subject land and study area 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 Dependency
PCT 3544 - Coastal Sands Apple-Blackbutt Forest	Terrestrial Vegetation	Facultative
PCT 4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest	Swamp Forest	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

Biofilters have been positioned in the north and west to facilitate wastewater for the proposed development (Tattersall Lander, 2024). Two Stormwater Infiltration Areas have also been incorporated into the design to allow no surface water spillage into the existing vegetation (Tattersall

Lander, 2024). The location of the proposed stormwater controls will therefore minimise impact to Groundwater Dependent Ecosystems (GDEs). These biofilters will infrequently overflow during periods of heavy rainfall and has the potential to increase the concentration of contaminants flowing to the west. Two designated stormwater infiltration areas will be established for the operational phase. They have been designed to contain mounting of stormwater for a 100year storm event scenario.

Impacts concerning groundwater and surface water connectivity, managing risks to groundwater quality, and the vulnerability of groundwater-dependent ecosystems, are central to understanding and managing linkages between land-derived sources of contaminants, their accession to groundwater and their transport to receiving environments. Actions aimed at mitigating the transport of nutrients and pesticides to the retained vegetation within the subject land have focussed on surface water processes and pathways of delivery. Mitigating measures have been implemented in the form of Biofilters to reduce inputs of land-derived contaminants, particularly nutrients, pesticides and suspended sediment. Excessive rainwater events may facilitate fluxes of nitrogen, phosphorus, and herbicides that impair photosynthesis (PSII herbicides) into the vegetation within the study area. The presence in surface waters of undesirable concentrations of PSII herbicides poses a threat to ecosystem health, with effects likely to range from temporary impairment of photosynthetic activity, to longer-term changes in community structure as a result of chronic exposure (Lewis et al. 2009). Similarly, excessive levels of N and P in surface waters can lead to a loss of biodiversity and a proliferation of undesirable species such as macroalgae (Fabricius 2005). Two designated stormwater infiltration areas will be established for the operational phase. They have been designed to contain mounting of stormwater for a 100year storm event scenario.

The modelling demonstrates that there will be no surface water entering the retained vegetation area from the proposed development in any rainfall event up to the 1% AEP (100yr storm event). The modelling also indicates that pollutant levels in infiltrated runoff will not be increased to the extent that the retained vegetation is detrimentally impacted (Tattersall Lander, 2024).

#### 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 east of the subject land.

#### 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

1. 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 and study area 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>Ninox strenua</i> (Powerful Owl);	No	Unlikely	Unknown	Injury, mortality, reduction in local population
<i>Phascolarctos cinereus</i> (Koala); and	No	Low	Unknown	Injury, mortality, reduction in local population
<i>Potorous tridactylus</i> (Long-nosed Potoroo)	No	Low	Unknown	Injury, mortality, reduction in local population
<i>Glossopsitta pusilla</i> (Little Lorikeet)	No	Unlikely	Unknown	Injury, mortality, reduction in local population
<i>Haliaeetus leucogaster</i> (White-breasted Sea-Eagle)	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 proposal includes a Biofilter to minimise impacts on surface water quality and quantity. Two designated stormwater infiltration areas will be established for the operational phase. They have been designed to contain mounting of stormwater for a 100year storm event scenario.	Inclusion of biofilters and stormwater infiltration areas 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	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)
		should be controlled during the project.					
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	Fence off areas of habitat to prevent access. Weed control, control light spill and filter noise.	Erection of fencing along the boundary of retained vegetation and educational signage erected in key locations.  Conduct routine weed control in accordance with the VMP (Wildthing Environmental Consultants, 2024)	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 the	Erection of fencing along the boundary of retained vegetation and educational signage erected in key locations. The signage is to	Installed during the construction phase and for perpetuity of the	Construction and operational	Project manager	Moderate efficacy with a moderate risk of	No



Residual Impact	Mitigation measure	Method/technique	Timing	Frequency	Responsibility	Likely efficacy	MNES (when relevant)
	subject land.  Reduce use of fertilisers and herbicides.	outline the environmental significance of the retained vegetation and list prohibited actions within the retained vegetation	operational phase	phase		failure.	
Fragmentation of movement corridor	Plantings, street trees and fauna movement corridors are to be implemented in the proposal design.	Plantings, street trees and fauna movement corridor	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
Vehicle strike	Low speed limits, traffic calming devices	Implementation of a 15km/h speed limit, Koala signage and traffic calming devices in the form of raised thresholds and protruding street verge gardens..	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"> <li>No Cliffs within the subject land; and</li> <li>Not within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels.</li> </ul>
Swift Parrot	<i>Lathamus discolor</i>	Yes	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"> <li>Caves;</li> <li>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';</li> <li>observation type code 'E nest-roost' with numbers of individuals &gt;500 or from the scientific literature</li> </ul>
Large Bent-winged-bat	<i>Miniopterus orianae oceanensis</i>	No	Species was not recorded. No breeding habitat for this species was located within the development area, including: <ul style="list-style-type: none"> <li>Caves;</li> <li>Cave, tunnel, mine, culvert or other structure known or suspected to be used for breeding including species records in</li> </ul>

Common name	Scientific name	Further SAI assessment required?	Reason for exclusion from further assessment if no further SAI assessment is required
			<p>BioNet with microhabitat code 'IC – in cave';</p> <ul style="list-style-type: none"> <li>observation type code 'E nest-roost' with numbers of individuals &gt;500 or from the scientific literature</li> </ul>
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 cliff lines.
Eastern Cave Bat	<i>Vespadelus trougtoni</i>	No	<p>None of the following were consistent with the subject land:</p> <ul style="list-style-type: none"> <li>Caves; and</li> <li>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</li> </ul>
Eastern cave bat	<i>Vespadelus trougtoni</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

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.



## 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. As PCT 3544\_Derived has a vegetation integrity score  $\leq 15$  (12.3) an offset for this vegetation zone was not required.

**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 3544_Good	Coastal Sands Apple-Blackbutt Forest	N/A	1.06	63.9	0	-63.9	1.5	26
PCT 3544_Moderate	Coastal Sands Apple-Blackbutt Forest	N/A	0.54	42.5	0	-42.5	1.5	9
PCT 3544_Derived	Coastal Sands Apple-Blackbutt Forest	N/A	8.70	12.3	0	-12.3	1.5	0
<b>Total</b>								35

### 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 3544_Good	Powerful Owl	<i>Ninox strenua</i>	V	Not listed	1.06ha	2	34
						<b>Subtotal</b>	<b>34</b>
PCT 3544_Good	Squirrel Glider	<i>Petaurus norfolcensis</i>	V	Not listed	1.06ha	2	34
PCT 3544_Moderate	Squirrel Glider	<i>Petaurus norfolcensis</i>	V	Not listed	0.54ha	2	11
						<b>Subtotal</b>	<b>45</b>
PCT 3544_Good	Koala	<i>Phascolarctos cinereus</i>	E	E	1.06ha	2	34
PCT 3544_Moderate	Koala	<i>Phascolarctos cinereus</i>	E	E	0.54ha	2	11
						<b>Subtotal</b>	<b>45</b>
PCT 3544_Good	Long-nosed Potoroo	<i>Potorous tridactylus</i>	V	V	1.06	2	34
						<b>Subtotal</b>	<b>34</b>
						<b>Total</b>	<b>158</b>

#### **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**

The subject land did not overlap with mapped biodiversity values.



## 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)
26	PCT3544 Coastal Sands Apple-Blackbutt Forest_Good	Coastal Dune Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub/grass-formation)	N/A	Coastal Dune Dry Sclerophyll Forests - < 50% cleared group (including Tier 4 or higher threat status).	Yes	Karuah Manning
9	PCT3544 Coastal Sands Apple-Blackbutt Forest_Moderate	Coastal Dune Dry Sclerophyll Forests	Dry Sclerophyll Forests (Shrubby sub/grass-formation)	N/A	Coastal Dune Dry Sclerophyll Forests - < 50% cleared group (including Tier 4 or higher threat status).	No	Karuah Manning
Total 35							

## 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
Powerful Owl	<i>Ninox strenua</i>	V	Not listed	1.06ha	2	34
Long-nosed Potoroo	<i>Potorous tridactylus</i>	V	V	1.06ha	2	34
Squirrel Glider	<i>Petaurus norfolcensis</i>	V	Not listed	1.60ha	2	45
Koala	<i>Phascolarctos cinereus</i>	E	E	1.60ha	2	45
<b>Total</b>						158

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

### 12.1 Chapter 3 Koala Habitat Protection 2020

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

Chapter 3 applies to land that the Chapter 4 does not apply to as defined in Schedule 2 of SEPP (Biodiversity Conservation) 2021. This includes land zoned as Zoned RU2 - Rural Landscape in the Mid Coast Council LGA. This Chapter applies to areas of more than one hectare or an area, which has together with any adjoining land in the same ownership an area of more than 1 hectare, whether or not the development application applies to the whole, or only part of the land. The study area constitutes an area over 1ha therefore Chapter 3 is addressed below. In addressing this Chapter there are two questions to be considered.

#### 12.1 First Consideration – Is the Land ‘Potential Koala Habitat’?

‘Potential Koala Habitat’ is defined in SEPP44 as, “...an area of native vegetation where trees of the type listed in Schedule 2 (Koala feed tree species) constitute at least 15% of the total number of trees in the upper or lower strata of the tree component”.

Two tree Species *Eucalyptus robusta* (Swamp Mahogany) and *Eucalyptus microcorys* (Tallowwood) a Koala Feed Tree species listed in Schedule 2 (Koala feed tree species) were recorded in the study area. Very few specimens of these two feed tree species were present within the eastern portion of the study area containing the subject land (development footprint). However, specimens of *E. robusta* are likely to constitute at least 15% of the total number of trees in the upper or lower strata of the tree component” within an area of Swamp Sclerophyll Forest outside the development footprint to the west. Therefore, the study area would be considered to constitute ‘Potential Koala Habitat’ and accordingly further provisions of this policy would apply. Only a small number of specimens of *E. microcorys* were recorded within the study area.

#### 12.2 Second Consideration – Is the Land Core Koala Habitat?

Core Koala Habitat is defined in SEPP 44 as “... an area of land with a resident population of Koalas, evidenced by attributes such as breeding females (that is females with young) and recent sightings and historical records of a Koala population.

An assessment by Eco Logical Australia in 2022 detected koalas within the study area through acoustic recording (Eco Logical Australia 2023). No evidence of Koala Activity was recorded within the site during fieldwork which included spotlighting and Koala Spot Assessments (Appendix J). Studies completed for the Draft Koala Plan of Management for North Hawks Nest (KPoM) (Biolink, 2005) have mapped an area in the east containing *E. microcorys* as High and Medium Use Core Koala Habitat. This area of Core Koala Habitat also extended further east over Mungo Brush Road where specimens of *E. microcorys* were also present. According to the Draft KPoM areas containing Tallowwood even if under 15% of tree species present would be regarded as Potential Koala Habitat. As Koalas were recorded within this area during studies conducted in 2004 areas containing Tallowwood would be considered to constitute Core Koala Habitat. Given the assumed presence of the Koala within the study area Core Koala Habitat therefore includes all areas mapped as PCT1648 Good Condition and PCT1648 Moderate condition. As Core Koala habitat was considered to be present within the study area and subject land an Individual Koala Plan of Management has been prepared (Wildthing Environmental Consultants, 2024b).

The proposal will result in the removal of three (3) specimens of *E. robusta* (Koala Feed Trees). Compensatory plantings of *E. robusta* will be utilised within the 50m wide east west corridor which will run along the northern boundary of the subject land.



## 13.0 Considerations Under State Environmental Planning Policy (Resilience and Hazards) 2021

### 13.1 Chapter 2 Coastal Management

#### Part 2.1 Preliminary

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

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

This Chapter identifies four coastal management areas that comprise the coastal zone. These are:

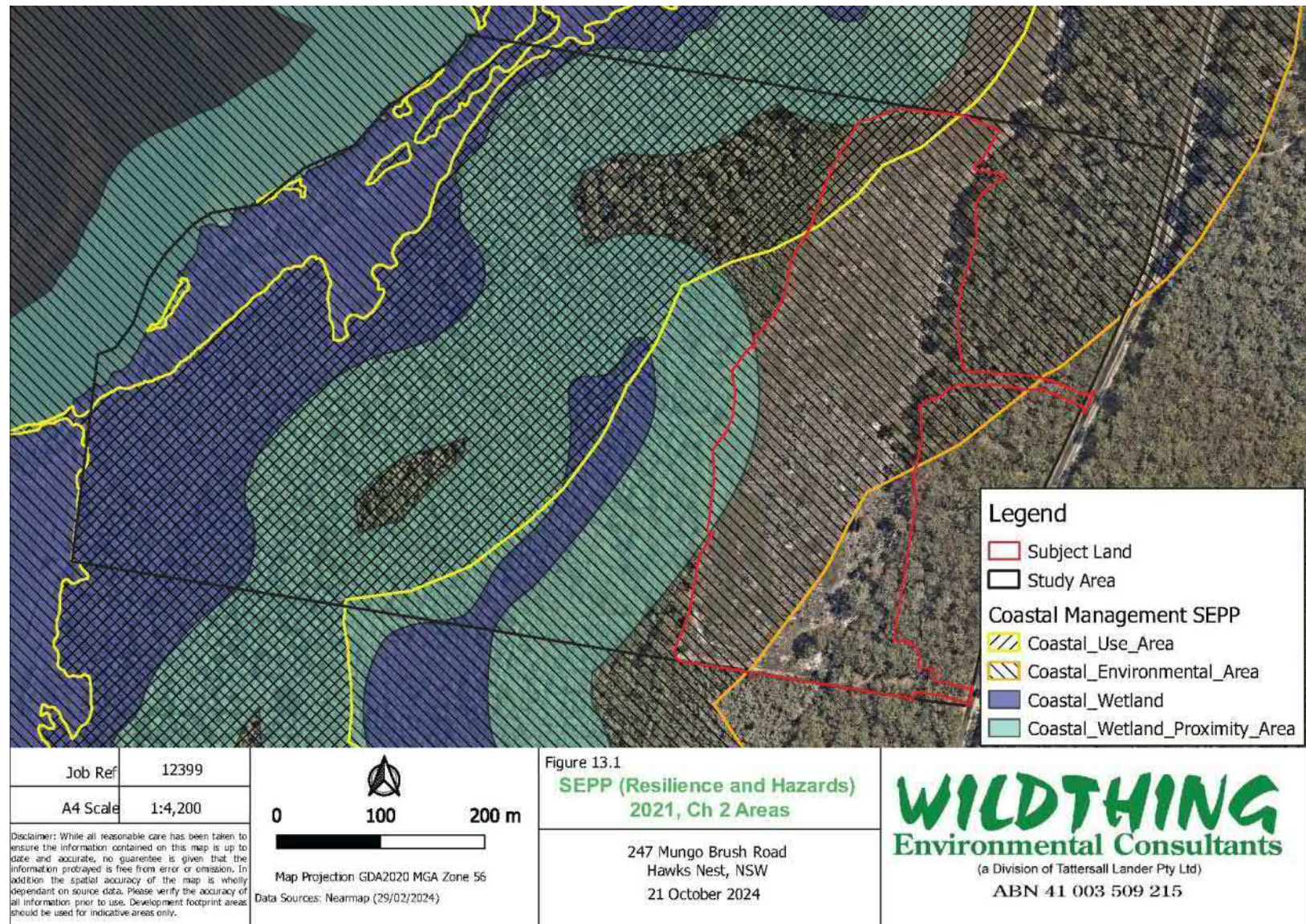
- the coastal wetlands and littoral rainforests area,
- the coastal vulnerability area,
- the coastal environment area, and
- the coastal use area.

Chapter 2 imposes targeted development controls for these areas to guide appropriate development within the coastal zone.

The study area contained areas of Coastal Wetland, Coastal Wetland Proximity, Coastal Use and Coastal Environment Area. A large area of the subject land (development footprint) contained the Coastal Environment Area as well as a smaller area of Coastal Use Area in the far north west (Figure A3.1). The study area did not contain littoral rainforests. Areas of Coastal Wetland Proximity are located adjacent to portions of the western boundary of the subject land.

The location of Chapter 2 areas identified within and in proximity to the subject land are shown in Figure 13.1. As the subject land is located within a mapped area of “Coastal Environment Area” and “Coastal Use Area”, the development controls for this area, as listed within Division 1 of the Chapter 2 have been addressed.

Figure 12.1 (Resilience and Hazards) Chapter 2





## Part 2.2 Development controls for coastal management areas

### Division 1 Coastal wetlands and littoral rainforests area

#### 2.8 Development on land in proximity to coastal wetlands or littoral rainforest

Note—

*The Coastal Wetlands and Littoral Rainforests Area Map identifies certain land that is inside the coastal wetlands and littoral rainforests area as “proximity area for coastal wetlands” or “proximity area for littoral rainforest” or both.*

1. *Development consent must not be granted to development on land identified as “proximity area for coastal wetlands” or “proximity area for littoral rainforest” on the Coastal Wetlands and Littoral Rainforests Area Map unless the consent authority is satisfied that the proposed development will not significantly impact on—*

- a) the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or littoral rainforest, or*

0.41ha within the western boundary of the subject land is within mapped Coastal Wetland Proximity Area. A designated stormwater infiltration area will be established within this area for the operational phase of the proposal. There will also be a stormwater infiltration area constructed within the north of the subject land. These stormwater infiltration areas have been designed to contain mounding of stormwater for a 100year storm event scenario (Please see pages 25-27 of the Stormwater Management Report (Tattersall Lander, 2024)). Adjoining vegetation contains the EEC Swamp Sclerophyll Forest. Measures to avoid, minimise and mitigate impacts on the biophysical, hydrological or ecological integrity of adjoining vegetation have been detailed within Section 7 and 8 of this report that may result from the proposal.

- b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.*

0.41ha within the western boundary of the subject land is within mapped Coastal Wetland Proximity Area. The proposal involves the construction of a stormwater infiltration area within this mapped area. The topsoil will be removed, stockpiles and redistributed following reshaping of the infiltration area. Planting of canopy species consistent with PCT3544 will be undertaken in accordance with the VMP (Wildthing Environmental Consultants, 2024) and regeneration of groundcovers, shrubs and mid story species is expected to occur from the seedbank within the top soil. The impacts within this area may involve overflow run-off from infiltration areas within the proposal during heavy rain events at a frequency of approximately two times a year. These stormwater infiltration areas have been designed to contain mounding of stormwater for a 100year storm event scenario (Please see pages 25-27 of the Stormwater Management Report (Tattersall Lander, 2024)) and have been considered as an impact area in the BAM-C and offset accordingly.

2. *This section does not apply to land that is identified as “coastal wetlands” or “littoral rainforest” on the Coastal Wetlands and Littoral Rainforests Area Map.*

N/A

### **DIVISION 3 COASTAL ENVIRONMENT AREA**

#### **2.10 Development on land within the coastal environment area**

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

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

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

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

(3) This section does not apply to land within the Foreshores and Waterways Area within the meaning of State Environmental Planning Policy (Biodiversity and Conservation) 2021, Chapter 6.

All stormwater runoff from the development will be captured by a Water Quality Infiltration Structure and cleaned before it exits the site, therefore the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment or water quality of the marine estate is not likely to be impacted. The proposal is not likely to cause an adverse impact on the remainder of the dot points.

### **DIVISION 4 COASTAL USE AREA**

#### **2.11 Development on Land within The Coastal Use Area**

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



- has considered whether the proposed development is likely to cause an adverse impact on the following:
  - existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,
  - overshadowing, wind funnelling and the loss of views from public places to foreshores,
  - the visual amenity and scenic qualities of the coast, including coastal headlands,
  - Aboriginal cultural heritage, practices and places,
  - cultural and built environment heritage, and
- is satisfied that:
  - the development is designed, sited and will be managed to avoid an adverse impact referred to in paragraph (a), or
  - if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or
  - if that impact cannot be minimised—the development will be managed to mitigate that impact, and
- has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development.

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

The proposal is not likely to cause an adverse impact on the Coastal Use Area.

## 14.0 NSW Biosecurity Act 2015

Nine 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 14.1 Priority Weed species found within the subject land and study area.**

WEED SPECIES	LEGAL REQUIREMENTS	ADDITIONAL SIGNIFICANCE
<i>Asparagus asparagoides</i> Bridal Creeper	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure (Hunter)	T
<i>Cortaderia selloana</i> Pampas Grass	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure (Hunter)	T
<i>Eragrostis curvula</i> African Lovegrass	General Biosecurity Duty Regional Recommended Measure (Hunter)	T
<i>Hyparrhenia hirta</i> Coolatai Grass	General Biosecurity Duty Regional Recommended Measure	T
<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure	N, T
<i>Senecio madagascariensis</i> Fireweed	General Biosecurity Duty Regional Recommended Measure	N
<i>Lantana camara</i> Lantana	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure (Hunter)	N, T
<i>Asparagus aethiopicus</i> Ground Asparagus	General Biosecurity Duty Prohibition on dealings Regional Recommended Measure	
<i>Cinnamomum camphora</i> Camphor Laurel	General Biosecurity Duty Regional Recommended Measure	

**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

The introduced *Pinus elliotii* (Slash Pine) was found to be numerous in the western portion of the study area. Weed control has been completed within the Vegetation Management Plan (VMP) (Wildthing Environmental Consultants, 2024a).

## **15.0 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 (DotE, 2013) to address the significant impact criteria for following EPBC listed threatened communities and species;

- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland
- *Potorous tridactylus* (Long-nosed Potoroo) Vulnerable
- *Pteropus poliocephalus* (Grey Headed Flying Fox) – Endangered
- *Phascolarctos cinereus* (Koala) – Endangered

The significant impact criteria found that there will not likely to be a significant impact to Coastal Swamp Sclerophyll Forest, the Long-nosed Potoroo, Grey Headed Flying Fox and Koala.

## **16.0 Public Inquiry into the Ecological Significance of Land cover by the North Hawks Nest Draft Local Environment Study (2002)**

A Public Inquiry was undertaken in 2001 and 2002 to examine and report on the ecological significance of land covered by the North Hawks Nest Draft Local Environmental Study (LES) of which the study area was located within. The Public Inquiry set out to examine the importance of the LES 1 Study Area to the survival of the local Koala Population, allocate core and secondary koala habitat areas, and identify local and regionally significance of the land for flora and fauna, its habitat and biodiversity in general. The Inquiry found that nearly all of the native vegetation of the Study Area was of significance to threatened species including koala, eastern blossom bat, large footed myotis and squirrel glider, and requires full conservation and protection.



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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	<b>Information</b>	
		Introduction to the biodiversity assessment including:	–
		☒ brief description of the proposal	1.1.3
		☒ identification of subject land boundary, including:	1.1.2
		☒ operational footprint	
		☒ 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	
		☒ identification and justification for entering the BOS	Table 1.1
		<b>Maps and tables</b>	
		☒ 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 1.6
Landscape	Sections 3.1 and 3.2, Appendix E	<b>Information</b>	
		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
		☒ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.))	3.2.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<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.))	3.2.2
		<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
		<b>Maps and tables</b>	
		<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	Figure 1.1
		<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	
		Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Map include:	
		<input type="checkbox"/> IBRA bioregions and subregions	Figure 3.1
		<input checked="" type="checkbox"/> rivers, streams and estuaries	Figure 3.2
		<input checked="" type="checkbox"/> wetlands and important wetlands	Figure 3.4
		<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 checked="" 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 type="checkbox"/> NSW (Mitchell) landscape on which the subject land occurs	
		<b>Data</b>	
		<input checked="" type="checkbox"/> All report maps as separate jpeg files	—
		Individual digital shape files of:	—
		<input checked="" type="checkbox"/> subject land boundary	—
		<input checked="" type="checkbox"/> assessment area (i.e. subject land and 1500 m buffer area) boundary	—
		<input checked="" type="checkbox"/> cadastral boundary of subject land	—
		<input checked="" type="checkbox"/> areas of native vegetation cover	—
		<input checked="" type="checkbox"/> landscape features	—
Native vegetation	Chapter 4, Appendix A and Appendix H	<b>Information</b>	
		<input checked="" type="checkbox"/> Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1)	4.1



BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input 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)	
		<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)	4.1.1
		<input checked="" type="checkbox"/> Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2	2.1
		<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)	2.3.2
		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
		<input checked="" type="checkbox"/> extent (ha) within subject land	4.2.1
		<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.))	Table 4.2, 4.3, 4.4, 4.5 and 4.6
		<input checked="" type="checkbox"/> plant species relied upon for identification of the PCT and relative abundance of each species	Table 4.2, 4.3, 4.4, 4.5 and 4.6
		<input checked="" type="checkbox"/> if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	Table 4.2, 4.3, 4.4, 4.5 and 4.6
		<input checked="" type="checkbox"/> estimate of per cent cleared value of PCT (BAM Subsection 4.2.1(5.))	Table 4.2, 4.3, 4.4, 4.5 and 4.6
		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)	4.4
		<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)	4.4
		<input checked="" type="checkbox"/> area (ha) of each vegetation zone	4.4

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input checked="" type="checkbox"/> assessment of patch size (as described in BAM Subsection 4.3.2)	Table 4.6
		<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 4.6
		<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	
		<b>Maps and tables</b>	
		<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 3.5
		<input checked="" type="checkbox"/> Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	Figure 4.1
		<input checked="" type="checkbox"/> Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	Figure 4.2
		<input checked="" type="checkbox"/> Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCT boundaries	Figure D 1
		<input type="checkbox"/> Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	-
		<input 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)	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	–
		<input checked="" type="checkbox"/> composition condition score	Table 4.8
		<input checked="" type="checkbox"/> structure condition score	
		<input checked="" type="checkbox"/> function condition score	
		<input checked="" type="checkbox"/> presence of hollow bearing trees	
		<b>Data</b>	
		<input type="checkbox"/> All report maps as separate jpeg files	–
		<input type="checkbox"/> Plot field data (MS Excel format)	
		<input checked="" 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	<b>Information</b>	
		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 5.2.2)	Table 5.1
		<input checked="" type="checkbox"/> justification for addition of any ecosystem credit species to the list	Table 5.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		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
		<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
		<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
		<input checked="" type="checkbox"/> justification for addition of any species credit species to the list	Table 5.2
		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 and Table 5.5
		<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.))	
		<input checked="" type="checkbox"/> species for which targeted surveys are to be completed to determine species presence (BAM Subsection 5.2.4(2.b.))	
		<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 and 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)	2.3 and 2.4 Table 2.1
		<input 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	–



BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<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
		<input type="checkbox"/> survey personnel and relevant experience	
		<input type="checkbox"/> describe any limitations to surveys and how these were addressed/overcome	2.6
		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	–
		<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	Figures 5.1, 5.2, 5.3 and 5.4
		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, 5.2, 5.3, 5.4
		<input type="checkbox"/> a description of, and evidence-based justification for, the habitat constraints, features or	–

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		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 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
		<b>Maps and tables</b>	
		<input checked="" type="checkbox"/> Table showing ecosystem credit species in accordance with BAM Subsection 5.1.1, and identifying:	Table 5.1
		<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 and 5.3
		<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 and 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
		<input checked="" 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 5.7
		<input checked="" 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, 5.2, 5.3, 5.4
		<b>Data</b>	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<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	–
		<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	<b>Information</b>	
		Identify potential prescribed biodiversity impacts on threatened entities, including:	–
		<input type="checkbox"/> karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) <input 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)	Table 6.1 8.3
		<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 8.5
		<input 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	
		<input 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)	
		<b>Maps and tables</b>	
		<input type="checkbox"/> Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks,	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		human-made structures, etc.)	
		<input type="checkbox"/> Map showing location of potential vehicle strike locations	
		<b>Data</b>	
		<input type="checkbox"/> Digital shape files of prescribed impact feature locations	–
		<input type="checkbox"/> Prescribed impact features map in jpeg format	–
Avoid and minimise impacts	Chapter 7	<b>Information</b>	
		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 type="checkbox"/> modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology	
		<input checked="" type="checkbox"/> routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route	7.1.2
		<input checked="" type="checkbox"/> alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location	7.1 and 7.2
		<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 and 7.2
		<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)	7.1 and 7.2
		<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.))	7.1 and 7.2
		<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)	
		<b>Maps and tables</b>	
		<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	Table 7.1



BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<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	Figure 7.1
		<b>Data</b>	
		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	<b>Information</b>	
		<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
		Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):	Table 8.2
		<input checked="" type="checkbox"/> description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal	–
		<input checked="" type="checkbox"/> documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications	Table 8.3
		<input checked="" type="checkbox"/> reporting any limitations or assumptions, etc. made during the assessment	
		<input checked="" type="checkbox"/> identification of the threatened entities and their habitat likely to be affected	Table 8.1
		Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including:	Table 8.2
		assessment of the nature, extent frequency, duration and timing of impacts on the habitat of threatened species or ecological communities associated with:	Table 8.3
		<input type="checkbox"/> karst, caves, crevices, cliffs, rocks and other features of geological significance	Table 8.1

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<input type="checkbox"/> human-made structures	Table 8.2
		<input checked="" type="checkbox"/> non-native vegetation	–
		<input checked="" type="checkbox"/> connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range	–
		<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	
		<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	8.3.1
		<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	8.3.3
		<b>Maps and tables</b>	
		<input type="checkbox"/> Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts	Table 8.3
		<b>Data</b>	
		N/A	
Mitigation and management of impacts	Chapter 8, Sections 8.4 and 8.5	<b>Information</b>	
		Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including:	Table 8.2
		<input checked="" type="checkbox"/> techniques, timing, frequency and responsibility	
		<input type="checkbox"/> identify measures for which there is risk of failure	
		<input checked="" type="checkbox"/> evaluate the risk and consequence of any residual impacts	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<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)	
		<b>Maps and tables</b>	
		<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
		<b>Data</b>	
		N/A	–
Impact summary	Chapter 9	<b>Information</b>	
		Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAIL, 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 SAIL present on the subject land	
		<input type="checkbox"/> for each TEC, report the extent of the TEC in NSW	
		<input checked="" type="checkbox"/> addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAIL present on the subject land	9.1
		<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	

BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		<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	
		<b>Maps and tables</b>	
		<input type="checkbox"/> Map showing the extent of TECs at risk of an SAI within the subject land	
		<input type="checkbox"/> Map showing location of threatened species at risk of an SAI 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	
		<b>Data</b>	
		Digital shape files of:	–
		<input type="checkbox"/> extent of TECs at risk of an SAI within the subject land	–
		<input type="checkbox"/> location of threatened species at risk of an SAI within the subject land	–
		<input type="checkbox"/> boundary of impacts requiring offset	–
		<input type="checkbox"/> boundary of impacts not requiring offset	–
		<input type="checkbox"/> boundary of areas not requiring assessment	–
		<input type="checkbox"/> Maps in jpeg format	–
Impact summary	Chapter 10	<b>Information</b>	
		Ecosystem credits and species credits that measure the impact of the development on biodiversity values,	–



BDAR section	BAM ref.	BAM requirement	Page reference(s) in the BDAR
		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
		<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 10.1
		<b>Maps and tables</b>	
		<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 10.1
		<b>Data</b>	
		<input type="checkbox"/> Submitted proposal in the BAM Calculator	–
Biodiversity credit report	Chapter 10	<b>Information</b>	
		<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 E>
		<b>Maps and tables</b>	
		<input checked="" type="checkbox"/> Table of credit class and matching credit profile	Table 11.1 Table 11.2
		<b>Data</b>	
		<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		29/07/2024 7:52 AM
<b>1. Biodiversity Values (BV) Map - Results Summary (Biodiversity Conservation Regulation Section 7.3)</b>		
1.1	Does the development Footprint intersect with BV mapping?	no
1.2	Was <b>ALL</b> 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
<b>2. Area Clearing Threshold - Results Summary (Biodiversity Conservation Regulation Section 7.2)</b>		
2.1	Size of the development or clearing footprint	48,331.8 sqm
2.2	Native Vegetation Area Clearing Estimate (NVACE) (within development/clearing footprint)	14,876.4 sqm
2.3	Method for determining Minimum Lot Size	LEP
2.4	Minimum Lot Size (10,000sqm = 1ha)	400,000 sqm
2.5	Area Clearing Threshold (10,000sqm = 1ha)	10,000 sqm
2.6	Does the estimate exceed the Area Clearing Threshold? (NVACE results are an estimate and can be reviewed using the <a href="#">Guidance</a> )	yes
<b>REPORT RESULT: Is the Biodiversity Offset Scheme (BOS) Threshold exceeded for the proposed development footprint area?</b> (Your local council will determine if a BDAR is required)		<b>yes</b>

Page 1 of 4



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: \_\_\_\_\_

29/07/2024 07:52 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](mailto:map.review@environment.nsw.gov.au) or on 1800 001 490.



## Biodiversity Values Map



491.8 0 245.91 491.8 Metres

WGS\_1984\_Web\_Mercator\_Auxiliary\_Sphere

### Legend

- Biodiversity Values that have been mapped for more than 90 days
- Biodiversity Values added within last 90 days
- Native Vegetation Area Clearing Estimate (NVACE)
- Development area selected by proponent

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Imagery © Airbus DS/Spot Image 2016

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2019

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The results provided in this tool are generated using the best available mapping and knowledge of species habitat requirements.

This map is valid as at the date the report was generated. Checking the [Biodiversity Values Map viewer](#) for mapping updates is recommended.

## 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 subject land occurs within 5km of the Myall Lakes Wetlands. The proposal is unlikely to have any impact on this Ramsar site.

- listed threatened species and communities;

### Threatened Communities

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

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community
- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia
- Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions
- *Posidonia australis* seagrass meadows of the Manning-Hawkesbury ecoregion
- Subtropical and Temperate Coastal Saltmarsh
- Lowland Rainforest of Subtropical Australia
- Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland

Two nationally threatened ecological communities; Coastal Swamp Sclerophyll Forest of New South Wales and South-East Queensland, and Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland were identified within the western portion of the study area. Neither of these communities were located within the subject land. The subject land was located within proximity to the area of Coastal Swamp Sclerophyll Forest. As the proposal has the potential to impact this threatened community further assessment is required.

### Threatened Species

Sixty-five nationally threatened species were recorded on the DCCEEW database as occurring or having potential habitat available within 10km of the site (note all pelagic species and ocean-going birds which do not complete part of their life cycles on mainland NSW were excluded from the search), these being:

*Anthochaera phrygia*

*Numenius madagascariensis*

*Lathamus discolor*

*Calidris ferruginea*

*Limosa lapponica baueri*

*Melanodryas cucullata cucullata*

Regent Honeyeater

Eastern Curlew

Swift Parrot

Curlew Sandpiper

Nunivak Bar-tailed Godwit

South-eastern Hooded Robin

<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo
<i>Limosa limosa</i>	Black-tailed Godwit
<i>Botaurus poiciloptilus</i>	Australasian Bittern
<i>Erythrorhynchus radiatus</i>	Red Goshawk
<i>Rostratula australis</i>	Australian Painted Snipe
<i>Charadrius mongolus</i>	Lesser Sand Plover
<i>Tringa nebularia</i>	Common Greenshank
<i>Falco hypoleucos</i>	Grey Falcon
<i>Arenaria interpres</i>	Ruddy Turnstone
<i>Stagonopleura guttata</i>	Diamond Firetail
<i>Grantiella picta</i>	Painted Honeyeater
<i>Pachyptila turtur subantarctica</i>	Fairy Prion (southern)
<i>Hirundapus caudacutus</i>	White-throated Needle-tail
<i>Calyptorhynchus lathami lathami</i>	South-eastern Glossy Black-Cockatoo
<i>Gallinago hardwickii</i>	Latham's Snipe
<i>Calidris tenuirostris</i>	Great Knot
<i>Pluvialis squatarola</i>	Grey Plover
<i>Ardenna grisea</i>	Sooty Shearwater
<i>Neophema chrysostoma</i>	Blue-winged Parrot
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (south-eastern)
<i>Charadrius leschenaultii</i>	Greater Sand Plover
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper
<i>Xenus cinereus</i>	Terek Sandpiper
<i>Pycnoptilus floccosus</i>	Pilotbird
<i>Calidris canutus</i>	Red Knot
<i>Sternula nereis nereis</i>	Australian Fairy Tern
<i>Uperoleia mahonyi</i>	Mahony's Toadlet
<i>Mixophyes iteratus</i>	Giant Barred Frog
<i>Mixophyes balbus</i>	Stuttering Frog
<i>Litoria aurea</i>	Green and Golden Bell Frog
<i>Phascolarctos cinereus</i>	Koala (combined populations of
Queensland, New South Wales and the Australian Capital Territory)	
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll (southeastern
mainland population)	
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat
<i>Petauroides volans</i>	Greater Glider (southern and central)
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo (northern)
<i>Notamacropus parma</i>	Parma Wallaby
<i>Petaurus australis australis</i>	Yellow-bellied Glider (south-eastern)
<i>Pseudomys novaehollandiae</i>	New Holland Mouse
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox
<i>Euphrasia arguta</i>	
<i>Rhodamnia rubescens</i>	Scrub Turpentine
<i>Rhodomyrtus psidioides</i>	Native Guava
<i>Cynanchum elegans</i>	White-flowered Wax Plant
<i>Eriocaulon australasicum</i>	Austral Pipewort



<i>Rhizanthella slateri</i>	Eastern Underground Orchid
<i>Phaius australis</i>	Lesser Swamp-orchid
<i>Diuris praecox</i>	Newcastle Doubletail
<i>Angophora inopina</i>	Charmhaven Apple
<i>Arthraxon hispidus</i>	Hairy-joint Grass
<i>Asperula asthenes</i>	Trailing Woodruff
<i>Thesium australe</i>	Austral Toadflax
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly
<i>Persicaria elatior</i>	Knotweed
<i>Tetratheca juncea</i>	Black-eyed Susan
<i>Melaleuca biconvexa</i>	Biconvex Paperbark
<i>Eucalyptus parramattensis subsp. decadens</i>	Earp's Gum
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid
<i>Grevillea parviflora subsp. parviflora</i>	Small-flower Grevillea
<i>Prostanthera densa</i>	Villous Mintbush

#### 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 is contained in 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.

Three nationally threatened species were recorded within the study area, these species were:

- *Potorous tridactylus tridactylus* (Long-nosed Potoroo)
- *Phascolarctos cinereus* (Koala)
- *Pteropus poliocephalus* (Grey-headed Flying Fox)

As the proposal has the potential to impact these threatened species further assessment is required.



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

Scientific Name	Common Name	EPB C Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
<i>Euphrasia arguta</i>		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.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat or 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.	<b>Low</b>	Presence of species was not identified during surveys. No nearby records within the locality.	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.	<b>Low</b>	Presence of species was not identified during surveys. No nearby records within the locality.	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 level to about 600m ASL.	<b>Unlikely</b>	Presence of species was not identified during surveys. No nearby records within the locality.	No	No
<i>Eriocaulon australasicum</i>	Austral Pipewort	E	Three disjunct areas south-west Victoria, near Braidwood in NSW and in the Pilliga in NSW. Grows in shallow, seasonally-inundated depressions and swamp margins on clay plains.	<b>Unlikely</b>	Presence of species was not identified during surveys. No nearby records within the locality.	No	No
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	E	Occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan	<b>Low</b>	Presence of species was not identified during surveys. No	No	No

Scientific Name	Common Name	EPB C Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Grows in sclerophyll forest in shallow to deep loams.		nearby records within the locality.		
<i>Phaius australis</i>	Lesser Swamp-orchid	E	Occurs in Queensland and north-east NSW as far south as Coffs Harbour. Historically, it extended farther south, to Port Macquarie. Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas.	Unlikely	Presence of species was not identified during surveys. No nearby records within the locality.	No	No
<i>Diuris praecox</i>	Newcastle Doubletail	V	Known from between Bateau Bay and Smiths Lake. Large populations have been recorded within power line easements at Anna Bay, Bobs Farm and Adamstown Heights. Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey.	Low	Presence of species was not identified during surveys. No nearby records within close proximity to the subject land.	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 with a dense shrub understorey on deep white sandy soils over sandstone.	Low	Presence of species was not identified during surveys. No preferred habitat or 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.	Unlikely	Presence of species was not identified during surveys. No nearby records.	No	No

Scientific Name	Common Name	EPB C Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
<i>Asperula asthenes</i>	Trailing Woodruff	V	Occurs only in NSW. It is found in scattered locations from Bulahdelah north to near Kempsey, with several records from the Port Stephens/Wallis Lakes area/Forster (including Myall Lakes NP, New England NP, Wallingat NP and Darawnk NR). Occurs in damp sites, often along riverbanks.	<b>Unlikely</b>	Presence of species was not identified during surveys. No nearby records.	No	No
<i>Thesium australe</i>	Austral Toadflax	V	Grows in grassland or woodland, often in damp sites.	<b>Low</b>	Presence of species was not identified during surveys. No known 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.	<b>Low</b>	Presence of species was not identified during surveys.	No	No
<i>Persicaria elatior</i>	Knotweed	V	Recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertsocaleyin, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Tetradlea 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.	<b>Low</b>	Presence of species was not identified during surveys. No preferred vegetation associations were present.	No	No

Scientific Name	Common Name	EPB C Act Statu s	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
					No nearby records within the locality.		
<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.	<b>Unlikely</b>	Presence of species was not identified during surveys. No preferred habitat was present.	No	No
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Earp's 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'.	<b>Low</b>	Presence of species was not identified during surveys.	No	No
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	V	Grows in swamp-heath on sandy soils, chiefly in coastal districts, south from the Gibraltar Range. It is known historically from several localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra (although it is uncommon at all sites). Also recorded at Munmorah State Conservation Area, Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park and Ben Boyd National Park.	<b>Low</b>	Presence of species was not identified during targeted surveys.	No	No
<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	<b>Low</b>	Presence of species was not identified during surveys. No preferred vegetation	No	No



Scientific Name	Common Name	EPB C Act Status	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			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> .		associations were present.		
<i>Prostanthera densa</i>	Villous Mintbush	V	This species has been recorded from the Currarong area in Jervis Bay, Royal National Park (Marley), Cronulla, Helensburgh and Port Stephens (Nelson Bay). The Sydney and Royal National Park populations were thought possibly extinct, but the species is now known to occur at Bass and Flinders Point in Cronulla. Grows in sclerophyll forest and shrubland, on coastal headlands and near-coastal ranges, on sandstone.	Unlikely	Presence of species was not identified during surveys. No known vegetation assemblages were present.	No	No
<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.	Unlikely	Presence of species was not identified during surveys. No suitable habitat was present.	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 suitable habitat was present.	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 suitable habitat was present.	No	No
<i>Uperoleia mahonyi</i>	Mahony's Toadlet	E	Endemic to the mid-north coast of New South Wales (NSW) and to date has been found between Kangy	Low	Presence of species was not identified	No	No

Scientific Name	Common Name	EPB C Act Statu s	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			Angy and Seal Rocks. Inhabits ephemeral and semi-permanent swamps and swales on the coastal fringe of its range. Known records occur in heath or wallum habitats almost exclusively associated with leached (highly nutrient impoverished) white sand. Commonly associated with acid paperbark swamps, also occurs in wallum heath, swamp, mahogany-paperbark swamp forest, heath shrubland and Sydney red gum woodland. Recent studies suggest intact vegetation adjacent to and within water bodies is an important habitat feature for this species.		during surveys. Due to proximity to wetland habitat could potentially utilise drier areas of subject land.		
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	Temperate woodlands and open forest, including forest edges, preferring to forage on large-flowered Eucalypts.	<b>Low</b>	Presence of species was not identified during surveys. Seasonal foraging habitat was present.	No	No
<i>Numenius madagascariensis</i>	Eastern Curlew	CE & M	Estuaries, tidal mudflats, sandspits, saltmarshes, mangroves; occasionally fresh or brackish lakes.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Lathamus discolor</i>	Swift Parrot	CE	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.	<b>Low</b>	Presence of species was not identified during surveys. Seasonal foraging habitat was present.	No	No
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE & M	Tidal mudflats; saltmarsh; fresh, brackish or saline wetlands; sewage ponds.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Limosa lapponica</i>	Nunivak Bar-tailed	E	Most frequently recorded along major coastal river estuaries and sheltered embayments, particularly the	<b>Unlikely</b>	Presence of species was not identified	No	No

Scientific Name	Common Name	EPB C Act Statu s	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
<i>baueri</i>	Godwit		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.		during surveys. No suitable habitat was present.		
<i>Melanodryas cucullata cucullata</i>	South-eastern Hooded Robin	E	Eucalypt woodlands, Acacia scrublands, Banksia dominated coastal scrubs and open forests.	<b>Low</b>	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.	<b>Low</b>	Presence of species was not identified during surveys.	No	No
<i>Limosa limosa</i>	Black-tailed Godwit	E & M	Most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records 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.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	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.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	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	<b>Low</b>	Presence of species was not identified during surveys.	No	No

Scientific Name	Common Name	EPB C Act Statu s	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus Forest of coastal rivers.				
<i>Rostratula australis</i>	Australian Painted Snipe	E	Margins of swamps and streams, chiefly those covered with low and stunted vegetation	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Charadrius mongolus</i>	Lesser Sand Plover	E & M	In Australia the species is found around the entire coast but is most common in the Gulf of Carpentaria, and along the east coast of Queensland and northern NSW. 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.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Tringa nebularia</i>	Common Greenshank	E & M	Inhabits a wide variety of inland permanent and temporary wetlands and sheltered coastal habitats of varying salinity.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	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.	<b>Low</b>	Presence of species was not identified during surveys. Only marginal habitat was present.	No	No
<i>Arenaria interpres</i>	Ruddy Turnstone	V & M	Widespread within Australia during its non-breeding period of the year. Strongly prefers rocky shores or beaches where there are large deposits of rotting seaweed	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No



Scientific Name	Common Name	EPB C Act Statu s	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
<i>Stagonopleura guttata</i>	Diamond Firetail	V	Inhabits areas with a grassy, shrubby understorey including Eucalypt woodlands, forests, Acacia scrubs and mallee	<b>Low</b>	Presence of species was not identified during surveys. Only marginal habitat was present.	No	No
<i>Grantiella picta</i>	Painted Honeyeater	V	Nomadic, within a range of generally drier forested areas with mistletoes.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Pachyptila turtur subantarctica</i>	Fairy Prion (southern)	V	Is found offshore throughout oceans and coastal areas in the Southern Hemisphere. May move inshore during stormy weather.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Hirundapus caudacutus</i>	White-throated Needletail	V & M	Inhabits the airspace above forests, woodlands, farmlands, plains, lakes, coasts and towns.	<b>Moderate</b>	Presence of species was not identified during surveys. Due to the non-specific habitat requirements habitat was present within airspace above.	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.	<b>Low</b>	Presence of species was not identified during surveys. Marginal transitory habitat is present. A low number of smaller <i>Casuarina glauca</i> (Swamp Oak) and <i>Allocasuarina littoralis</i> (Black Sheoak) trees,	No	No

Scientific Name	Common Name	EPB C Act Statu s	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
					a suitable foraging species was present.		
<i>Gallinago hardwickii</i>	Latham's Snipe	V & M	Utilises a variety of habitat, such as soft wet ground or shallow water with tussock and other green and dead vegetation, and scrub or open wetland from sea-level to alpine bogs.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Calidris tenuirostris</i>	Great Knot	V & M	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 exposed reefs or rock platforms.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Pluvialis squatarola</i>	Grey Plover	V & M	Only occasionally recorded along the coast of NSW.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Ardenna grisea</i>	Sooty Shearwater	V & M	Breeds on islands off New South Wales.	<b>Unlikely</b>	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Neophema chrysostoma</i>	Blue-winged Parrot	V	Found in western NSW. They favour grasslands and grassy woodlands. They are often found near wetlands both near the coast and in semi-arid zones. Blue-winged Parrots can also be seen in altered environments such as airfields, golf-courses and paddocks.	<b>Low</b>	Presence of species was not identified during surveys. Only marginal habitat was present.	No	No
<i>Climacteris picumnus</i>	Brown	V	This species is a medium sized insectivorous bird that	<b>Low</b>	Presence of species	No	No

Scientific Name	Common Name	EPB C Act Statu s	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
<i>victoriae</i>	Treecreeper (south-eastern)		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.		was not identified during surveys. Only marginal habitat was present.		
<i>Charadrius leschenaultii</i>	Greater Sand Plover	V & M	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 species was not identified during surveys. No suitable habitat was present.	No	No
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	V & M	Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats.	Unlikely	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Xenus cinereus</i>	Terek Sandpiper	V & M	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 mudflats, lagoons, creeks and estuaries.	Unlikely	Presence of species was not identified during surveys. No suitable habitat was present.	No	No
<i>Pycnoptilus floccosus</i>	Pilotbird	V	Found in wet forested areas and heathland in eastern Victoria and south-eastern New South Wales	Low	Presence of species was not identified during surveys. Only marginal habitat was present.	No	No
<i>Calidris canutus</i>	Red Knot	V & M	In NSW it is recorded in small numbers along some of the major river estuaries and sheltered embayments of the coastline, in particular the Hunter River estuary. Mainly occurs in small numbers on intertidal mudflats, estuaries, bays, inlets, lagoons, harbours and sandflats and sandy beaches of sheltered coasts. It is	Low	Presence of species was not identified during surveys. Only marginal habitat was present.	No	No

Scientific Name	Common Name	EPB C Act Statu s	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			occasionally found on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms and is a rare visitor to terrestrial saline wetlands and freshwater swamps.				
<i>Sternula nereis nereis</i>	Australian Fairy Tern	V	The subspecies has been known from New South Wales (NSW) in the past, but it is unknown if it persists there. The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline.	<b>Low</b>	Presence of species was not identified during surveys. Only marginal habitat was present.	No	No
<i>Dasyurus maculatus</i> subsp. <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.	<b>Moderate</b>	Presence of species was not identified during surveys. Suitable habitat was present. Known local records on BioNet (NSW DCCEEW 2024e).	No	No
<i>Phascolarctos cinereus</i>	Koala	V	Coastal woodland and open forest containing suitable food trees.	<b>Known</b>	Previously recorded within the study area and subject land.	Yes	Yes
<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.	<b>Unlikely</b>	Presence of species was not identified during surveys. No known local records.	No	No
<i>Potorous tridactylus</i> sp. <i>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	<b>Known</b>	Presence of this species was not identified during surveys. Small	No	No



Scientific Name	Common Name	EPB C Act Statu s	Distribution and Habitat	Likelihood of occurrence	Justification	Impact Required	Assessment
			preferred by this species.		number of local records.		
<i>Petauroides volans</i>	Greater Glider	✓	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.	<b>Low</b>	Presence of species was not identified during surveys.	No	No
<i>Petaurus australis australis</i>	Yellow-bellied Glider (south-eastern)	✓	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.	<b>Low</b>	Presence of species was not identified during surveys.	No	No
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	✓	Known to inhabit open heathlands, open woodlands with a heathland understorey and vegetated sand dunes.	<b>Low-Moderate</b>	Presence of species was not identified during surveys.	No	No
<i>Pteropus poliocephalus</i>	Grey-headed Flying-Fox	✓	Wet and Dry Sclerophyll Forests, Rainforest, Mangroves and Paperbark swamps and Banksia Woodlands.	<b>Known</b>	Specimens identified foraging within the study area and subject land during surveys.	Yes	Yes
<i>Chalinolobus dwyeri</i>	Large Pied Bat	✓	Occupies dry sclerophyll forest and woodland. Roosts in caves, abandoned mud-nests of Fairy Martins and mine tunnels.	<b>Low</b>	Presence of species was not identified during surveys.	No	No

### **Swamp Sclerophyll Forest of New South Wales and South East Queensland**

#### **EPBC Assessment of Significance Under the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines for Critically endangered and endangered ecological communities**

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- *reduce the extent of an ecological community*

Plant Community Types PCT 4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest and PCT 4000 - Northern Estuarine Paperbark Sedge Forest occurring within the western portion of the study area were found to be consistent with that of the threatened Ecological Community - Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland. No areas of Swamp Sclerophyll Forest were present within the subject land, therefore will not be directly impacted. As a result of the close proximity of Swamp Sclerophyll Forest to the west of the subject land there is the potential of indirect impacts such as further weed incursion and other disturbances.

Taking into the consideration the recommendation of the legal protection of the surrounding habitat within the study area outside the subject land by such means as a positive covenant or Biodiversity Stewardship Agreement, a completed Vegetation Management Plan (VMP) (Wildthing Environmental Consultants, 2024) and additional mitigation measures in Section 8.0 the proposal is unlikely to reduce the extent of the Swamp Sclerophyll Forest Community contained within the study area

- *fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines*

No areas of Swamp Sclerophyll Forest will be fragmented.

- *adversely affect habitat critical to the survival of an ecological community*

The project is unlikely to adversely affect habitat considered to be critical to the survival of the community.

- *modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns*

The project is unlikely to affect any abiotic processes necessary for the community's survival.

- *cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting the following criteria:*

Given the recommendations the proposal is unlikely to result in substantial change in the species composition of this community locally.

- cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
  - assisting invasive species, that are harmful to the listed ecological community, to become established, or
    - causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or

Taking into consideration a completed Vegetation Management Plan (VMP) (Wildthing Environmental Consultants, 2024) and additional mitigation measures in Section 8.0 the proposal the proposal is unlikely to assist any invasive species, nor cause any increased mobilisation of fertilisers which would kill or inhibit the growth of species in the ecological community.

- *interfere with the recovery of an ecological community.*

The proposal is unlikely to interfere with any current recovery programs in the area.

### Conclusion

The project is unlikely to significantly impact this community therefore a referral is not likely to be required.

### **Potorous tridactylus tridactylus (Long-nosed Potoroo)**

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

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

One individual specimen of *Potorous tridactylus tridactylus* (Long-nosed Potoroo) was recorded within the study area during the terrestrial camera trapping survey on 14 August 2019. The camera was located within Swamp Sclerophyll Forest approximately 80m to the west of the subject land in the south. According to BioNet (NSW DCCEEW, 2024a) the Long-nosed Potoroo has also previously been recorded approximately 750m to the north-west of the subject land. Suitable habitat has been escribed as vegetation with a dense shrub layer or alternatively high canopy cover exceeding 70% (NSW DCCEEW 2024a). The proposal will result in the removal of 1.06ha of suitable habitat under this definition for this species in the form of PCT 3544 - Coastal Sands Apple-Blackbutt Forest. An additional 0.54ha of vegetation that occurs adjacent to the suitable habitat would be considered marginal habitat as a result of the absence an understorey. Given the proximity of large areas of similar habitat outside the subject land within the study area and surrounding Hawks Nest North area and taking into the considerations the mitigation measures given in Section 8.0 the proposal is unlikely to lead to a long-term decrease in the size of an important population of this species.

- reduce the area of occupancy of the species

The proposal will result in a reduction of up to 1.06ha of suitable habitat for the Long-nosed Potoroo. An additional 0.54ha of vegetation that occurs adjacent to the suitable habitat would be considered marginal habitat as a result of the absence an understorey. 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.

- fragment an existing population into two or more populations

The proposal is not likely to result in the fragmentation of an existing population of Long-nosed Potoroos. The implementation of a 50m east-west habitat corridor in the far north of the subject land over the open area would likely enhance the connection between the two forested areas either side for Long-nosed Potoroos.

- adversely affect habitat critical to the survival of a species

As a result of the relatively small removal of habitat and presence of larger areas of similar habitat within proximity to the subject land and taking into the mitigation measures in Section 8.0 the proposal is unlikely to adversely affect habitat critical to the survival of a species.

- disrupt the breeding cycle of a population

As a result of the relatively small removal of suitable habitat and presence of larger areas of similar habitat within proximity to the subject land and taking into the mitigation measures in Section 8.0 the proposal is unlikely to disrupt the breeding cycle of a population.

- 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 1.60ha of suitable and marginal habitat, however taking into considering the large amount of similar habitat within proximity to the subject land and taking into the mitigation measures in Section 8.0 no significant areas are to be modified, destroyed, removed, isolated or decreased to the extent that the species is likely to decline.

- 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.

- 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.

- interfere with the recovery of the species.

Conservation Advice for the Long-nosed Potoroo (DAWE, 2022) relevant to the proposal includes:

- Avoid further loss and fragmentation of habitat, including loss of vegetation connecting areas of habitat for the species or the creation or increase of barriers to movement between subpopulations;
- Where feasible, promote the restoration and enhancement of habitat connectivity between fragmented habitat patches to allow safe movement of individuals.
- Outside of National Parks and other managed conservation areas, promote the conservation and management of the species' habitat through the establishment of voluntary conservation



agreements, Council open space habitat areas and covenanted areas *Potorous tridactylus tridactylus* (northern long-nosed potoroo).

- Ensure that a high proportion of the northern long-nosed potoroo habitat is maintained in a long unburnt condition (>20 years).
- Develop and implement strategies to control predation by the European red fox and feral cats and where relevant, competition from feral pigs, as detailed in the relevant Threat Abatement Plans (TAPs) or management strategies. Develop and implement strategies to manage weeds where they are impacting the species, consistent with the Australian Weeds Strategy 2017-2027 (Invasive Plants and Animals Committee 2016) and other relevant management strategies. Develop appropriate prioritisation of which weed species to control based on those which specifically affect the northern long-nosed potoroo.
- Promote the registration and responsible management of domestic cats and dogs, targeting urban areas adjacent to known the northern long-nosed potoroo populations. Consider cat containment and prohibition options for suburbs next to important populations of the northern long-nosed potoroo.

Taking into the consideration the recommendation of the legal protection of the surrounding habitat within the study area by way of a positive covenant or a Biodiversity Stewardship Agreement, the completion of a Vegetation Management Plan for the study area, the implementation of a 50m wide habitat corridor in the far north of the subject land and controls on domestic cats and dogs the proposal is unlikely to interfere with the recovery of the Long-nosed Potoroo.

#### Conclusion

Considering the above factors, the proposal is unlikely to have a significant impact on the Long-nosed Potoroo, therefore referral would not likely be required.

#### **Pteropus poliocephalus (Grey-headed Flying Fox)**

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

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

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

Numerous specimens of *Pteropus poliocephalus* (Grey-headed Flying-Fox) were observed to be foraging on flowering specimens of *Eucalyptus robusta* (Swamp Mahogany) within the study area to the west of the subject land during spotlighting in May 2019 and June 2024. These Grey-headed Flying-Foxes were likely originating from the seasonal camp near the Ibis Avenue and Kingfisher Avenue intersection at Hawks Nest approximately 1.5km to the south of the subject land (MidCoast Council, 2021). The subject land contains suitable foraging habitat in the form of flowering myrtaceous and proteaceous trees particularly *Eucalyptus pilularis* (Blackbutt), *Corymbia gummifera* (Red Bloodwood) *Angophora costata* (Smooth-barked Apple) and *Banksia serrata* (Old Man Banksia). No maternity or other roosting camps of Grey-headed Flying-Foxes were observed within the study area or in close proximity. . The proposal will result in the removal of up to 1.60ha of foraging habitat 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.

- reduce the area of occupancy of the species

The proposal will result in a reduction of up to 1.60ha 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.

- 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 1.60ha of foraging habitat is unlikely to fragment an existing population into two or more populations.

- 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.

- 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.

- 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 1.60ha of foraging habitat, however taking into considering the large amount of similar habitat within proximity to the subject land 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.

- 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.

- 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.

- 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.

**Phascolarctos cinereus (Koala)**

Acoustic songmeter surveys conducted within the study area in 2022 by Eco Logical Australia (Eco Logical Australia, 2023) recorded calls of *Phascolarctos cinereus* (Koala). No evidence of Koala Activity was recorded within the study area during fieldwork which included spotlighting and Koala Spot Assessments (Appendix G). According to BioNet (NSW DCCEE, 2024a) the Koala has been previously recorded within the study area on three occasions; within 2022 (the Eco Logical Australia) survey and earlier in 2004 and 2003. There were also a number of koala sightings recorded within proximity to the study area.

The study area is located within the North Coast NSW Koala Management Bioregion. Locally important koala trees present within the study area include *Eucalyptus robusta* (Swamp Mahogany) and *Eucalyptus microcorys* (Tallowwood) (Youngentob, Marsh and Skewes 2021). Very few specimens of these two feed tree species were present within the eastern portion of the study area containing the subject land (development footprint).

Studies completed for the Draft Koala Plan of Management for North Hawks Nest (KPoM) (Biolink, 2005) have mapped an area containing 14 specimens of *E. microcorys* to the east of the subject land as High and Medium Use Core Koala Habitat. This area of Core Koala Habitat also extended further east outside the study area over Mungo Brush Road where specimens of *E. microcorys* were also present. According to the Draft KPoM areas containing Tallowwood even if under 15% of tree species present would be regarded as Potential Koala Habitat. As Koalas were recorded within this area during studies conducted in 2004 areas containing Tallowwood would be considered to constitute Core Koala Habitat. Given the numbers of the feed tree species *E. robusta* within Swamp Sclerophyll Forest the study area to the west of the subject land this area would also be considered to be Core Koala Habitat.

Given the presence of the Koala within the subject land, Core Koala Habitat therefore includes all areas mapped as PCT3544 Good Condition and PCT3544 Moderate condition. As Core Koala habitat was considered to be present within the study area and subject land an Individual Koala Plan of Management has been prepared (Wildthing Environmental Consultants, 2024b).

If a proposal is likely to impact the koala and/or its habitat, it needs to be referred to the department for assessment. Types of actions that involve clearing of koala habitat but which do not generally need to be referred include:

- An action that has been granted an EPBC Act exemption. An exemption may be granted on the grounds that the action is being undertaken to preserve human life, property or prevent these risks. For example, clearing land for fire emergencies. See Bushfire and national environmental law guide.
- Clearing of habitat to reduce the risk of bushfire outside of emergency situations. This is where the impact is not likely to have a significant impact on a matter of national environmental significance. See Bushfire and national environmental law guide.
- Clearing of individual or small groups (fewer than 10) of paddock trees. This is provided that these are not the only dispersal link between patches of habitat. See Paddock trees guide.
- Certain agricultural activities. See Agricultural exemptions guide.
- Other minister issued exemptions. See Public register.
- Under the EPBC Act, an action does not need approval if it is taken in accordance with a Regional Forest Agreement.

None of the above exemptions apply to this proposal. In order to consider if the proposal is likely to impact the koala and/or its habitat, consideration was given under the EPBC Assessment of Significance Under the EPBC Act Policy Statement 1.1 – Significant Impact Guidelines for Critically

endangered and endangered species. Koala habitat was identified within the study area and avoidance and minimisation of impacts were explored.

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

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

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

Acoustic songmeter surveys conducted within the study area in 2022 by Eco Logical Australia (Eco Logical Australia, 2023) recorded the Koala within the study area. No evidence of Koala Activity was recorded within the study area during fieldwork which included spotlighting and Koala Spot Assessments (Appendix G). According to BioNet (NSW DCCEEW, 2024a) the Koala has been previously recorded within the study area and within proximity on a number of occasions.

Taking into the consideration the recommendation of the legal protection of the habitat within the study area outside the subject land by way of a positive covenant or a Biodiversity Stewardship Agreement, the completion of Koala Plan of Management (KPoM) (Wildthing Environmental Consultants, 2024b) and Vegetation Management Plan (Wildthing Environmental Consultants, 2024a) for the proposal together with the implementation of a 50m wide habitat corridor in the far north of the subject land the proposal is unlikely to interfere with the recovery of the Koala.

- reduce the area of occupancy of the species

The proposal will result in a reduction of up to 1.60ha of habitat for the Koala, containing three (3) specimens of the preferred feed tree, *Eucalyptus robusta* (Swamp Mahogany). Considering the proposed 50m corridor in the far north of the subject land which will be planted with preferred koala feed tree species and the presence of a 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.

- fragment an existing population into two or more populations

The proposal is not likely to result in the fragmentation of an existing population of Koalas. The implementation of a 50m east-west habitat corridor composed of koala feed tree species in the far north of the subject land over an existing open area would likely enhance the connection between the two forested areas either side for Koalas.

- adversely affect habitat critical to the survival of a species

Taking into the consideration the recommendation of the legal protection of the habitat within the study area outside the subject land by way of a positive covenant or a Biodiversity Stewardship Agreement, the completion of Koala Plan of Management (KPoM) (Wildthing Environmental Consultants, 2024b) and Vegetation Management Plan (Wildthing Environmental Consultants, 2024a) for the proposal together with the implementation of a 50m wide habitat corridor in the far north of the subject land the proposal is unlikely to adversely affect habitat critical to the survival of a species



- disrupt the breeding cycle of a population

Taking into the consideration the recommendation of the legal protection of the habitat within the study area outside the subject land by way of a positive covenant or a Biodiversity Stewardship Agreement, the completion of Koala Plan of Management (KPoM) (Wildthing Environmental Consultants, 2024b) and Vegetation Management Plan (Wildthing Environmental Consultants, 2024a) for the proposal together with the implementation of a 50m wide habitat corridor in the far north of the subject land the proposal is unlikely to disrupt the breeding cycle of a population.

- 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 1.60ha of habitat including three preferred feed trees. Taking into the consideration the recommendation of the legal protection of the habitat within the study area outside the subject land by way of a positive covenant or a Biodiversity Stewardship Agreement, the completion of Koala Plan of Management (KPoM) (Wildthing Environmental Consultants, 2024b) and Vegetation Management Plan (Wildthing Environmental Consultants, 2024a) for the proposal together with the implementation of a 50m wide habitat corridor in the far north of the subject land the proposal is unlikely to disrupt the breeding cycle of a population.

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

Taking into the consideration completion of a Koala Plan of Management (KPoM) (Wildthing Environmental Consultants, 2024b) and Vegetation Management Plan (Wildthing Environmental Consultants, 2024a) for the proposal together with the implementation of a 50m wide habitat corridor in the far north of the subject land the proposal is unlikely to result in invasive species that are harmful to Koalas.

- 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.

- interfere with the recovery of the species.

Taking into the consideration the recommendation of the legal protection of the habitat within the study area outside the subject land by way of a positive covenant or a Biodiversity Stewardship Agreement, the completion of Koala Plan of Management (KPoM) (Wildthing Environmental Consultants, 2024b) and Vegetation Management Plan (Wildthing Environmental Consultants, 2024a) for the proposal together with the implementation of a 50m wide habitat corridor in the far north of the subject land the proposal is unlikely to interfere with the recovery of the species.

### Conclusion

Considering the above factors, the proposal is unlikely to have a significant impact on the Koala therefore referral would not likely be required.

- migratory species protected under international agreements;

Fifty-nine 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 Species:

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

Migratory Wetland Species:

- |                                    |                        |
|------------------------------------|------------------------|
| • <i>Calidris ruficollis</i>       | Red-necked Stint       |
| • <i>Charadrius bicinctus</i>      | Double-banded Plover   |
| • <i>Arenaria interpres</i>        | Ruddy Turnstone        |
| • <i>Pluvialis fulva</i>           | Pacific Golden Plover  |
| • <i>Numenius phaeopus</i>         | Whimbrel               |
| • <i>Limosa limosa</i>             | Black-tailed Godwit    |
| • <i>Gallinago hardwickii</i>      | Latham's Snipe         |
| • <i>Numenius madagascariensis</i> | Eastern Curlew         |
| • <i>Calidris tenuirostris</i>     | Great Knot             |
| • <i>Pluvialis squatarola</i>      | Grey Plover            |
| • <i>Gallinago megala</i>          | Swinhoe's Snipe        |
| • <i>Limosa lapponica</i>          | Bar-tailed Godwit      |
| • <i>Thalasseus bergii</i>         | Greater Crested Tern   |
| • <i>Gallinago stenura</i>         | Pin-tailed Snipe       |
| • <i>Charadrius mongolus</i>       | Lesser Sand Plover     |
| • <i>Tringa nebularia</i>          | Common Greenshank      |
| • <i>Charadrius leschenaultii</i>  | Greater Sand Plover,   |
| • <i>Calidris acuminata</i>        | Sharp-tailed Sandpiper |
| • <i>Actitis hypoleucos</i>        | Common Sandpiper       |
| • <i>Pandion haliaetus</i>         | Osprey                 |
| • <i>Tringa stagnatilis</i>        | Marsh Sandpiper,       |
| • <i>Xenus cinereus</i>            | Terek Sandpiper        |
| • <i>Numenius minutus</i>          | Little Curlew,         |
| • <i>Tringa brevipes</i>           | Grey-tailed Tattler    |
| • <i>Calidris melanotos</i>        | Pectoral Sandpiper     |
| • <i>Calidris ferruginea</i>       | Curlew Sandpiper       |
| • <i>Calidris canutus</i>          | Red Knot               |

Migratory Marine Birds

- |                                   |                         |
|-----------------------------------|-------------------------|
| • <i>Anous stolidus</i>           | Common Noddy            |
| • <i>Thalassarche melanophris</i> | Black-browed Albatross  |
| • <i>Macronectes halli</i>        | Northern Giant Petrel   |
| • <i>Macronectes giganteus</i>    | Southern Giant-Petrel   |
| • <i>Thalassarche salvini</i>     | Salvin's Albatross      |
| • <i>Thalassarche bulleri</i>     | Buller's Albatross      |
| • <i>Ardeana tenuirostris</i>     | Short-tailed Shearwater |
| • <i>Sternula albifrons</i>       | Little Tern             |
| • <i>Calonectris leucomelas</i>   | Streaked Shearwater     |
| • <i>Phoebastria fusca</i>        | Sooty Albatross         |

- |                                |                               |
|--------------------------------|-------------------------------|
| • <i>Apus pacificus</i>        | Fork-tailed Swift             |
| • <i>Diomedea antipodensis</i> | Antipodean Albatross          |
| • <i>Thalassarche impavida</i> | Campbell Albatross,           |
| • <i>Diomedea sanfordi</i>     | Northern Royal Albatross      |
| • <i>Thalassarche eremita</i>  | Chatham Albatross             |
| • <i>Ardena pacifica</i>       | Wedge-tailed Shearwater       |
| • <i>Thalassarche cauta</i>    | Shy Albatross                 |
| • <i>Ardena grisea</i>         | Sooty Shearwater              |
| • <i>Diomedea exulans</i>      | Wandering Albatross           |
| • <i>Diomedea epomophora</i>   | Southern Royal Albatross      |
| • <i>Fregata ariel</i>         | Lesser Frigatebird            |
| • <i>Phaethon lepturus</i>     | White-tailed Tropicbird       |
| • <i>Thalassarche carteri</i>  | Indian Yellow-nosed Albatross |
| • <i>Fregata minor</i>         | Great Frigatebird             |
| • <i>Thalassarche steadi</i>   | White-capped Albatross        |
| • <i>Ardena carneipes</i>      | Flesh-footed Shearwater       |

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.



Australian Government

Department of Climate Change, Energy,  
the Environment and Water

## 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: 29-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](#).

<a href="#">World Heritage Properties:</a>	None
<a href="#">National Heritage Places:</a>	None
<a href="#">Wetlands of International Importance (Ramsar):</a>	1
<a href="#">Great Barrier Reef Marine Park:</a>	None
<a href="#">Commonwealth Marine Area:</a>	None
<a href="#">Listed Threatened Ecological Communities:</a>	7
<a href="#">Listed Threatened Species:</a>	103
<a href="#">Listed Migratory Species:</a>	79

### 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.

<a href="#">Commonwealth Lands:</a>	10
<a href="#">Commonwealth Heritage Places:</a>	None
<a href="#">Listed Marine Species:</a>	106
<a href="#">Whales and Other Cetaceans:</a>	14
<a href="#">Critical Habitats:</a>	None
<a href="#">Commonwealth Reserves Terrestrial:</a>	None
<a href="#">Australian Marine Parks:</a>	None
<a href="#">Habitat Critical to the Survival of Marine Turtles:</a>	None

### Extra Information

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

<a href="#">State and Territory Reserves:</a>	8
<a href="#">Regional Forest Agreements:</a>	1
<a href="#">Nationally Important Wetlands:</a>	2
<a href="#">EPBC Act Referrals:</a>	11
<a href="#">Key Ecological Features (Marine):</a>	None
<a href="#">Biologically Important Areas:</a>	11
<a href="#">Bioregional Assessments:</a>	None
<a href="#">Geological and Bioregional Assessments:</a>	None

## Details

### Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[ Resource Information ]
Ramsar Site Name	Proximity	Buffer Status
<a href="#">Myall lakes</a>	Within Ramsar site	In feature area

### Listed Threatened Ecological Communities [ Resource Information ]

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

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community</a>	Endangered	Community likely to occur within area	In feature area
<a href="#">Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland</a>	Endangered	Community likely to occur within area	In feature area
<a href="#">Littoral Rainforest and Coastal Vine Thickets of Eastern Australia</a>	Critically Endangered	Community likely to occur within area	In buffer area only
<a href="#">Lowland Rainforest of Subtropical Australia</a>	Critically Endangered	Community likely to occur within area	In feature area
<a href="#">Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion</a>	Endangered	Community likely to occur within area	In buffer area only
<a href="#">Subtropical and Temperate Coastal Saltmarsh</a>	Vulnerable	Community likely to occur within area	In feature area
<a href="#">Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions</a>	Endangered	Community likely to occur within area	In feature area

### Listed Threatened Species [ Resource Information ]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Anthochaera phrygia</u></a> Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Ardenna grisea</u></a> Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area	In feature area
<a href="#"><u>Arenaria interpres</u></a> Ruddy Turnstone [872]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Botaurus poiciloptilus</u></a> Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Calidris acuminata</u></a> Sharp-tailed Sandpiper [874]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Calidris canutus</u></a> Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Calidris ferruginea</u></a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Calidris tenuirostris</u></a> Great Knot [862]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Callocephalon fimbriatum</u></a> Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Calyptrorhynchus lathami lathami</u></a> South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Charadrius leschenaultii</u></a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Charadrius mongolus</u></a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Climacteris picumnus victoriae</u></a> Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Diomedea antipodensis</u></a> Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea antipodensis gibsoni</u></a> Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea epomophora</u></a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea exulans</u></a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea sanfordi</u></a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Erythrotriorchis radiatus</u></a> Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Falco hypoleucos</u></a> Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Fregetta grallaria grallaria</u></a> White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Gallinago hardwickii</u></a> Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Grantiella picta</u></a> Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Hirundapus caudacutus</u></a> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Lathamus discolor</u></a> Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Limosa lapponica baueri</u></a> Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Limosa limosa</u></a> Black-tailed Godwit [845]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Macronectes giganteus</u></a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Macronectes halli</u></a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Melanodryas cucullata cucullata</u></a> South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Neophema chrysostoma</u></a> Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Numenius madagascariensis</u></a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Pachyptila turtur subantarctica</u></a> Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Phoebastria fusca</u></a> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#"><u>Pluvialis squatarola</u></a> Grey Plover [865]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Pterodroma leucoptera leucoptera</u></a> Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Breeding known to occur within area	In buffer area only
<a href="#"><u>Pterodroma neglecta neglecta</u></a> Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
<a href="#"><u>Pycnoptilus floccosus</u></a> Pilotbird [525]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Rostratula australis</u></a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Stagonopleura guttata</u></a> Diamond Firetail [59398]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Sternula nereis nereis</u></a> Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Thalassarche bulleri</u></a> Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Thalassarche bulleri platei</u></a> Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Thalassarche carteri</u></a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Thalassarche cauta</u></a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Thalassarche eremita</u></a> Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
<a href="#"><u>Thalassarche impavida</u></a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Thalassarche melanophris</u></a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Thalassarche salvini</u></a> Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Thalassarche steadi</u></a> White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Tringa nebularia</u></a> Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Xenus cinereus</u></a> Terek Sandpiper [59300]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<b>FISH</b>			
<a href="#"><u>Epinephelus daemeli</u></a> Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Hippocampus whitei</u></a> White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Seriotelella brama</u></a> Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
<b>FROG</b>			
<a href="#"><u>Litoria aurea</u></a> Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Mixophyes balbus</u></a> Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#"><u>Mixophyes iteratus</u></a> Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#"><u>Uperoleia mahonyi</u></a> Mahony's Toadlet [89189]	Endangered	Species or species habitat known to occur within area	In feature area
<b>MAMMAL</b>			
<a href="#"><u>Balaenoptera borealis</u></a> Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#"><u>Balaenoptera musculus</u></a> Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Balaenoptera physalus</u></a> Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#"><u>Chalinolobus dwyeri</u></a> 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
<a href="#"><u>Dasyurus maculatus maculatus (SE mainland population)</u></a> 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
<a href="#"><u>Eubalaena australis</u></a> Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Notamacropus parma</u></a> Parma Wallaby [89289]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Petauroides volans</u></a> Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Petaurus australis australis</u></a> Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)</u></a> 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
<a href="#"><u>Potorous tridactylus tridactylus</u></a> Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Pseudomys novaehollandiae</u></a> New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Pteropus poliocephalus</u></a> Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<b>OTHER</b>			
<a href="#"><u>Dendronephthya australis</u></a> Cauliflower Soft Coral [90325]	Endangered	Species or species habitat known to occur within area	In buffer area only
<b>PLANT</b>			

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Angophora inopina</u></a> Charmhaven Apple [64832]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Arthraxon hispidus</u></a> Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
<a href="#"><u>Asperula asthenes</u></a> Trailing Woodruff [14004]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Cryptostylis hunteriana</u></a> Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Cynanchum elegans</u></a> White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Diuris praecox</u></a> Newcastle Doubletail [55086]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Eriocaulon australasicum</u></a> Austral Pipewort, Southern Pipewort [7649]	Endangered	Species or species habitat may occur within area	In buffer area only
<a href="#"><u>Eucalyptus parramattensis subsp. decadens</u></a> Earp's Gum, Earp's Dirty Gum [56148]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Euphrasia arguta</u></a> [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Grevillea parviflora subsp. parviflora</u></a> Small-flower Grevillea [64910]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#"><u>Melaleuca biconvexa</u></a> Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Persicaria elatior</u></a> Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#"><u>Phaius australis</u></a> Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Prostanthera densa</u></a> Villous Mintbush [12233]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
<a href="#"><u>Rhizanthella slateri</u></a> Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Rhodamnia rubescens</u></a> Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Rhodomyrtus psidioides</u></a> Native Guava [19162]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Syzygium paniculatum</u></a> 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
<a href="#"><u>Tetralthea juncea</u></a> Black-eyed Susan [21407]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Thesium australe</u></a> Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
<b>REPTILE</b>			
<a href="#"><u>Caretta caretta</u></a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Chelonia mydas</u></a> Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Dermochelys coriacea</u></a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Eretmochelys imbricata</u></a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Natator depressus</u></a> Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

#### SHARK

<a href="#"><u>Carcharias taurus (east coast population)</u></a> Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area	In feature area
<a href="#"><u>Carcharodon carcharias</u></a> White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area	In feature area
<a href="#"><u>Galeorhinus galeus</u></a> School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
<a href="#"><u>Rhincodon typus</u></a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Sphyrna lewini</u></a> Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species	[ Resource Information ]		
Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>Migratory Marine Birds</b>			
<a href="#"><u>Anous stolidus</u></a> Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Apus pacificus</u></a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Ardenna carneipes</u></a> Flesh-footed Shearwater, Fleishy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Ardenna grisea</u></a> Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area	In feature area
<a href="#"><u>Ardenna pacifica</u></a> Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
<a href="#"><u>Ardenna tenuirostris</u></a> Short-tailed Shearwater [82652]		Breeding known to occur within area	In buffer area only
<a href="#"><u>Calonectris leucomelas</u></a> Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Diomedea antipodensis</u></a> Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea epomophora</u></a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea exulans</u></a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea sanfordi</u></a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Fregata ariel</u></a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Fregata minor</u></a> Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Macronectes giganteus</u></a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Macronectes halli</u></a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Phaethon lepturus</u></a> White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Phoebastria fusca</u></a> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#"><u>Sternula albifrons</u></a> Little Tern [82849]		Breeding likely to occur within area	In feature area
<a href="#"><u>Thalassarche bulleri</u></a> Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Thalassarche carteri</u></a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Thalassarche cauta</u></a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Thalassarche eremita</u></a> Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
<a href="#"><u>Thalassarche impavida</u></a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Thalassarche melanophrys</u></a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><i>Thalassarche salvini</i></a> Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><i>Thalassarche steadi</i></a> White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
<b>Migratory Marine Species</b>			
<a href="#"><i>Balaenoptera borealis</i></a> Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#"><i>Balaenoptera edeni</i></a> Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
<a href="#"><i>Balaenoptera musculus</i></a> Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><i>Balaenoptera physalus</i></a> Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#"><i>Caperea marginata</i></a> Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area
<a href="#"><i>Carcharhinus longimanus</i></a> Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area
<a href="#"><i>Carcharodon carcharias</i></a> White Shark, Great White Shark [64470]	Vulnerable	Breeding known to occur within area	In feature area
<a href="#"><i>Caretta caretta</i></a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Chelonia mydas</u></a> Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Dermochelys coriacea</u></a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Dugong dugon</u></a> Dugong [28]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Eretmochelys imbricata</u></a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Eubalaena australis</u></a> as <a href="#"><u>Balaena glacialis australis</u></a> Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Lamna nasus</u></a> Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Megaptera novaeangliae</u></a> Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Mobula alfredi</u></a> as <a href="#"><u>Manta alfredi</u></a> Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Mobula birostris</u></a> as <a href="#"><u>Manta birostris</u></a> Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Natator depressus</u></a> Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Orcinus orca</u></a> Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Rhincodon typus</u></a> Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
<b>Migratory Terrestrial Species</b>			
<a href="#"><u>Cuculus optatus</u></a> Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Hirundapus caudacutus</u></a> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Monarcha melanopsis</u></a> Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Myiagra cyanoleuca</u></a> Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Rhipidura rufifrons</u></a> Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Symposiachrus trivirgatus</u></a> as <a href="#"><u>Monarcha trivirgatus</u></a> Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
<b>Migratory Wetlands Species</b>			
<a href="#"><u>Actitis hypoleucos</u></a> Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Arenaria interpres</u></a> Ruddy Turnstone [872]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Calidris acuminata</u></a> Sharp-tailed Sandpiper [874]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><i>Calidris canutus</i></a> Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><i>Calidris ferruginea</i></a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><i>Calidris melanotos</i></a> Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
<a href="#"><i>Calidris ruficollis</i></a> Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><i>Calidris tenuirostris</i></a> Great Knot [862]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><i>Charadrius bicinctus</i></a> Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><i>Charadrius leschenaultii</i></a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><i>Charadrius mongolus</i></a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><i>Gallinago hardwickii</i></a> Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#"><i>Gallinago megala</i></a> Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Gallinago stenura</u></a> Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Limosa lapponica</u></a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Limosa limosa</u></a> Black-tailed Godwit [845]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Numenius madagascariensis</u></a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Numenius minutus</u></a> Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Numenius phaeopus</u></a> Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Pandion haliaetus</u></a> Osprey [952]		Breeding known to occur within area	In feature area
<a href="#"><u>Pluvialis fulva</u></a> Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Pluvialis squatarola</u></a> Grey Plover [865]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Thalasseus bergii</u></a> Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><i>Tringa brevipes</i></a> Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><i>Tringa nebularia</i></a> Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><i>Tringa stagnatilis</i></a> Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><i>Xenus cinereus</i></a> Terek Sandpiper [59300]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

#### 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
<b>Communications, Information Technology and the Arts - Telstra Corporation Limited</b>		
Commonwealth Land - Australian Telecommunications Commission [11387]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [16445]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11394]	NSW	In buffer area only
<b>Defence - Defence Housing Authority</b>		
Commonwealth Land - Defence Housing Authority [16121]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16119]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16120]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16495]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16477]	NSW	In buffer area only
<b>Unknown</b>		
Commonwealth Land - [15082]	NSW	In buffer area only



Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [11388]	NSW	In buffer area only

Listed Marine Species			[ Resource Information ]
Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>Bird</b>			
<a href="#"><u>Actitis hypoleucos</u></a> Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Anous stolidus</u></a> Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Apus pacificus</u></a> Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#"><u>Ardenna carneipes as Puffinus carneipes</u></a> Flesh-footed Shearwater, Flesh-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Ardenna grisea as Puffinus griseus</u></a> Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area	In feature area
<a href="#"><u>Ardenna pacifica as Puffinus pacificus</u></a> Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
<a href="#"><u>Ardenna tenuirostris as Puffinus tenuirostris</u></a> Short-tailed Shearwater [82652]		Breeding known to occur within area	In buffer area only
<a href="#"><u>Arenaria interpres</u></a> Ruddy Turnstone [872]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Bubulcus ibis as Ardea ibis</u></a> Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Calidris acuminata</u></a> Sharp-tailed Sandpiper [874]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Calidris canutus</u></a> Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#"><u>Calidris ferruginea</u></a> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#"><u>Calidris melanotos</u></a> Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#"><u>Calidris ruficollis</u></a> Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
<a href="#"><u>Calidris tenuirostris</u></a> Great Knot [862]	Vulnerable	Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
<a href="#"><u>Calonectris leucomelas</u></a> Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Charadrius bicinctus</u></a> Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
<a href="#"><u>Charadrius leschenaultii</u></a> Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Charadrius mongolus</u></a> Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Charadrius ruficapillus</u></a> Red-capped Plover [881]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
<a href="#"><u>Chroicocephalus novaehollandiae</u></a> as <a href="#"><u>Larus novaehollandiae</u></a> Silver Gull [82326]		Breeding known to occur within area	In buffer area only
<a href="#"><u>Diomedea antipodensis</u></a> Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea antipodensis gibsoni</u></a> as <a href="#"><u>Diomedea gibsoni</u></a> Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea epomophora</u></a> Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea exulans</u></a> Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Diomedea sanfordi</u></a> Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Eudyptula minor</u></a> Little Penguin [1085]		Breeding known to occur within area	In buffer area only
<a href="#"><u>Fregata ariel</u></a> Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Fregata minor</u></a> Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Gallinago hardwickii</u></a> Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#"><u>Gallinago megala</u></a> Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In feature area
<a href="#"><u>Gallinago stenura</u></a> Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In feature area
<a href="#"><u>Haliaeetus leucogaster</u></a> White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Himantopus himantopus</u></a> Pied Stilt, Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
<a href="#"><u>Hirundapus caudacutus</u></a> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#"><u>Lathamus discolor</u></a> Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#"><u>Limosa lapponica</u></a> Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Limosa limosa</u></a> Black-tailed Godwit [845]	Endangered	Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
<a href="#"><u>Macronectes giganteus</u></a> Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><u>Macronectes halli</u></a> Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Merops ornatus</u></a> Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
<a href="#"><u>Monarcha melanopsis</u></a> Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#"><u>Myiagra cyanoleuca</u></a> Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#"><u>Neophema chrysostoma</u></a> Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
<a href="#"><u>Numenius madagascariensis</u></a> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Numenius minutus</u></a> Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Numenius phaeopus</u></a> Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Pachyptila turtur</u></a> Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
<a href="#"><u>Pandion haliaetus</u></a> Osprey [952]		Breeding known to occur within area	In feature area
<a href="#"><u>Pelagodroma marina</u></a> White-faced Storm-Petrel [1016]		Breeding known to occur within area	In buffer area only
<a href="#"><u>Phaethon lepturus</u></a> White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Phoebastria fusca</u></a> Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
<a href="#"><u>Pluvialis fulva</u></a> Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Pluvialis squatarola</u></a> Grey Plover [865]	Vulnerable	Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
<a href="#"><u>Pterodroma cervicalis</u></a> White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Recurvirostra novaehollandiae</u></a> Red-necked Avocet [871]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Rhipidura rufifrons</u></a> Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#"><u>Rostratula australis as Rostratula benghalensis (sensu lato)</u></a> Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
<a href="#"><u>Stercorarius antarcticus as Catharacta skua</u></a> Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
<a href="#"><u>Sterna striata</u></a> White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Sternula albifrons as Sterna albifrons</u></a> Little Tern [82849]		Breeding likely to occur within area	In feature area
<a href="#"><u>Symposiachrus trivirgatus as Monarcha trivirgatus</u></a> Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#"><u>Thalassarche bulleri</u></a> Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Thalassarche bulleri platei as Thalassarche sp. nov.</u></a> Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Thalassarche carteri</u></a> Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
<a href="#"><u>Thalassarche cauta</u></a> Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Thalassarche eremita</u></a> Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
<a href="#"><u>Thalassarche impavida</u></a> Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Thalassarche melanophris</u></a> Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Thalassarche salvini</u></a> Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
<a href="#"><u>Thalassarche steadi</u></a> White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
<a href="#"><u>Thalasseus bergii</u></a> as <a href="#"><u>Sterna bergii</u></a> Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
<a href="#"><u>Tringa brevipes</u></a> as <a href="#"><u>Heteroscelus brevipes</u></a> Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#"><u>Tringa nebularia</u></a> Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
<a href="#"><u>Tringa stagnatilis</u></a> Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area
<a href="#"><u>Xenus cinereus</u></a> Terek Sandpiper [59300]	Vulnerable	Foraging, feeding or related behaviour known to occur within area overfly marine area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
<b>Fish</b>			
<a href="#"><u>Acentronura tentaculata</u></a> Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Festucalex cinctus</u></a> Girdled Pipefish [66214]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Filicampus tigris</u></a> Tiger Pipefish [66217]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Heraldia nocturna</u></a> Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Hippichthys penicillatus</u></a> Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Hippocampus abdominalis</u></a> Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Hippocampus whitei</u></a> White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#"><u>Histiogamphelus briggsii</u></a> Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Lissocampus runa</u></a> Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Maroubra perserrata</u></a> Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Notiocampus ruber</u></a> Red Pipefish [66265]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#"><u>Phyllopteryx taeniolatus</u></a> Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Solegnathus spinosissimus</u></a> Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Solenostomus cyanopterus</u></a> Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Solenostomus paradoxus</u></a> Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Stigmatopora argus</u></a> Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Stigmatopora nigra</u></a> Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Syngnathoides biaculeatus</u></a> Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Trachyrhamphus bicoarctatus</u></a> Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Urocampus carinirostris</u></a> Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
<a href="#"><u>Vanacampus margaritifer</u></a> Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
<b>Mammal</b>			
<a href="#"><u>Arctocephalus forsteri</u></a> Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
<a href="#">Arctocephalus pusillus</a> Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area	In feature area
<a href="#">Dugong dugon</a> Dugong [28]		Species or species habitat may occur within area	In feature area
<b>Reptile</b>			
<a href="#">Caretta caretta</a> Loggerhead Turtle [1763]	Endangered	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#">Chelonia mydas</a> Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<a href="#">Dermochelys coriacea</a> Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
<a href="#">Eretmochelys imbricata</a> Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
<a href="#">Hydrophis platura</a> as <a href="#">Pelamis platurus</a> Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area	In feature area
<a href="#">Natator depressus</a> Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
<b>Whales and Other Cetaceans</b>		<b>[ Resource Information ]</b>	
Current Scientific Name	Status	Type of Presence	Buffer Status
<b>Mammal</b>			
<a href="#">Balaenoptera acutorostrata</a> Minke Whale [33]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
<a href="#"><i>Balaenoptera borealis</i></a> Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#"><i>Balaenoptera edeni</i></a> Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
<a href="#"><i>Balaenoptera musculus</i></a> Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
<a href="#"><i>Balaenoptera physalus</i></a> Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
<a href="#"><i>Caperea marginata</i></a> Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In feature area
<a href="#"><i>Delphinus delphis</i></a> Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
<a href="#"><i>Eubalaena australis</i></a> Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
<a href="#"><i>Grampus griseus</i></a> Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area
<a href="#"><i>Megaptera novaeangliae</i></a> Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
<a href="#"><i>Orcinus orca</i></a> Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
<a href="#"><i>Stenella attenuata</i></a> Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In feature area



Current Scientific Name	Status	Type of Presence	Buffer Status
<a href="#">Tursiops aduncus</a> Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
<a href="#">Tursiops truncatus s. str.</a> Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

### Extra Information

State and Territory Reserves			<a href="#">[ Resource Information ]</a>
Protected Area Name	Reserve Type	State	Buffer Status
Boondelbah	Nature Reserve	NSW	In buffer area only
Corrie Island	Nature Reserve	NSW	In buffer area only
Gir-um-bit	National Park	NSW	In buffer area only
John Gould	Nature Reserve	NSW	In buffer area only
Myall Lakes	National Park	NSW	In feature area
Port Stephens - Great Lakes	Marine Park	NSW	In feature area
Shark Island	Nature Reserve	NSW	In buffer area only
Tomaree	National Park	NSW	In buffer area only

Regional Forest Agreements	<a href="#">[ Resource Information ]</a>
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
<a href="#">North East NSW RFA</a>	New South Wales	In feature area

Nationally Important Wetlands		[ Resource Information ]
Wetland Name	State	Buffer Status
<a href="#">Myall Lakes</a>	NSW	In buffer area only
<a href="#">Port Stephens Estuary</a>	NSW	In feature area

EPBC Act Referrals				<a href="#">[ Resource Information ]</a>
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
<a href="#">Riverside residential development, Tea Gardens, NSW</a>	2013/7051		Assessment	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
<a href="#">Austasia Leefield Pty Ltd/Aquaculture/180 Clarke Street, Pindimar/NSW/Land-based Aquaculture Farm</a>	2014/7183	Not Controlled Action	Completed	In buffer area only
<a href="#">Growing of Pearl Oysters at Wanda Head, Mambo Creek and Pindimar Leases.</a>	2003/1157	Not Controlled Action	Completed	In feature area
<a href="#">Improving rabbit biocontrol: releasing another strain of RHDV, sthm two thirds of Australia</a>	2015/7522	Not Controlled Action	Completed	In feature area
<a href="#">Land based Marine Aquaculture facility</a>	2006/3158	Not Controlled Action	Completed	In buffer area only
<a href="#">Tomago to Tomaree Electricity Supply Upgrade</a>	2003/1023	Not Controlled Action	Completed	In feature area
<a href="#">Upgrading Existing &amp; Developing New Camping Facilities &amp; Amenities</a>	2002/679	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
<a href="#">Marine Aquaculture Research Lease, Providence Bay, Port Stephens</a>	2013/6790	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
<a href="#">Modification of Marine Aquaculture Research Lease and Huon Lease, Port Stephens</a>	2016/7709	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
<a href="#">Breeding program for Grey Nurse Sharks</a>	2007/3245	Referral Decision	Completed	In feature area
<a href="#">Riverside Residential and Commercial Development Project</a>	2012/6293	Referral Decision	Completed	In buffer area only
Biologically Important Areas			[ Resource Information ]	
Scientific Name		Behaviour	Presence	Buffer Status
Dolphins				
<a href="#">Tursiops aduncus</a>				
Indo-Pacific/Spotted Bottlenose Dolphin [68418]		Breeding	Known to occur	In feature area
<a href="#">Tursiops aduncus</a>				
Indo-Pacific/Spotted Bottlenose Dolphin [68418]		Breeding	Likely to occur	In buffer area only
Seabirds				
<a href="#">Ardenna grisea</a>				
Sooty Shearwater [82651]		Foraging	Likely to occur	In feature area

Scientific Name	Behaviour	Presence	Buffer Status
<a href="#"><u>Ardenna tenuirostris</u></a> Short-tailed Shearwater [82652]	Breeding	Known to occur	In buffer area only
<a href="#"><u>Ardenna tenuirostris</u></a> Short-tailed Shearwater [82652]	Foraging	Likely to occur	In feature area
<a href="#"><u>Ardenna tenuirostris</u></a> Short-tailed Shearwater [82652]	Foraging	Likely to occur	In feature area
<a href="#"><u>Pterodroma leucoptera leucoptera</u></a> Goulds Petrel [26033]	Breeding	Known to occur	In buffer area only
<a href="#"><u>Pterodroma leucoptera leucoptera</u></a> Goulds Petrel [26033]	Foraging	Known to occur	In feature area
<b>Sharks</b>			
<a href="#"><u>Carcharias taurus</u></a> Grey Nurse Shark [64469]	Foraging	Known to occur	In feature area
<a href="#"><u>Carcharodon carcharias</u></a> White Shark [64470]	Aggregation	Known to occur	In buffer area only
<b>Whales</b>			
<a href="#"><u>Megaptera novaeangliae</u></a> Humpback Whale [38]	Migration (north and south)	Known to occur	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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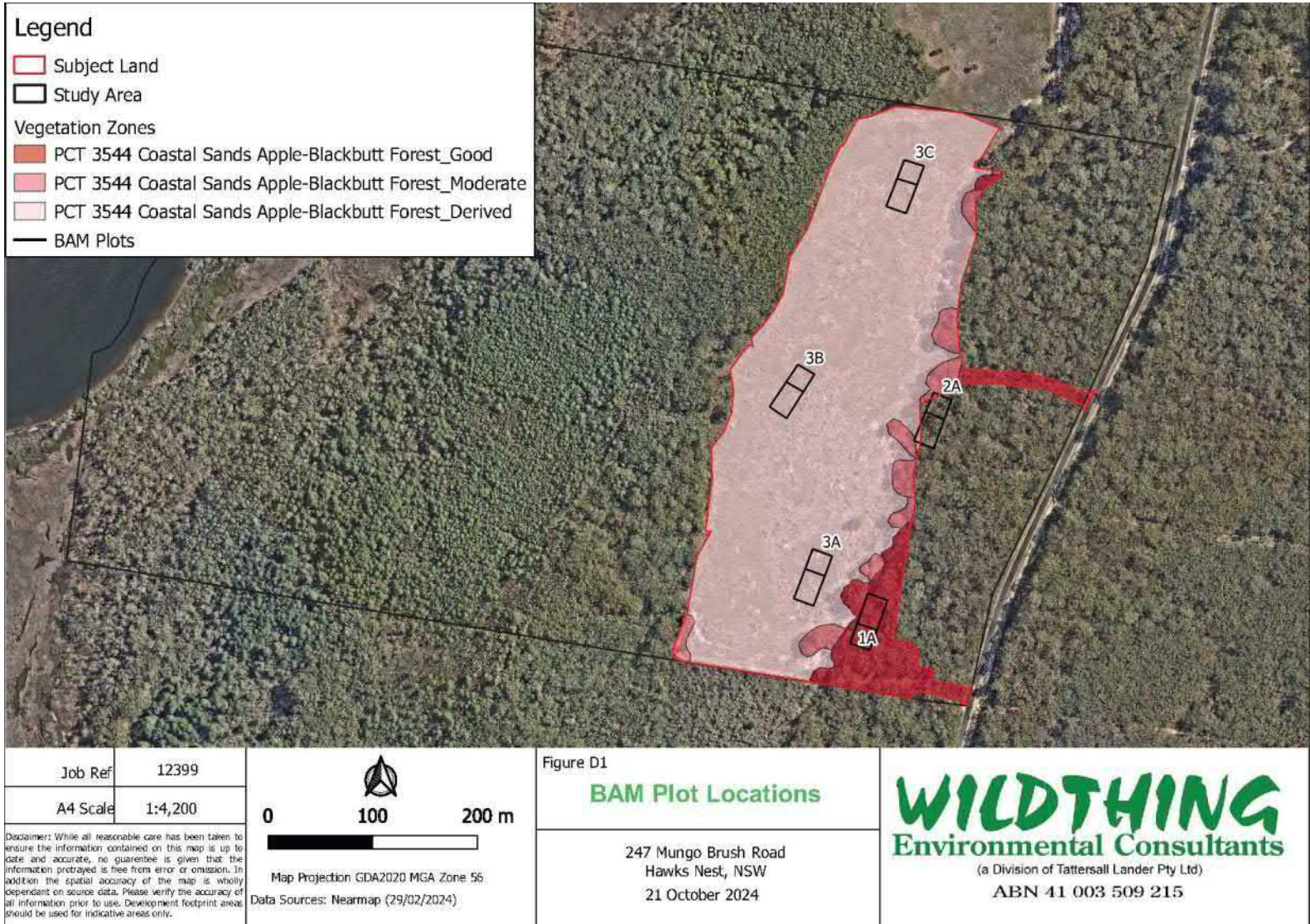
Appendix D: Vegetation survey data

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	3544	1.06	101	Good	56	423188	6386756.0	11	2	21	2	2	1	1	25.0	67.6	8.1	10.5	1.5	1.0	3	0	84.0	5.7	1	1	1	1	1	1	0	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
2A	3544	0.54	101	Moderate	56	423269	6386997.0	180	3	8	1	1	1	6	25.2	1.3	3.0	0.1	20.0	0.6	6	2	73.0	8.9	0	1	1	1	1	0	0.1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3A	3544	8.70	101	Derived	56	423154	6386848.0	183	1	7	3	2	0	1	0.2	2.5	12.1	0.2	0.0	0.1	0	0	60.0	0.0	0	0	0	0	0	1	0.3	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3B	3544	8.70	101	Derived	56	423138	6387024.0	200	0	8	2	1	1	0	0.0	1.1	0.6	0.1	15.0	0.0	0	0	50.0	1.1	0	0	0	0	0	0	4.1	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
3C	3544	8.70	101	Derived	56	423243	6387221.0	186	1	3	2	2	1	0	0.3	0.4	5.1	0.5	15.0	0.0	0	0	65.0	0.0	0	0	0	0	0	0	0.5	<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.





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-423178 N-6386756	E-423204 N-6386799	20x20	16/8/19	Start -	End -	Daryl K+L
Photo# 2147	Photo# 2149	IBRA region	NSW North Coast			
Bearing 11°N		Bearing 199°S	Vegetation Class Coastal Dune Dry Sclerophyll Forest			
PCT # 1648		PCT Name	Smooth-barked Apple Blackbutt Open Forest of the Torrington Peninsula			
Consistent BC ACT TEC? 3544 NO		3544 - COASTAL SANDS APPLE BLACKBUTT FOREST				

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	2
	Shrubs	21
	Grasses etc.	2
	Forbs	2
	Ferns	1
	Other	1
Sum of Cover of native vascular plants by growth form group	Trees	25
	Shrubs	67.6
	Grasses etc.	8.1
	Forbs	10.5
	Ferns	1.5
	Other	1
High Threat Weed cover		0

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		0
50 – 79 cm	✓ 3	
30 – 49 cm	✓	
20 – 29 cm	✓	
10 – 19 cm	✓	
5 – 9 cm	✓	
Regeneration < 5 cm	✓	
Length of logs (m) (≥10 cm diameter, >50 cm in length)		0.5 3.2 2.0 = 5.7m

**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)	90 85 65 85 95	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	84	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: Day scat

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400 m <sup>2</sup> plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	16/8/19	Hawks NEST	1A	Daryl, Kylie

GF	Species	Cover	Abund	voucher
T	1 <i>Corymbia gummifera</i>	20	26	
SG	2 <i>Nematospora squamea</i>	7	5	
SG	3 <i>Monotoca elliptica</i>	15	21	
SG	4 <i>Leptospermum trinervia</i>	7	15	
SG	5 <i>Ricinocarpus pinifolius</i>	5	17	
SG	6 <i>Acacia brownii</i>	1	5	
SG	7 <i>Woolisia pungens</i>	5	23	
SG	8 <i>Leucopogon parviflorus</i>	5	8	
SG	9 <i>Eriostemon australasicus</i>	8	18	
SG	10 <i>Leptomeria acida</i>	1	1	
FG	11 <i>Actinotus helianthus</i>	0.5	11	
FG	12 <i>Dianella caerulea producta</i>	10	400	
SG	13 <i>Tetratheca thymifolia</i>	1	15	
GG	14 <i>Lemnandra longifolia</i>	8	43	
SG	15 <i>Aotus ericoides</i>	0.3	578	
T	16 <i>Banksia serrata</i>	5	3	
SG	17 <i>Leucopogon lanceolata</i>	8	18	
SG	18 <i>Brachylaena aphyodes</i>	2	6	
OG	19 <i>Pandorea pandorana</i>	1	15	
SG	20 <i>Cenaspasma ericoides</i>	0.5	6	
EG	21 <i>Pteridium esculentum</i>	1.5	15	
SG	22 <i>Dillwynia retorta</i>	0.5	6	
SG	23 <i>Hibbertia linearis</i>	0.3	5	
SG	24 <i>Leucopogon ericoides</i>	0.1	1	
SG	25 <i>Acacia longifolia</i>	0.2	13	
SG	26 <i>Leptospermum polygalifolium</i>	0.5	5	
GG	27 <i>Schoenus imberbis</i>	0.1	1	
SG	28 <i>Epraea patchella</i>	0.1	1	
SG	29 <i>Astroloma pinifolium</i>	0.1	1	
	30			
	31			
	32			
	33			
	34			
	35			
	36			
	37			
	38			
	39			
	40			
	41			
	42			
	43			
	44			

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-423269 N-4386997	E-423253 N-4386956		22/11/2019	Start - WP 4	End - WP 5	Pangl
Photo# <u>47359</u>		Photo# <u>47360</u>		IBRA region <u>NSW North Coast</u>		
Bearing <u>180°</u>		Bearing <u>360°</u>		Vegetation Class <u>Coastal Dune Dry Sclerophyll Forest</u>		
PCT # <u>1698</u>		PCT Name <u>Smooth-barked Apple Blackbutt Open Forest of the Endeavour Peninsula</u>		Vegetation Zone <u>Moderate</u>		
Consistent BC ACT TEC? <u>3544</u>		NO <u>COASTAL SAND APPLE BLACKBUTT FOREST</u>				

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	<u>3</u>
	Shrubs	<u>8</u>
	Grasses etc.	<u>1</u>
	Forbs	<u>1</u>
	Ferns	<u>1</u>
	Other	<u>6</u>
Sum of Cover of native vascular plants by growth form group	Trees	<u>25.2</u>
	Shrubs	<u>1.3</u>
	Grasses etc.	<u>3</u>
	Forbs	<u>0.1</u>
	Ferns	<u>2.0</u>
	Other	<u>0.6</u>
High Threat Weed cover		<u>0.1</u>

BAM Attribute (1000 m² plot)		
DBH	# Tree Stems Count	# Stems with Hollows
80 + cm		11  = 2
50 - 79 cm	<u>0.62m 0.54 0.74</u> <u>0.51 0.58 0.51</u>	
30 - 49 cm	<u>✓</u>	
20 - 29 cm	<u>✓</u>	
10 - 19 cm	<u>✓</u>	
5 - 9 cm		
Regeneration < 5 cm		
Length of logs (m) (≥10 cm diameter, >50 cm in length)		<u>3.5m</u> <u>4.3m - 8.9m</u> <u>1.1m</u>

**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)	<u>90 60 70 75 70</u>	<u>0 15 10 5 15</u>	<u>0 0 0 0 0</u>	<u>0 0 0 0 0</u>
Average of the 5 subplots	<u>73</u>			

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 <u>Sand</u>	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 <sup>2</sup> plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	22/11/2019	HAWKS NEST	ZA	DARYL

GF	Species	Cover	Abund	voucher
T	1 <i>Corymbia gummitera</i>	20	5	
T	2 <i>Encalyptus pilularis</i>	5	1	
EG Fern	3 <i>Pteridium esculentum</i>	20	300	
SG	4 <i>Monotoca elliptica</i>	0.2	5	
OG	5 <i>Livistona australis</i>	0.1	1	
FG	6 <i>Dianella caerulea prostrata</i>	0.1	10	
OG	7 <i>Cymbidium suave</i>	0.1	1	
SG	8 <i>Leptospermum trinervium</i>	0.2	6	
SG	9 <i>Hibbertia linearis</i>	0.1	2	
OG	10 <i>Dendrophthoe vitellina</i>	0.1	2	
OG	11 <i>Notothix subaureus</i>	0.1	1	
GG	12 <i>Lomandra longifolia</i>	3	35	
SG	13 <i>Leptospermum polygalifolia</i>	0.2	2	
SG	14 <i>Tetradlea thymifolia</i>	0.2	10	
SG	15 <i>Leucopogon lanceolatus</i>	0.2	2	
OG	16 <i>Pandorea pandorana</i>	0.1	1	
WH	17 <i>Pinus elliotii</i> seedling	0.1	1	
SG	18 <i>Dillwynia retorta</i>	0.1	2	
OG	19 <i>Hibbertia scandens</i>	0.1	1	
SG	20 <i>Begonia oblongifolia</i>	0.1	1	
T	21 <i>Encalyptus piperita</i>	0.2	1	
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HAWKS NEST

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
E-423154 N-6386898	E-423135 N-6386802	20x20	20/11/2018	Start - 149	End - 150	DARYL
IBRA region		NSW North Coast				
Photo# 47260	Photo# 47262	Vegetation Class Coastal Dune Dry Sclerophyll Forest				
Bearing 183°	Bearing 7°	Vegetation Zone (Derived Vegetation)				
PCT # 1648	PCT Name Smooth-barked Apple Blackbutt Open Forest of the Tomaree Peninsula	Consistent BC ACT TEC? 3588				
PCT 3544 COASTAL SANDS APPLE BLACKBUTT FOREST						

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	7
	Grasses etc.	3
	Forbs	2
	Ferns	0
	Other	1
Sum of Cover of native vascular plants by growth form group	Trees	0.2
	Shrubs	2.5
	Grasses etc.	12.1
	Forbs	0.2
	Ferns	0
	Other	0.1
High Threat Weed cover		0.3

BAM Attribute (1000 m² 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)	80 70 65 65 70	5 5 10 10 80	0 0 0 0 0 0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	60			

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: Area subject to routine maintenance of understory  
Pine cones in site

Wildthing Environmental Consultants - Office # (02) 49513311

400 m <sup>2</sup> plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	20/11/2019		3A	DARYL

GF	Species	Cover	Abund	voucher
GG	1 <i>Lomandra longifolia</i>	2	20	
SG	2 <i>Leptospermum trinervium</i>	1	20	
GG	3 <i>Imperata cylindrica</i>	10	400	
SG	4 <i>Hibbertia linearis</i>	1	15	
FG	5 <i>Actinotus halimifolius</i>	0.1	5	
T	6 <i>Banksia integrifolia</i>	0.2	7	
SG	7 <i>Brachyloma daphnoides</i>	0.1	7	
W	8 <i>Hypochaeris radicata</i> *	0.1	3	
SG	9 <i>Menotoca elliptica</i>	0.1	2	
WH	10 <i>Senecio madagascariensis</i>	0.1	5	
WH	11 <i>Chrysanthemoides monilifera</i> <sup>retrorsa</sup>	0.2	15	
OG	12 <i>Billardiera scandens</i>	0.1	7	
GG	13 <i>Eragrostis interrupta</i>	0.1	1	
SG	14 <i>Acacia longifolia</i>	0.1	1	
SG	15 <i>Ptilimnium retortum</i>	0.1	2	
SG	16 <i>Persea laevis</i>	0.1	1	
FG	17 <i>Calochortus</i> sp (seed)	0.1	1	
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Wildthing Environmental Consultants - Office # (02) 49513311

**BAM Site – Field Survey Form** Plot Identifier: **3B**

Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders
E-423138	E-423110	20x20	20/11/2019	Start - 151	End - 152	DARYL
N-6387024	N-6386980	IBRA region	NSW North Coast			
Photo# 7268	Photo# 7270	Vegetation Class	Coastal Dune Dry Sclerophyll Forest			
Bearing 200°	Bearing 13°	Vegetation Zone	(Derived Vegetation)			
PCT # 1648	PCT Name	Smooth-barked Apple Blackbutt open Forest of the Tamarine Peninsula				
Consistent BC ACT/TEC? 3544	NO	PCT 3544 - COASTAL SANDS APPLE BLACK BUTT FOREST				

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	0
	Shrubs	18
	Grasses etc.	2
	Forbs	1
	Ferns	1
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0
	Shrubs	1.1
	Grasses etc.	0.6
	Forbs	0.1
	Ferns	15
	Other	0
High Threat Weed cover		4.1

BAM Attribute (1000 m² 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)		1.1

**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)	60 80 20 80 30	10 10 30 0 30	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	50			

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 <sup>2</sup> plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	20/11/2019	HAWKS NEST	3B	DARYL

GF	Species	Cover	Abund	voucher
EG- Fern	1 <i>Pteridium esculentum</i>	15	400	
W	2 <i>Hypochaeris radicata</i>	0.1	10	
SG	3 <i>Hibbertia linearis</i>	0.3	20	
SG	4 <i>Leptospermum trinervium</i>	0.1	5	
GG	5 <i>Lomandra longifolia</i>	0.5	11	
SG	6 <i>Brachyloma daphnoides</i>	0.2	10	
HW	7 <i>Chrysanthemoides monilifera</i>	4	50	
SG	8 <i>Hibbertia fasciculata</i>	0.1	3	
HW	9 <i>Senecio madagascariensis</i>	0.1	5	
SG	10 <i>Acacia longifolia</i>	0.1	5	
SG	11 <i>Leucopogon longicaulus</i>	0.1	7	
SG	12 <i>Dillwynia retorta</i>	0.1	3	
W	13 <i>Conyza pinnata</i>	0.1	1	
W	14 <i>Gnaphalium purpureum</i>	0.1	3	7279
GG	15 <i>Eragrostis interrupta</i>	0.1	3	
FG	16 <i>Dianella caerulea</i>	0.1	4	
SG	17 <i>Borreria rhombifolia</i>	0.1	2	
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Wildthing Environmental Consultants - Office # (02) 49513311

**BAM Site - Field Survey Form** Plot Identifier: 3C

Midline start	Midline end	Plot Size	Date	Plot Waypoint ID		Recorders
E-423243 N-6387221	E-423223 N-6387175	20x20	20/11/2019	Start - 153	End - 154	DARYL
IBRA region		NSW North Coast				
Photo# #7293		Vegetation Class Coastal Dune Dry Sclerophyll Forest				
Bearing 186°		Vegetation Zone (Derived Vegetation)				
PCT #	1648	PCT Name Smooth-barked Apple Blackbutt open Forest of the Torrington Peninsula				
Consistent BC ACT/TEC?	3544	PCT 3544 - COASTAL SANDS APPLE BLACKBUTT FOREST				

BAM Attribute (400 m² plot)		Sum values
Count of Native Richness	Trees	1
	Shrubs	3
	Grasses etc.	2
	Forbs	2
	Ferns	1
	Other	0
Sum of Cover of native vascular plants by growth form group	Trees	0.3
	Shrubs	0.4
	Grasses etc.	5.1
	Forbs	0.5
	Ferns	15
	Other	0
High Threat Weed cover		0.5

BAM Attribute (1000 m² 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)	10 20 15 10 10	70 50 90 70 75	0 0 0 0 0	0 0 0 0 0
Average of the 5 subplots	65			

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: Ground cover maintained low to ground

Wildthing Environmental Consultants - Office # (02) 49513311

400 m <sup>2</sup> plot: Sheet _ of _		Survey Name	Plot Identifier	Recorders
Date	20/11/2019	HAWKS NEST	3C	DARYL

GF	Species	Cover	Abund	voucher
EG	1 <i>Pteridium esculentum</i>	15	600	
GG	2 <i>Lomandra longifolia</i>	5	100	
W	3 <i>Hypochaeris radicata</i>	0.1	15	
WH	4 <i>Chrysanthemoides monilifera</i>	0.5	20	
FG	5 <i>Dianella caerulea</i> - prostrata	0.4	15	
SG	6 <i>Hibbertia linearis</i>	0.2	20	
T	7 <i>Allocasuarina littoralis</i>	0.3	10	
WAG	8 <i>Eragrostis interrupta</i>	0.1	4	
W	9 <i>Coryza parva</i>	0.1	5	
SG	10 <i>Persea lanceolata</i>	0.1	1	
W	11 <i>Gnaphalium purpureum</i>	0.1	1	
FG	12 <i>Paranthera microphylla</i>	0.1	1	
SG	13 <i>Dillwynia retorta</i>	0.1	2	
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**Plate D1: Plot 1A-PCT 3544\_Good Front Peg.**



**Plate D2: Plot 1A-PCT 3544\_Good Back Peg.**





**Plate D3: Plot 2A-PCT 3544\_Moderate Front Peg.**



**Plate D4: Plot 2A-PCT 3544\_Moderate Back Peg.**





**Plate D5: Plot 3A-PCT 3544\_Derived Front Peg.**



**Plate D6: Plot 3A-PCT 3544\_Derived Back Peg.**





**Plate D7: Plot 3B-PCT 3544\_Derived Front Peg.**



**Plate D8: Plot 3B PCT 3544\_Derived Back Peg.**





**Plate D9: Plot 3C PCT 3544\_Derived Front Peg.**



**Plate D10: Plot 3C-PCT 3544\_Derived Back Peg.**

Appendix E: Credit reports



BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00050112/BAAS17074/24/00050113	Proposed Caravan Park Development - Hawks Nest	14/03/2024
Assessor Name	Report Created	BAM Data version *
Daryl Harman	22/10/2024	67
Assessor Number	BAM Case Status	Date Finalised
BAAS17074	Finalised	22/10/2024
Assessment Revision	Assessment Type	BOS entry trigger
2	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
Coastal Sands Apple-Blackbutt Forest												
1	3544_Good	Not a TEC	63.9	63.9	1.1	PCT Cleared - 22%	High Sensitivity to Gain			1.50		25





## BAM Credit Summary Report

2	3544_Mod erate	Not a TEC	42.5	42.5	0.54	PCT Cleared - 22%	High Sensitivity to Gain		1.50	9
3	3544_Deri ved	Not a TEC	12.3	12.3	8.7	PCT Cleared - 22%	High Sensitivity to Gain		1.50	0
									<b>Subtotal</b>	<b>34</b>
									<b>Total</b>	<b>34</b>

### 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 SAIL	Species credits
<b><i>Ninox strenua</i> / Powerful Owl ( Fauna )</b>									
3544_Good	63.9	63.9	1.1	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	34
								<b>Subtotal</b>	<b>34</b>
<b><i>Petaurus norfolcensis</i> / Squirrel Glider ( Fauna )</b>									
3544_Good	63.9	63.9	1.1	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	34



## BAM Credit Summary Report

3544_Moderate	42.5	42.5	0.54	Biodiversity Conservation Act listing status	Species dependent on habitat attributes	Vulnerable	Not Listed	False	11
								<b>Subtotal</b>	<b>45</b>
<b><i>Phascolarctos cinereus / Koala ( Fauna )</i></b>									
3544_Good	63.9	63.9	1.1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	34
3544_Moderate	42.5	42.5	0.54	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Endangered	Endangered	False	11
								<b>Subtotal</b>	<b>45</b>
<b><i>Potorous tridactylus / Long-nosed Potoroo ( Fauna )</i></b>									
3544_Good	63.9	63.9	1.1	Biodiversity Conservation Act listing status	Effectiveness of management in controlling threats	Vulnerable	Vulnerable	False	34
								<b>Subtotal</b>	<b>34</b>



BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00050112/BAAS17074/24/00050113	Proposed Caravan Park Development - Hawks Nest	14/03/2024
Assessor Name	Assessor Number	BAM Data version *
Daryl Harman	BAAS17074	67
Proponent Names	Report Created	BAM Case Status
	22/10/2024	Finalised
Assessment Revision	Assessment Type	Date Finalised
2	Part 4 Developments (General)	22/10/2024
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 4
00050112/BAAS17074/24/00050113	Proposed Caravan Park Development - Hawks Nest	



## 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

**Ephippiorhynchus asiaticus** / Black-necked Stork

**Esacus magnirostris** / Beach Stone-curlew

**Pandion cristatus** / Eastern Osprey

### 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
3544-Coastal Sands Apple-Blackbutt Forest	Not a TEC	10.3	9	25	34

**3544- Coastal Sands Apple-Blackbutt Forest**

#### Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
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Assessment Id

00050112/BAAS17074/24/00050113

Proposal Name

Proposed Caravan Park Development - Hawks Nest

Page 2 of 4





## BAM Biodiversity Credit Report (Like for like)

	Coastal Dune Dry Sclerophyll Forests This includes PCT's: 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556	Coastal Dune Dry Sclerophyll Forests <50%	3544_Good	No	25 Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Coastal Dune Dry Sclerophyll Forests This includes PCT's: 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556	Coastal Dune Dry Sclerophyll Forests <50%	3544_Moderate	Yes	9 Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Coastal Dune Dry Sclerophyll Forests This includes PCT's: 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556	Coastal Dune Dry Sclerophyll Forests <50%	3544_Derived	No	0 Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Assessment Id

00050112/BAAS17074/24/00050113

Proposal Name

Proposed Caravan Park Development - Hawks Nest

Page 3 of 4



## BAM Biodiversity Credit Report (Like for like)

### Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
<b>Ninox strenua</b> / Powerful Owl	<b>3544_Good</b>	1.1	34.00
<b>Petaurus norfolcensis</b> / Squirrel Glider	<b>3544_Good, 3544_Moderate</b>	1.6	45.00
<b>Phascolarctos cinereus</b> / Koala	<b>3544_Good, 3544_Moderate</b>	1.6	45.00
<b>Potorous tridactylus</b> / Long-nosed Potoroo	<b>3544_Good</b>	1.1	34.00

### Credit Retirement Options

Like-for-like credit retirement options

<b>Ninox strenua</b> / Powerful Owl	Spp	IBRA subregion
	<b>Ninox strenua</b> / Powerful Owl	Any in NSW
<b>Petaurus norfolcensis</b> / Squirrel Glider	Spp	IBRA subregion
	<b>Petaurus norfolcensis</b> / Squirrel Glider	Any in NSW
<b>Phascolarctos cinereus</b> / Koala	Spp	IBRA subregion
	<b>Phascolarctos cinereus</b> / Koala	Any in NSW
<b>Potorous tridactylus</b> / Long-nosed Potoroo	Spp	IBRA subregion
	<b>Potorous tridactylus</b> / Long-nosed Potoroo	Any in NSW

Assessment Id  
00050112/BAAS17074/24/00050113

Proposal Name  
Proposed Caravan Park Development - Hawks Nest

Page 4 of 4



BAM Biodiversity Credit Report (Variations)

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00050112/BAAS17074/24/00050113	Proposed Caravan Park Development - Hawks Nest	14/03/2024
Assessor Name	Assessor Number	BAM Data version *
Daryl Harman	BAAS17074	67
Proponent Name(s)	Report Created	BAM Case Status
	22/10/2024	Finalised
Assessment Revision	Assessment Type	Date Finalised
2	Part 4 Developments (General)	22/10/2024
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	Page 1 of 6
00050112/BAAS17074/24/00050113	Proposed Caravan Park Development - Hawks Nest	



## BAM Biodiversity Credit Report (Variations)

PCT							
No Changes							
Predicted Threatened Species Not On Site							
Name							
Ephippiorhynchus asiaticus / Black-necked Stork							
Esacus magnirostris / Beach Stone-curlew							
Pandion cristatus / Eastern Osprey							
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
3544-Coastal Sands Apple-Blackbutt Forest		Not a TEC		10.3	9	25	34.00
3544-Coastal Sands Apple-Blackbutt Forest	Like-for-like credit retirement options						
	Class	Trading group	Zone	HBT	Credits	IBRA region	
	Coastal Dune Dry Sclerophyll Forests This includes PCT's: 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556	Coastal Dune Dry Sclerophyll Forests <50%	3544_Good	No	25	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.	





## BAM Biodiversity Credit Report (Variations)

Coastal Dune Dry Sclerophyll Forests This includes PCT's: 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556	Coastal Dune Dry Sclerophyll Forests <50%	3544_Mod erate	Yes	9	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Coastal Dune Dry Sclerophyll Forests This includes PCT's: 3544, 3545, 3546, 3547, 3548, 3549, 3550, 3551, 3552, 3553, 3554, 3555, 3556	Coastal Dune Dry Sclerophyll Forests <50%	3544_Deriv ed	No	0	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
<b>Variation options</b>					
Formation	Trading group	Zone	HBT	Credits	IBRA region
Dry Sclerophyll Forests (Shrubby sub-formation)	Tier 4 or higher threat status	3544_Good	No	25	IBRA Region: NSW North Coast, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Dry Sclerophyll Forests (Shrubby sub-formation)	Tier 4 or higher threat status	3544_Mod erate	Yes (includi ng artificia l)	9	IBRA Region: NSW North Coast, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.



## BAM Biodiversity Credit Report (Variations)

	Dry Sclerophyll Forests (Shrubby sub-formation)	Tier 4 or higher threat status	3544_Deriv ed	No	0	IBRA Region: NSW North Coast, or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
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### Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
<b>Ninox strenua</b> / Powerful Owl	<b>3544_Good</b>	1.1	34.00
<b>Petaurus norfolcensis</b> / Squirrel Glider	<b>3544_Good, 3544_Moderate</b>	1.6	45.00
<b>Phascolarctos cinereus</b> / Koala	<b>3544_Good, 3544_Moderate</b>	1.6	45.00
<b>Potorous tridactylus</b> / Long-nosed Potoroo	<b>3544_Good</b>	1.1	34.00

### Credit Retirement Options Like-for-like options

<b>Ninox strenua</b> / Powerful Owl	Spp	IBRA region
	<b>Ninox strenua</b> /Powerful Owl	Any in NSW
	<b>Variation options</b>	
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below
		IBRA region

Assessment Id

00050112/BAAS17074/24/00050113

Proposal Name

Proposed Caravan Park Development - Hawks Nest

Page 4 of 6



## BAM Biodiversity Credit Report (Variations)

	Fauna	Vulnerable	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
<b>Petaurus norfolcensis/</b> Squirrel Glider	Spp		IBRA region
	<b>Petaurus norfolcensis/</b> Squirrel Glider		Any in NSW
	<b>Variation options</b>		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Fauna	Vulnerable	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
<b>Phascolarctos cinereus/</b> Koala	Spp		IBRA region
	<b>Phascolarctos cinereus/</b> Koala		Any in NSW
	<b>Variation options</b>		
	Kingdom	Any species with same or higher category of listing	IBRA region

Assessment Id

00050112/BAAS17074/24/00050113

Proposal Name

Proposed Caravan Park Development - Hawks Nest

Page 5 of 6



## BAM Biodiversity Credit Report (Variations)

		under Part 4 of the BC Act shown below	
	Fauna	Endangered	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
<b>Potorous tridactylus/</b> Long-nosed Potoroo	Spp	IBRA region	
	<b>Potorous tridactylus/</b> Long-nosed Potoroo	Any in NSW	
	<b>Variation options</b>		
	Kingdom	Any species with same or higher category of listing under Part 4 of the BC Act shown below	IBRA region
	Fauna	Vulnerable	Karuah Manning, Hunter, Macleay Hastings, Mummel Escarpment and Upper Hunter. 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 SAIL

### 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	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<b>CLASS LYCOPSIDA (Clubmosses and Quillworts)</b>								
<b>Selaginellaceae</b>								*
<i>Selaginella uliginosa</i>								
<b>CLASS FILICOPSIDA (Ferns)</b>								
<b>Adiantaceae</b> syn. Sinopteridaceae								
<b>Aspleniaceae</b>								
<i>Asplenium australasicum</i>	Birdnest Fern							*
<b>Blechnaceae</b>								
<i>Telmatoblechnum indicum</i> syn. <i>Blechnum indicum</i>	Swamp Water Fern							*
<b>Davalliaceae</b>								
<i>Nephrolepis cordifolia</i>	Fishbone Fern						*	*
<b>Dennstaedtiaceae</b>								
<i>Histiopteris incisa</i>	Batswing Fern							*
<i>Hypolepis muelleri</i>	Harsh Ground Fern							*
<i>Pteridium esculentum</i>	Bracken						*	*
<b>Dicksoniaceae</b>								
<i>Calochlaena dubia</i>	Soft Bracken Fern							*
<b>Gleicheniaceae</b>								
<i>Gleichenia dicarpa</i>	Pouched Coral Fern							*
<b>Polypodiaceae</b>								
<i>Platynerium bifurcatum</i>	Elkhorn				W			*
<i>Pyrrosia rupestris</i>	Rock Felt Fern							*

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<b>Schizaeaceae</b>								
<i>Schizaea dichotoma</i>	Branched Comb Fern						*	*
<b>CYCADOPSIDA (Cycads)</b>								
<b>Zamiaceae</b>								
<i>Macrozamia communis</i>	Burrawang						*	*
<b>CONIFEROPSIDA (Conifers)</b>								
<b>Pinaceae</b>								
<i>*Pinus elliotii</i>	Slash Pine						*	*
<b>MAGNOLIOPSIDA: Magnoliidae</b>								
<b>LILOPSIDA: (Monocotyledons)</b>								
<b>Arecaceae</b>								
<i>Livistona australis</i>	Cabbage-tree Palm						*	*
<b>Asparagaceae</b>								
<i>*Asparagus aethiopicus</i>	Asparagus Fern							*
<i>Cordyline stricta</i>	Narrow-leaved Palm Lily							
<i>Eustrephus latifolius</i>	Wombat Berry						*	*
<i>Lomandra cylindrica</i>							*	*
<i>Lomandra glauca</i>	Pale Mat-rush						*	*
<i>Lomandra longifolia</i>	Spiny Mat Rush						*	*
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	Many-flowered Mat-rush						*	*
<i>Thysanotus tuberosus</i>	Common Fringe Lily						*	*
<b>Asphodelaceae</b>								
<i>Dianella caerulea</i> var. <i>assera</i>	Blue Flax-lily						*	*
<i>Tricoryne elatior</i>	Yellow Rush-lily						*	*
<i>Xanthorrhoea latifolia</i> subsp. <i>latifolia</i>							*	*

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<b>Commelinaceae</b>								
<i>Commelina cyanea</i>	Scurvy Weed						*	*
* <i>Tradescantia fluminensis</i>	Wandering Jew							*
<b>Cyperaceae</b>								
<i>Machaerina articulata</i> syn. <i>Baumea articulata</i>								*
<i>Machaerina juncea</i> syn. <i>Baumea juncea</i>								*
<i>Machaerina rubiginosa</i> syn. <i>Baumea rubiginosa</i>	Soft Twigrush							*
<i>Cyperus polystachyos</i>	Bunchy Sedge							*
<i>Gahnia aspera</i>	Rough Saw Sedge							*
<i>Gahnia clarkei</i>	Sword Grass						*	*
<i>Lepidosperma laterale</i>	Sword Sedge						*	*
<i>Schoenus imberbis</i>	Beardless Bog-rush							
<b>Juncaceae</b>								
<i>Juncus kraussii</i>	Sea Rush							*
<b>Menyanthaceae</b>								
<i>Liparophyllum exaltatum</i> syn. <i>Villarsia exaltata</i>	Yellow Marsh Flower							*
<b>Orchidaceae</b>								
<i>Acianthus caudatus</i> syn. <i>Nemacianthus caudatus</i>	Mayfly Orchid						*	*
<i>Acianthus fornicatus</i>	Pixie Orchid						*	*
<i>Caladenia alata</i> syn. <i>Petalochilus alatus</i>	Fairy Orchid						*	*
<i>Caladenia carnea</i> syn. <i>Petalochilus carneus</i>	Pink Fingers						*	*
<i>Caladenia catenata</i> syn. <i>Petalochilus catenatus</i>	White Fingers						*	*
<i>Caladenia picta</i> syn. <i>Petalochilus pictus</i>							*	*



SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<i>Caladenia quadrifaria</i> syn. <i>Petalochilus quadrifarius</i>	Large Pink Fingers						*	*
<i>Caleana major</i>	Large Duck Orchid						*	*
<i>Calochilus paludosus</i>	Red Beardie						*	*
<i>Calochilus robertsonii</i>	Purplish Beard Orchid						*	*
<i>Cymbidium suave</i>	Snake Flower						*	*
<i>Dendrobium teretifolium</i>	Pencil Orchid							*
<i>Dipodium variegatum</i>	Hyacinth Orchid						*	*
<i>Pterostylis grandiflora</i>	Cobra Greenhood						*	*
<i>Pterostylis longifolia</i>	Tall Greenhood						*	*
<i>Pterostylis nutans</i>	Nodding Greenhood						*	*
<i>Thelymitra pauciflora</i>	Slender Sun Orchid						*	*
<b>Poaceae</b>								
* <i>Andropogon virginicus</i>	Whisky Grass						*	*
<i>Austrostipa pubescens</i>							*	*
* <i>Axonopus fissifolius</i>	Narrow-leaved Carpet Grass						*	*
* <i>Briza maxima</i>	Quaking Grass						*	*
* <i>Briza minor</i>	Shivery Grass						*	*
* <i>Cortaderia selloana</i>	Pampas Grass							*
<i>Cynodon dactylon</i>	Common Couch						*	*
<i>Digitaria parviflora</i>	Smallflower Fingergrass						*	*
* <i>Ehrharta erecta</i>	Panic Veldt Grass						*	*
<i>Entolasia marginata</i>	Bordered Panic						*	*
* <i>Eragrostis curvula</i>	African Lovegrass						*	*
<i>Imperata cylindrica</i> var. <i>major</i>	Blady Grass						*	*
<i>Ischaemum australe</i>	Thigh-socket Grass							*
* <i>Megathyrsus maximus</i> syn. <i>Panicum maximum</i>	Guinea Grass						*	*

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<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>Phragmites australis</i>	Native Reed							*
<i>Rytidosperma fulvum</i>	Wallaby Grass						*	*
<i>Sporobolus virginicus</i>	Sand Couch							*
<i>*Stenotaphrum secundatum</i>	Buffalo Grass						*	*
<i>Themeda triandra</i> syn. <i>Themeda australis</i>	Kangaroo Grass						*	*
<b>Restionaceae</b>								
<i>Baloskion tetraphyllum</i> subsp. <i>meiostachyum</i>	Plume Rush							*
<i>Hypolaena fastigiata</i>							*	*
<b>Ripogonaceae</b>								
<i>Ripogonum album</i>	White Supplejack							*
<b>Smilacaceae</b>								
<i>Smilax australis</i>	Smilax							*
<i>Smilax glycyphylla</i>	Native Sarsaparilla						*	*
<b>Typhaceae</b>								
<i>Typha orientalis</i>	Cumbungi							*
<b>MAGNOLIIDAE (Dicotyledons)</b>								
<b>Acanthaceae</b>								
<i>Avicennia marina</i> var. <i>australasia</i>	Grey Mangrove							*
<b>Aizoaceae</b>								
<i>Tetragonia tetragonioides</i>	New Zealand Spinach							*

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<b>Apiaceae</b>								
<i>Actinotus helianthi</i>	Flannel Flower						*	*
<i>Apium prostratum</i> subsp. <i>prostratum</i>	Sea Celery							*
<i>Centella asiatica</i>	Indian Pennywort						*	*
<i>Platysace lanceolata</i>	Native Parsnip						*	*
<i>Xanthosia pilosa</i>	Woolly Xanthosia						*	*
<b>Apocynaceae</b>								
<i>*Gomphocarpus fruticosus</i>	Narrow-leaved Cottonbush						*	*
<i>Marsdenia rostrata</i>	Common Milk Vine				W		*	*
<i>Parsonsia straminea</i> var. <i>straminea</i>	Common Silkpod				W?		*	*
<b>Araliaceae</b>								
<i>*Hydrocotyle bonariensis</i>	Kurnell Curse						*	*
<i>Hydrocotyle tripartita</i>	Penny-weed							*
<i>Polyscias sambucifolia</i>	Elderberry Panax							*
<i>Trachymene incisa</i> subsp. <i>incisa</i>	Wild Parsnip						*	*
<b>Asteraceae</b>								
<i>*Ambrosia artemisiifolia</i>	Annual Ragweed						*	*
<i>*Bidens pilosa</i>	Cobblers Pegs						*	*
<i>Cassinia aculeata</i>	Common Cassinia						*	*
<i>*Chrysanthemoides monilifera</i> subsp. <i>rotundata</i>	Bitou Bush						*	*
<i>*Conyza bonariensis</i>	Flax-leaved Fleabane						*	*
<i>*Conyza parva</i>	Whorled Fleabane						*	*
<i>*Coreopsis lanceolata</i>	Coreopsis						*	*
<i>*Gamochaeta coarctata</i> syn. <i>Gamochaeta spicata</i>	Spiked Cudweed						*	*
<i>*Hypochaeris radicata</i>	Catsear, Flatweed						*	*

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<i>*Senecio madagascariensis</i>	Fireweed						*	*
<i>*Sonchus oleraceus</i>	Common Sow Thistle						*	*
<b>Bignoniaceae</b>								
<i>Pandorea pandorana</i>	Wonga-wonga Vine						*	*
<b>Campanulaceae</b>								
<i>Lobelia alata</i>								*
<i>Lobelia purpurascens</i>	White Root							*
<b>Cassythaceae</b>								
<i>Cassytha pubescens</i>	Common Devils Twine						*	*
<b>Casuarinaceae</b>								
<i>Allocasuarina littoralis</i>	Black She-oak						*	*
<i>Casuarina glauca</i>	Swamp She-oak						*	*
<b>Chenopodiaceae</b>								
<i>Sarcocornia quinqueflora</i>	Samphire							*
<i>Suaeda australis</i>	Austral Seablite							*
<b>Convolvulaceae</b>								
<i>Dichondra repens</i>	Kidney Weed							*
<i>Polymeria calycina</i>	Swamp Bindweed							*
<b>Cunoniaceae</b>								
<i>Ceratopetalum gummiferum</i>	New South Wales Christmas Bush						*	*
<b>Dilleniaceae</b>								
<i>Hibbertia dentata</i>	Twining Guinea Flower							*
<i>Hibbertia fasciculata</i>							*	*



SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAII	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<i>Hibbertia linearis</i>	Guinea Flower						*	*
<i>Hibbertia scandens</i>	Climbing Guinea Flower						*	*
<b>Droseraceae</b>								
<i>Drosera</i> sp.	Sundew						*	*
<b>Elaeocarpaceae</b>								
<i>Elaeocarpus reticulatus</i>	Blueberry Ash							*
<i>Tetratheca thymifolia</i>	Thyme Pink-bells						*	*
<b>Ericaceae formerly Epacridaceae</b>								
<i>Brachyloma daphnoides</i> subsp. <i>daphnoides</i>	Daphne Heath						*	*
<i>Epacris pulchella</i>	NSW Coral Heath						*	*
<i>Leucopogon ericoides</i>	Bearded Heath						*	*
<i>Leucopogon lanceolatus</i>	Lance Beard-heath						*	*
<i>Leucopogon margarodes</i>							*	*
<i>Leucopogon parviflorus</i>	Coastal Beard-heath						*	*
<i>Leucopogon virgatus</i>							*	*
<i>Monotoca elliptica</i>	Tree Broom-heath						*	*
<i>Styphelia viridis</i>	Green Five-corners						*	*
<i>Woolfsia pungens</i>	Snow Wreath						*	*
<b>Euphorbiaceae</b>								
<i>Ricinocarpus pinifolius</i>	Wedding Bush						*	*
<b>Fabaceae Subfamily (Faboideae)</b>								
<i>Aotus ericoides</i>	Heath Aotus						*	*
<i>Bossiaea heterophylla</i>	Variable Bossiaea						*	*
<i>Bossiaea rhombifolia</i>							*	*
<i>Desmodium varians</i>	Slender Tick-trefoil						*	*

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<i>Dillwynia retorta</i> subsp. <i>retorta</i>	Heathy Parrot Pea						*	*
<i>Glycine clandestina</i> subsp. <i>complex</i>	Love Creeper						*	*
<i>Gompholobium latifolium</i>	Giant Wedge Pea						*	*
<i>Hardenbergia violacea</i>	False Sarsaparilla						*	*
<i>Indigofera australis</i>	Austral Indigo						*	*
<i>Kennedia rubicunda</i>	Dusky Coral Pea						*	*
<i>Platylobium formosum</i>	Handsome Flat-pea						*	*
* <i>Trifolium campestre</i>	Hop Clover						*	*
* <i>Trifolium repens</i>	White Clover						*	*
<b>Fabaceae (Subfamily Mimosoideae)</b>								
<i>Acacia implexa</i>	Hickory							*
<i>Acacia irrorata</i> subsp. <i>irrorata</i>	Green Wattle						*	*
<i>Acacia longifolia</i> subsp. <i>longifolia</i>	Sydney Golden Wattle						*	*
<i>Acacia suaveolens</i>	Sweet-scented Wattle						*	*
<i>Acacia ulicifolia</i>	Prickly Moses						*	*
<b>Gentianaceae</b>								
* <i>Cenaurium erythraea</i>	Common Centaury						*	*
<b>Goodeniaceae</b>								
<i>Scaevola ramosissima</i>	Snake Flower						*	*
<b>Haloragaceae</b>								
<i>Gonocarpus micranthus</i> subsp. <i>micranthus</i>	Creeping Raspswort							*
<i>Gonocarpus teucrioides</i>	Germander Raspswort						*	*
<b>Hypericaceae</b>								
<i>Hypericum gramineum</i>	Native St John's Wort						*	*

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<b>Lauraceae</b>								
* <i>Cinnamomum camphora</i>	Camphor Laurel							
<b>Linaceae</b>								
* <i>Linum trigynum</i>	French Flax						*	*
<b>Loranthaceae</b>								
<i>Dendrophthoe vitellina</i>	Apostle Mistletoe						*	*
<b>Malvaceae</b>								
* <i>Modiola carliniana</i>	Red-flowered Mallow						*	*
* <i>Sida rhombifolia</i>	Paddys Lucerne							
<b>Menispermaceae</b>								
<i>Stephania japonica</i> var. <i>japonica</i>	Snake Vine						*	*
<b>Myrtaceae</b>								
<i>Angophora costata</i>	Smooth-barked Apple						*	*
<i>Callistemon salignus</i>	Willow Bottlebrush							*
<i>Corymbia gummifera</i>	Red Bloodwood						*	*
<i>Eucalyptus haemastoma</i>	Scribbly Gum						*	*
<i>Eucalyptus pilularis</i> ssp. <i>pilularis</i>	Blackbutt						*	*
<i>Eucalyptus piperita</i>	Sydney Peppermint						*	*
<i>Eucalyptus robusta</i>	Swamp Mahogany						*	*
<i>Gaudium laevigatum</i> syn. <i>Leptospermum laevigatum</i>	Coastal Tea-tree						*	*
<i>Gaudium trinervium</i> syn <i>Leptospermum trinervium</i>	Flaky-barked Tea-tree						*	*
<i>Leptospermum juniperinum</i>	Prickly Tea-tree							*
<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark						*	*

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<b>Oleaceae</b>								
<i>Notelaea longifolia</i>	Mock Olive						*	*
<b>Onagraceae</b>								
* <i>Oenothera</i> sp.							*	*
<b>Oxalidaceae</b>								
<i>Oxalis perennans</i>	-						*	*
<b>Phyllanthaceae</b>								
<i>Breynia oblongifolia</i>	Coffee Bush						*	*
<i>Glochidion ferdinandi</i> var. <i>ferdinandi</i>	Cheese Tree						*	*
<i>Omalanthus populifolius</i>	Bleeding Heart							*
<i>Phyllanthus hirtellus</i>	Thyme Spurge						*	*
<i>Poranthera ericifolia</i>							*	*
<i>Poranthera microphylla</i>							*	*
<b>Pittosporaceae</b>								
<i>Billardiera scandens</i>	Apple Dumplings						*	*
<i>Pittosporum revolutum</i>	Rough-fruit Pittosporum						*	*
<i>Pittosporum undulatum</i>	Sweet Pittosporum						*	*
<b>Plantaginaceae</b>								
* <i>Plantago lanceolata</i>	Plantain						*	*
<b>Polygalaceae</b>								
<i>Comesperma ericinum</i>	Matchheads						*	*
<b>Polygonaceae</b>								
<i>Persicaria decipens</i>	Slender Knotweed							*
<b>Primulaceae</b>								



SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<i>*Lysimachia arvensis</i> syn. <i>Anagallis arvensis</i>	Scarlet Pimpernel						*	*
<b>Proteaceae</b>								
<i>Banksia integrifolia</i>	Silver Banksia						*	*
<i>Banksia serrata</i>	Old Man Banksia						*	*
<i>Lomatia silaifolia</i>	Crinkle Bush						*	*
<i>Persoonia lanceolata</i>	Lance Leaf Geebung						*	*
<i>Persoonia levis</i>	Broad-leaved Geebung						*	*
<b>Ranunculaceae</b>								
<i>Clematis aristida</i>	Old Man's Beard						*	*
<b>Rubiaceae</b>								
<i>Opercularia diphylla</i>	Stinkweed						*	*
<i>Pomax umbellata</i>	Pomax						*	*
<i>*Richardia humistrata</i>							*	*
<b>Rutaceae</b>								
<i>Eriostemon australasius</i>	Pink Wax Flower						*	*
<i>Nematolepis squamea</i>	Satinwood						*	*
<i>Zieria smithii</i>	Sandfly Zieria						*	*
<b>Santalaceae</b>								
<i>Exocarpus cupressiformis</i>	Cherry Ballart						*	*
<i>Leptomeria acida</i>	Sour Currant Bush						*	*
<b>Sapindaceae</b>								
<i>Dodonaea triquetra</i>	Hop Bush						*	*
<b>Scrophulariaceae</b>								
<i>Myoporum acuminatum</i>	Boobialla							*

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	SAIL	REGIONALLY SIGNIFICANT	BIOSECURITY ACT 2015	SUBJECT LAND	STUDY AREA
<i>*Verbascum virgatum</i>	Twiggy Mullein						*	*
<b>Solanaceae</b>								
<i>*Solanum nigrum</i>	Blackberry Nightshade						*	*
<b>Thymelaeaceae</b>								
<i>Pimelea linifolia</i>	Rice Flower						*	*
<b>Verbenaceae</b>								
<i>*Lantana camara</i>	Lantana						*	*
<i>*Verbena bonariensis</i>	Purple Top						*	*
<b>Viscaceae</b>								
<i>Notothixos subaureus</i>	Golden Mistletoe				W		*	*
<b>Vitaceae</b>								
<i>Cissus hypoglauca</i>	Native Grape							*

## Appendix G: Fauna Survey Results

### **Amphibian Surveys**

One amphibian species; *Crinia signifera* (Common Eastern Froglet) was heard calling outside the subject land a short distance to the far north-west.

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

### **Reptile Surveys**

Five species of reptile were identified within the study area during targeted surveys (active searches and pitfall trapping) and incidental surveys: *Morelia spilota spilota* (Diamond Python), *Varanus varius* (Lace Monitor), *Lampropholis delicata* (Grass Skink), *Anomalopus swansoni* (Swanson's Legless Lizard) and *Lialis burtonis* (Burton's Legless Lizard).

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

### **Diurnal Avifauna Surveys**

An array of avifauna species was found to be present within the various habitats.

Within the Open Forest areas avifauna species commonly encountered included *Rhipidura fuliginosa* (Grey Fantail), *Cormobates leucophaea* (White-throated Treecreeper), *Lichenostomus chrysops* (Yellow-faced Honeyeater), *Philemon corniculatus* (Noisy Miner), *Sericornis frontalis* (White-browed Scrubwren), *Philemon corniculatus* (Noisy Friarbird), *Meliphaga lewinii* (Lewin's Honeyeater), *Platycercus eximius* (Eastern Rosella) and *Todiramphus sancta* (Sacred Kingfisher) and *Acanthiza pusilla* (Brown Thornbill).

Common species observed within the open area of habitat were *Vanellus miles* (Masked Lapwing) and *Cracticus tibicen* (Australian Magpie). A pair of *V. miles* were found to have nested and had young in late July 2024.

A small number of *Glossopsitta pusilla* (Little Lorikeet) specimens were observed moving through the study area on two occasions. *Glossopsitta pusilla* is listed as vulnerable under the BC Act (2016).

Birds of prey recorded included *Haliastur sphenurus* (Whistling Kite) and *Haliaeetus leucogaster* (White-breasted Sea-Eagle). The state and nationally threatened *Haliaeetus leucogaster* was observed flying over the western portion of the study area on a number of occasions. No large nests consistent with this species was found within the subject land or within close proximity.

The threatened *Ninox strenua* (Powerful Owl) was heard calling well north of the subject land on 18 May 2024 during a targeted threatened owl survey. Calls from the Powerful Owl were also detected incidentally by Eco Logical Australia (Eco Logical Australia, 2023) on the 12 and 13 December 2023 during an acoustic assessment within the study area targeting Koalas.

A total of three avifauna species *N. strenua*, *H. leucogaster* and *G. pusilla* are listed as vulnerable under the BC Act (2016). *Haliaeetus leucogaster* is also listed as vulnerable under the national EPBC Act (1999).

### **Mammal Surveys**

#### Terrestrial Mammals

A total of seven native terrestrial mammal species were recorded as a result of trapping, camera trapping, spotlighting and incidental surveys. These species were: *Tachyglossus aculeatus* (Echidna), *Antechinus stuartii* (Brown Antechinus), *Wallabia bicolor* (Swamp Wallaby), *Potorous tridactylus* (Long-nosed Potoroo), *Isodon macrourus* (Northern brown Bandicoot), *Rattus fuscipes* (Bush Rat) and *Canis familiaris dingo* (Dingo).

*Potorous tridactylus* (Long-nosed Potoroo) is listed as Vulnerable under both the BC Act 2016 and EPBC Act 1999.

The results of the terrestrial mammal trapping surveys are shown in Tables G1 and G2. The results of the ground camera trapping surveys are shown in Table G3. Photos from the ground camera survey are shown in Plates G1 to G4.

#### **Arboreal Mammals**

A total of three native terrestrial mammal species *Trichosurus vulpecula* (Common Brushtail Possum), *Petaurus norfolcensis* (Squirrel Glider) and *Antechinus stuartii* (Brown Antechinus) were recorded as a result of trapping, camera trapping, spotlighting, stagwatching and incidental surveys.

Acoustic songmeter surveys conducted within the study area by Eco Logical Australia in 2023 (Eco Logical Australia, 2023) also recorded calls of *Phascolarctos cinereus* (Koala).

*Petaurus norfolcensis* (Squirrel Glider) is listed as Vulnerable and *Phascolarctos cinereus* (Koala) Endangered under the BC Act 2016. The Koala is also listed as Endangered under the EPBC Act 1999.



The results of the arboreal camera trapping surveys are shown in Table G4. The results of the Arboreal Mammal Trapping surveys are shown in Tables G5. Photos of the arboreal camera trapping survey are shown in Plates G5-G11.

**Table G1: Small Terrestrial Mammal Trapping Results.**

DATE	TRAP NO	SPECIES	SEX
Trapping period 14 – 18 October 2019			
Tuesday 15/10/19	T2	<i>Antechinus stuartii</i> (Brown Antechinus)	Female (with young)
	T10	<i>A. stuartii</i>	Female (with young)
	T17	<i>A. stuartii</i>	Female (with young)
	T20	<i>A. stuartii</i>	Female (with young)
	T30	<i>A. stuartii</i>	Female (with young)
Wednesday 16/10/19	T12	<i>A. stuartii</i>	Female (with young)
	T21	<i>Rattus fuscipes</i> (Bush Rat)	
	T28	<i>A. stuartii</i>	Female (with young)
	T30	<i>A. stuartii</i>	Female (with young)
Thursday 17/10/19	T6	<i>A. stuartii</i>	Female (with young)
	T11	<i>A. stuartii</i>	Female (with young)
	T22	<i>R. fuscipes</i>	Male
	T28	<i>A. stuartii</i>	Female (with young)
Friday 18/10/19	T9	<i>A. stuartii</i>	Female (with young)
	T3	<i>R. fuscipes</i>	Male
	T9	<i>R. fuscipes</i>	Female
	T28	<i>A. stuartii</i>	Female (with young)
	T29	<i>A. stuartii</i>	Female (with young)

**Table G2: Medium Terrestrial Mammal Trapping Results.**

DATE	TRAP NO	SPECIES	SEX
Trapping period 14 – 18 October 2019			
Tuesday 15/10/19		No captures	
Wednesday 16/10/19		No captures	
Thursday 17/10/19	C3	<i>Varanus varius</i> (Lace Monitor)	
	C5	<i>V. varius</i>	
Friday 18/10/19		No captures	

**Table G3 Results of the Ground Camera Trapping Surveys**

Camera	G1	G2	G3	G4	G5	G6	G7
Date Set	15/05/2019	13/06/2019	6/08/2019	6/08/2019	6/08/2019	3/07/2024	3/07/2024
Date Retrieved	13/06/2019	6/08/2019	5/09/2019	16/08/2019	16/08/2019	07/08/2024	07/08/2024
Days	29	54	30	10	10	35	35
Species							
<i>Tachyglossus aculeatus</i> Echidna			X	X			
<i>Trichosurus vulpecula</i> Common Brushtail Possum						X	X
<i>Antechinus stuartii</i> Brown Antechinus			X	X		X	X
<i>Isodon macrourus</i> Northern brown Bandicoot			X	X			
<i>Potorous tridactylus</i> Long-nosed Potoroo				X			
<i>Wallabia bicolor</i> Swamp Wallaby				X	X		
<i>Canis familiaris dingo</i> Dingo		X		X	X	X	
<i>Canis familiaris familiaris</i> Dog	X	X					
<i>Rattus fuscipes</i> Bush Rat				X			
<i>Lepus capensis</i> European Hare						X	
<i>Alectura lathami</i> Bush Turkey						X	
<i>Eopsaltria australis</i>	X		X				

Camera	G1	G2	G3	G4	G5	G6	G7
Eastern Yellow Robin							
<i>Leucosarcia melanoleuca</i> Wonga Pigeon	X	X			X		
<i>Rhipidura albiscapa</i> Grey Fantail	X						
<i>Colluricincla harmonica</i> Grey Shrike Thrush		X					X
<i>Malurus cyaneus</i> Superb Fairy Wren			X				

**Table G4 Results of the Arboreal Camera Trapping Surveys**

Camera	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
<b>Date Set</b>	15/05/2019	13/06/2019	5/09/2019	14/06/2024	19/06/2024	19/06/2024	24/06/2024	3/07/2024	15/07/2024	15/07/2024
<b>Date Retrieved</b>	13/06/2019	6/08/2019	12/09/2019	30/07/2024	07/08/2024	24/06/2024	30/07/2024	30/07/2024	07/08/2024	07/08/2024
<b>Days</b>	29	54	7	54	54	41	5	36	35	23
<b>Species</b>										
<i>Petaurus norfolcensis</i> Squirrel Glider				X			X			
<i>Trichosurus vulpecula</i> Common Brushtail Possum				X	X		X			
<i>Antechinus stuartii</i> Brown Antechinus	X	X	X	X	X	X	X	X	X	X
<i>Canis familiaris dingo</i> Dingo				X						
<i>Alectura lathami</i> Bush Turkey				X						
<i>Cormobates leucophaea</i> White-throated Treecreeper						X	X			X

Camera	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
<i>Cracticus torquatus</i> Grey Butcherbird					X				X	



**Table G5: Arboreal Mammal Trapping Results.**

DATE	TRAP NO	SPECIES	SEX
Trapping period 14 – 18 October 2019			
Tuesday 15/10/19		No captures	
Wednesday 16/10/19		No captures	
Thursday 17/10/19	A5	<i>Antechinus stuartii</i> (Brown Antechinus)	Female (with young)
Friday 18/10/19		No captures	



**Plate G1** *Petaurus norfolcensis* (Squirrel Glider) observed on Camera No. A5.



Plate G2 *Petaurus norfolcensis* (Squirrel Glider) observed on Camera No. A5.



Plate G3 *Petaurus norfolcensis* (Squirrel Glider) observed on Camera No. A7.



Plate G4 *Antechinus stuartii* (Brown Antechinus) observed on Camera No. A8.



Plate G5 *Potorous tridactylus* (Long-nosed Potoroo) Camera No. G4.





Plate G6 *Potorous tridactylus* (Long-nosed Potoroo) Camera No. G4.



Plate G7 *Isoodon macrourus* (Northern brown Bandicoot) Camera No. G4.





Plate G8 *Canis familiaris dingo* (Dingo) observed on Camera No. G6.



Plate G9 *Wallabia bicolor* (Swamp Wallaby) observed on Camera No. G4.





Plate G10 *Trichosurus vulpecula* (Common Brushtail Possum) observed on Camera No. G6.

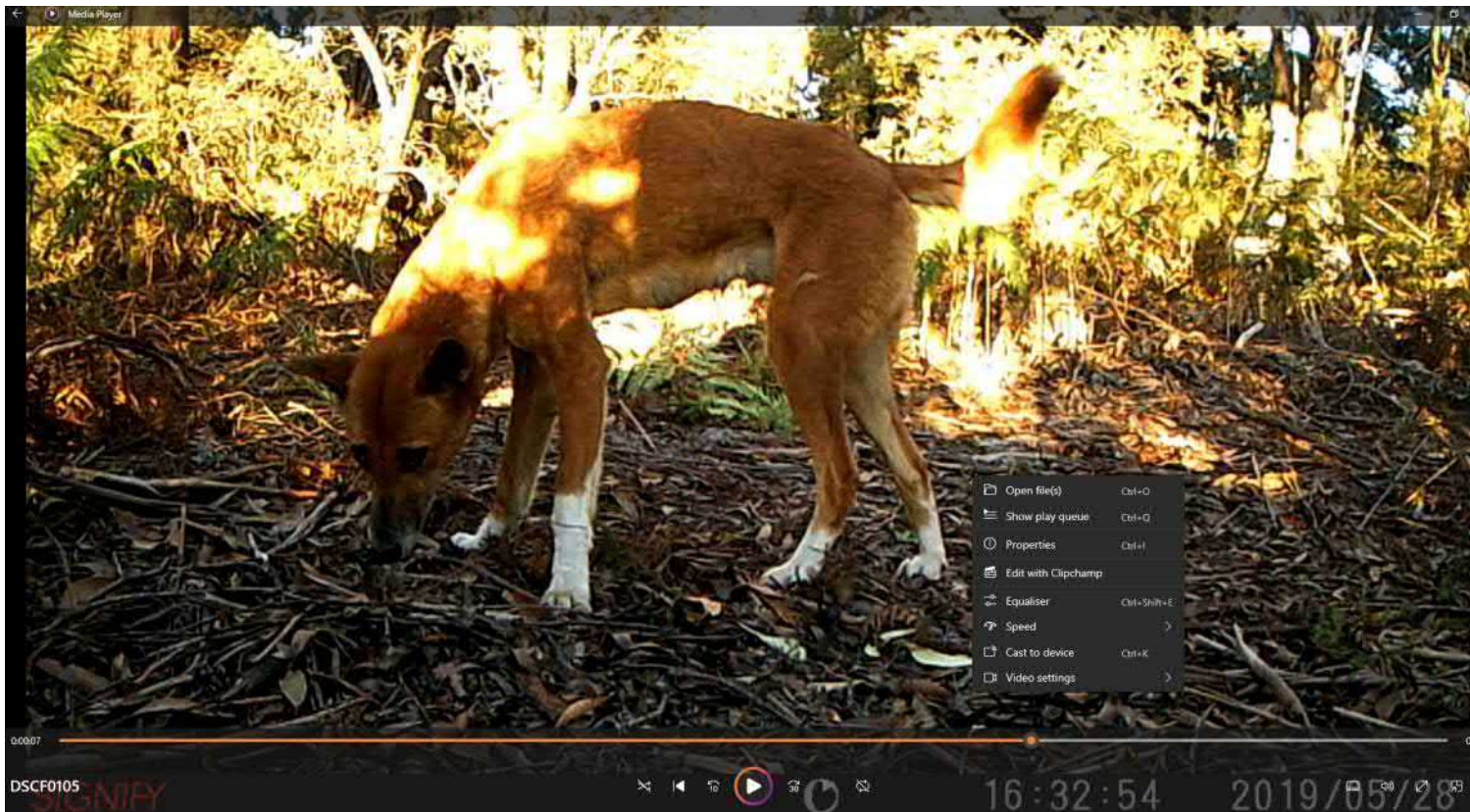


Plate G11 *Canis familiaris dingo* (Dingo) observed on Camera No. G1.

### *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 subject land and study area.

### Methodology

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. The assessment was undertaken within four random sites of the study area on 8 & 11 February 2021.

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.
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.

Five-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.

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.

The 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 is shown in Table G6.

**Table G6. Categorisation of Koala activity**

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 $\leq 46.72\%$	$> 46.72\%$

### Results

Survey results have been presented in Tables G7, G8, G9 and G10. The location of the SAT assessments is shown in Figure G1. No Koala scats or evidence of koalas was observed. Given a sample of 120 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.

**Table G7: Results of the Spot Assessment Technique (SAT) #1 E-423373, N-6387043**

Tree No	Tree species	Easting	Northing	DBH (m)	Result
1	<i>Eucalyptus microcorys</i> Tallowwood	423373	6387043	0.20	No Koala Pellets observed
2	<i>E. microcorys</i>	423374	6387042	0.20	No Koala Pellets observed
3	<i>Corymbia gummifera</i> Red Bloodwood	423379	6387042	0.60	No Koala Pellets observed
4	<i>C. gummifera</i>	423379	6387035	0.60	No Koala Pellets observed
5	<i>Melaleuca elliptica</i> Granite Bottlebrush	423380	6387035	0.10	No Koala Pellets observed
6	<i>C. gummifera</i>	423378	6387033	0.60	No Koala Pellets observed
7	<i>C. gummifera</i>	423371	6387028	0.50	No Koala Pellets observed
8	<i>C. gummifera</i>	423370	6387034	0.30	No Koala Pellets observed
9	<i>C. gummifera</i>	423373	6387027	0.35	No Koala Pellets observed
10	<i>C. gummifera</i>	423364	6387031	0.60	No Koala Pellets observed
11	<i>C. gummifera</i>	423361	6387040	0.15, 10	No Koala Pellets observed
12	<i>E. microcorys</i>	423365	6387041	0.10	No Koala Pellets observed
13	<i>E. microcorys</i>	423366	6387040	0.20	No Koala Pellets observed
14	<i>Eucalyptus pilularis</i> Blackbutt	423368	6387043	0.75	No Koala Pellets observed
15	<i>E. pilularis</i>	423362	6387044	0.45	No Koala Pellets observed
16	<i>E. pilularis</i>	423368	6387044	0.65	No Koala Pellets observed
17	<i>C. gummifera</i>	423371	6387043	0.60	No Koala Pellets observed
18	<i>C. gummifera</i>	423374	6387048	0.45	No Koala Pellets observed
19	<i>E. pilularis</i>	423374	6387054	0.20	No Koala Pellets observed
20	<i>E. microcorys</i>	423375	6387061	0.20	No Koala Pellets observed
21	<i>E. microcorys</i>	423376	6387061	0.15	No Koala Pellets observed
22	<i>E. microcorys</i>	423376	6387062	0.15	No Koala Pellets observed
23	<i>Banksia serrata</i> (Old Man Banksia)	423378	6387057	0.15	No Koala Pellets observed
24	<i>C. gummifera</i>	423382	6387058	0.55	No Koala Pellets observed
25	<i>B. serrata</i>	423382	6387057	0.20	No Koala Pellets observed
26	<i>C. gummifera</i>	423382	6387054	0.50	No Koala Pellets observed
27	<i>E. microcorys</i>	423380	6387051	0.20	No Koala Pellets observed



Tree No	Tree species	Easting	Northing	DBH (m)	Result
28	<i>E. microcorys</i>	423380	6387053	0.20	No Koala Pellets observed
29	<i>B. serrata</i>	423382	6387053	0.15	No Koala Pellets observed
30	<i>C. gummifera</i>	423385	6387046	0.25	No Koala Pellets observed

**Table G8: Results of the Spot Assessment Technique (SAT) #2 survey E-423331, N-6386980**

Tree No	Tree species	Easting	Northing	DBH (m)	Result
1	<i>Eucalyptus microcorys</i> Tallowwood	423331	6386980	0.20	No Koala Pellets observed
2	<i>E. microcorys</i>	423331	6386979	0.25	No Koala Pellets observed
3	<i>E. microcorys</i>	423332	6386979	0.25	No Koala Pellets observed
4	<i>E. microcorys</i>	423330	6386979	0.15	No Koala Pellets observed
5	<i>Corymbia gummifera</i> Red Bloodwood	423330	6386980	0.40	No Koala Pellets observed
6	<i>C. gummifera</i>	423326	6386984	0.30	No Koala Pellets observed
7	<i>Eucalyptus pilularis</i> Blackbutt	423317	6386986	0.20	No Koala Pellets observed
8	<i>E. pilularis</i>	423317	6386991	0.30	No Koala Pellets observed
9	<i>C. gummifera</i>	423323	6386990	0.35	No Koala Pellets observed
10	<i>C. gummifera</i>	423319	6386996	0.70	No Koala Pellets observed
11	<i>E. pilularis</i>	423323	6386997	0.35	No Koala Pellets observed
12	<i>E. pilularis</i>	423328	6386991	0.40	No Koala Pellets observed
13	<i>C. gummifera</i>	423331	6386991	0.20	No Koala Pellets observed
14	<i>C. gummifera</i>	423333	6386992	0.20	No Koala Pellets observed
15	<i>C. gummifera</i>	423335	6386993	0.25	No Koala Pellets observed
16	<i>E. pilularis</i>	423345	6386995	0.35, 0.30	No Koala Pellets observed
17	<i>E. pilularis</i>	423345	6386994	0.25	No Koala Pellets observed
18	<i>C. gummifera</i>	423350	6386987	0.60	No Koala Pellets observed
19	<i>C. gummifera</i>	423347	6386986	0.40	No Koala Pellets observed
20	<i>C. gummifera</i>	423339	6386984	0.50	No Koala Pellets observed
21	<i>E. pilularis</i>	423337	6386983	0.20	No Koala Pellets observed
22	<i>C. gummifera</i>	423342	6386976	0.55	No Koala Pellets observed

Tree No	Tree species	Easting	Northing	DBH (m)	Result
23	<i>C. gummifera</i>	423344	6386975	0.50	No Koala Pellets observed
24	<i>C. gummifera</i>	423342	6386974	0.25	No Koala Pellets observed
25	<i>C. gummifera</i>	423340	6386972	0.40	No Koala Pellets observed
26	<i>C. gummifera</i>	423337	6386967	0.25	No Koala Pellets observed
27	<i>C. gummifera</i>	423339	6386968	0.30	No Koala Pellets observed
28	<i>C. gummifera</i>	423332	6386966	0.10	No Koala Pellets observed
29	<i>C. gummifera</i>	423328	6386967	0.30	No Koala Pellets observed
30	<i>E. pilularis</i>	423321	6386973	0.45	No Koala Pellets observed

**Table G9: Results of the Spot Assessment Technique (SAT) #3 survey E-423268, N-6386871**

Tree No	Tree species	Easting	Northing	DBH (m)	Result
1	<i>Eucalyptus pilularis</i> Blackbutt	423268	6386871	0.50	No Koala Pellets observed
2	<i>Corymbia gummifera</i> Red Bloodwood	423270	6386868	0.50, 0.20, 0.20	No Koala Pellets observed
3	<i>C. gummifera</i>	423268	6386861	0.20	No Koala Pellets observed
4	<i>E. pilularis</i>	423265	6386860	0.15	No Koala Pellets observed
5	<i>C. gummifera</i>	423261	6386866	0.25	No Koala Pellets observed
6	<i>C. gummifera</i>	423260	6386865	0.30	No Koala Pellets observed
7	<i>Nematolepis squamea</i> Satinwood	423263	6386870	0.10	No Koala Pellets observed
8	<i>E. pilularis</i>	423263	6386872	0.10	No Koala Pellets observed
9	<i>E. pilularis</i>	423262	6386874	0.70	No Koala Pellets observed
10	<i>E. pilularis</i>	423266	6386880	0.15	No Koala Pellets observed
11	<i>C. gummifera</i>	423266	6386881	0.25	No Koala Pellets observed
12	<i>E. pilularis</i>	423266	6386886	0.20	No Koala Pellets observed
13	<i>E. pilularis</i>	423275	6386877	0.10	No Koala Pellets observed
14	<i>E. pilularis</i>	423276	6386877	0.15	No Koala Pellets observed
15	<i>C. gummifera</i>	423282	6386872	0.20	No Koala Pellets observed
16	<i>C. gummifera</i>	423284	6386872	0.20	No Koala Pellets observed
17	<i>C. gummifera</i>	423275	6386866	0.35	No Koala Pellets observed

Tree No	Tree species	Easting	Northing	DBH (m)	Result
18	<i>C. gummifera</i>	423277	6386864	0.25	No Koala Pellets observed
19	<i>E. pilularis</i>	423281	6386863	0.35	No Koala Pellets observed
20	<i>C. gummifera</i>	423281	6386862	0.25	No Koala Pellets observed
21	<i>C. gummifera</i>	423274	6386856	0.40	No Koala Pellets observed
22	<i>C. gummifera</i>	423277	6386855	0.90	No Koala Pellets observed
23	<i>C. gummifera</i>	423270	6386852	0.25	No Koala Pellets observed
24	<i>C. gummifera</i>	423264	6386853	0.30	No Koala Pellets observed
25	<i>C. gummifera</i>	423265	6386853	0.30	No Koala Pellets observed
26	<i>E. pilularis</i>	423264	6386850	0.45	No Koala Pellets observed
27	<i>C. gummifera</i>	423263	6386851	0.35	No Koala Pellets observed
28	<i>C. gummifera</i>	423263	6386850	0.25	No Koala Pellets observed
29	<i>E. pilularis</i>	423259	6386850	0.35	No Koala Pellets observed
30	<i>C. gummifera</i>	423258	6386851	0.30, 0.35	No Koala Pellets observed

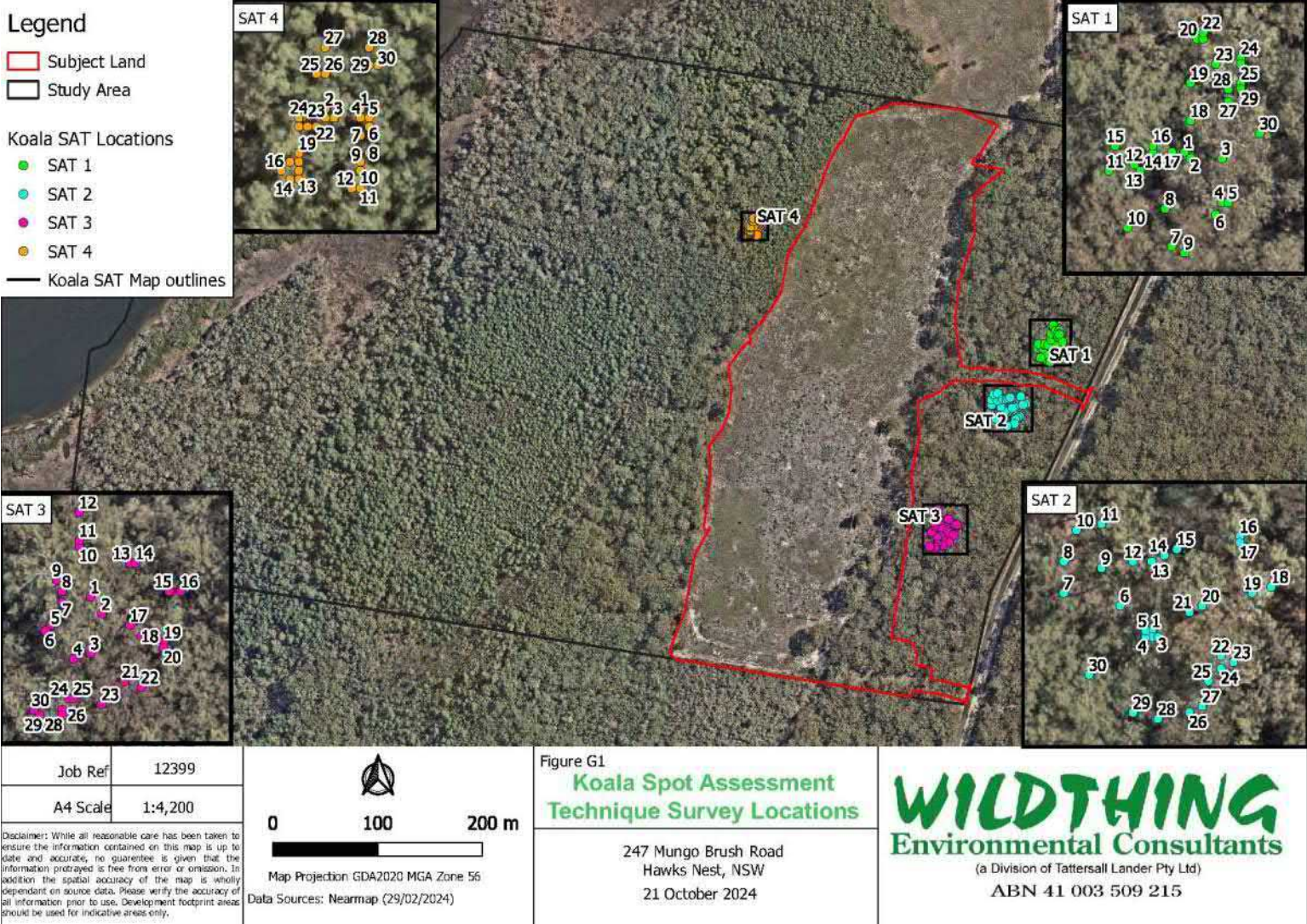
**Table G10: Results of the Spot Assessment Technique (SAT) #4 survey E-423094, N-6387157**

Tree No	Tree species	Easting	Northing	DBH (m)	Result
1	<i>Eucalyptus robusta</i> Swamp Mahogany	423094	6387157	0.40	No Koala Pellets observed
2	<i>E. robusta</i>	423090	6387157	0.20	No Koala Pellets observed
3	<i>E. robusta</i>	423091	6387156	0.25	No Koala Pellets observed
4	<i>E. robusta</i>	423094	6387156	0.35	No Koala Pellets observed
5	<i>E. robusta</i>	423095	6387156	0.30	No Koala Pellets observed
6	<i>E. robusta</i>	423095	6387155	0.30	No Koala Pellets observed
7	<i>Melaleuca quinquenervia</i> Broad-leaved Paperbark	423094	6387154	0.25	No Koala Pellets observed
8	<i>M. quinquenervia</i>	423095	6387152	0.25	No Koala Pellets observed
9	<i>E. robusta</i>	423094	6387151	0.35	No Koala Pellets observed
10	<i>M. quinquenervia</i>	423094	6387150	0.35	No Koala Pellets observed
11	<i>Casuarina glauca</i> Swamp she-oak	423094	6387148	0.20	No Koala Pellets observed
12	<i>Cinnamomum camphora</i>	423093	6387148	0.15	No Koala Pellets observed

Tree No	Tree species	Easting	Northing	DBH (m)	Result
	Camphor Laurel				
13	<i>E. robusta</i>	423087	6387149	0.10	No Koala Pellets observed
14	<i>M. quinquenervia</i>	423086	6387149	0.10	No Koala Pellets observed
15	<i>C. camphora</i>	423087	6387150	0.15	No Koala Pellets observed
16	<i>M. quinquenervia</i>	423085	6387150	1.00	No Koala Pellets observed
17	<i>E. robusta</i>	423086	6387151	0.10	No Koala Pellets observed
18	<i>M. quinquenervia</i>	423087	6387151	0.20	No Koala Pellets observed
19	<i>M. quinquenervia</i>	423087	6387152	0.20	No Koala Pellets observed
20	<i>E. robusta</i>	423087	6387155	0.40	No Koala Pellets observed
21	<i>M. quinquenervia</i>	423088	6387155	0.30	No Koala Pellets observed
22	<i>M. quinquenervia</i>	423089	6387155	0.15	No Koala Pellets observed
23	<i>E. carnea</i>	423090	6387156	0.20	No Koala Pellets observed
24	<i>E. carnea</i>	423087	6387156	0.20	No Koala Pellets observed
25	<i>M. quinquenervia</i>	423089	6387161	0.10	No Koala Pellets observed
26	<i>E. robusta</i>	423090	6387161	0.35	No Koala Pellets observed
27	<i>E. robusta</i>	423090	6387164	1.25	No Koala Pellets observed
28	<i>M. quinquenervia</i>	423095	6387164	0.30	No Koala Pellets observed
29	<i>C. camphora</i>	423095	6387162	0.15	No Koala Pellets observed
30	<i>M. quinquenervia</i>	423096	6387162	0.20	No Koala Pellets observed



Figure G1 Koala Spot Assessment Technique Locations



### ***Microchiropteran Bat Survey***

#### Microchiropteran Bat Survey (Harp Trapping)

During the harp trapping component of the survey one species of microchiropteran bat; *Nyctophilus gouldi* (Gould's Long-eared Bat) was captured. The results of the harp trapping survey are shown in Table G11.

**Table G11: Microchiropteran Harp Trapping Results**

DATE	TRAP NO	SPECIES	SEX
Trapping period 16 – 18 October 2019			
Wednesday 16/10/19	H1	No captures	
	H2	No captures	
Thursday 17/10/19	H1	<i>Nyctophilus gouldi</i>	Female
	H1	<i>N. gouldi</i>	Female
	H1	<i>N. gouldi</i>	Female
	H2	No captures	

#### Microchiropteran Bat Call Survey

The following species were identified from Anabat recordings:

- *Austronomus australis* (White-striped free-tailed bat)
- *Chalinolobus gouldii* (Gould's wattled bat)
- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle) (likely recorded)
- *Miniopterus australis* (Little Bent-winged Bat)
- *Nyctophilus* sp. (*geoffroyii* or *gouldi*)
- *Vespadelus* sp. Likely *Vespadelus vulturnus* (Little Forest Bat).

*Falsistrellus tasmaniensis* (Eastern False Pipistrelle) and *Miniopterus australis* (Little Bent-winged Bat), are listed as Vulnerable under the BC Act.

### ***Megachiropteran Survey***

Numerous specimens of *Pteropus poliocephalus* (Grey-headed Flying-Fox) were observed to be foraging on flowering specimens of *Eucalyptus robusta* (Swamp Mahogany) during spotlighting in May 2019 and June 2024. These Megachiropteran bats were likely originating from the seasonal camp near the Ibis Avenue and Kingfisher Avenue intersection at Hawks Nest approximately 1.5km to the south of the subject land (MidCoast Council, 2021).

The Grey-headed Flying-fox is listed as Vulnerable under both the BC Act 2016 and EPBC Act 1999..

## 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)(9<sup>th</sup> 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 ("\*").

#### Record Source

Wildthing Environmental Consultants - Wildthing

Eco Logical Australia (2023). Eco Logical

BioNet Atlas - (DPI, 2024) BioNet

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**

#### **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	RECORD SOURCE	OBSERVATION TYPE
<b>Phylum - Chordata</b>					
<b>Subphylum - Vertebrata</b>					
<b>Class Amphibia - Amphibians</b>					
<b>Order Salientia - Frogs</b>					
<b>Family Myobatrachidae - 'Southern Frogs'</b>					
<i>Crinia signifera</i>	Common Eastern Froglet			Wildthing	
<b>Class Reptilia - Reptiles</b>					
<b>Order Squamata – Lizards and Snakes</b>					
<b>Suborder Sauria - Lizards</b>					
<b>Family Pygopodidae – Legless Lizards</b>					
<i>Lialis burtonis</i>	Burton's Snake-lizard			Wildthing	
<b>Family Varanidae - Monitors</b>					
<i>Varanus varius</i>	Lace Monitor				
<b>Family Scinidae - Skinks</b>					
<i>Anomalopus swansoni</i>	Swanson's Legless Lizard			Wildthing	
<i>Lampropholis delicata</i>	Grass Skink			Wildthing	
<b>Suborder Serpentes - Snakes</b>					
<b>Family Boidae - Pythons</b>					
<i>Morelia spilota</i>	Carpet (Diamond) Python			Wildthing	



SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	RECORD SOURCE	OBSERVATION TYPE
<b>Class Aves - Birds</b>					
<b>Family Megapodiidae (Mound Builders)</b>					
<i>Alectura lathami</i>	Australian Brush-Turkey			Wildthing	O, Q
<b>Family Phasianidae</b>					
<i>Coturnix ypsilophora</i>	Brown Quail			Wildthing (Eco Logical, 2023)	O, AR
<b>Family Columbidae - Pigeons, Doves</b>					
<i>Geopelia humeralis</i>	Bar-shouldered Dove			Wildthing	OW
<i>Geopelia striata</i>	Peaceful Dove			Wildthing	OW
<i>Leucosarcia melanoleuca</i>	Wonga Pigeon			Wildthing	W
<b>Family Podargidae - Frogmouths</b>					
<i>Podargus strigoides</i>	Tawny Frogmouth			Wildthing	
<b>Family Caprimulgidae - Nightjars</b>					
<i>Eurostopodus mystacalis</i>	White-throated Nightjar			Wildthing (Eco Logical, 2023)	
<b>Family Aegothelidae - Owlet Nightjars</b>					
<i>Aegotheles cristatus</i>	Australian Owlet Nightjar			(Eco Logical, 2023)	
<b>Family Accipitridae - Osprey, Hawks, Eagles and Harriers</b>					
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	V	Wildthing	OW
<i>Haliastur sphenurus</i>	Whistling Kite			Wildthing	OW
<b>Family Charadriidae Plover, Dotterels,</b>					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	RECORD SOURCE	OBSERVATION TYPE
<b>Lapwings</b>					
<i>Vanellus miles</i>	Masked Lapwing			Wildthing	OW
<b>Family Cacatuidae - Cockatoos and Corellas</b>					
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo			Wildthing	OW
<i>Cacatua roseicapilla</i>	Galah			Wildthing	OW
<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo			Wildthing	OW
<b>Family Psittacidae - Parrots, Rosellas and Lorikeets</b>					
<i>Alisterus scapularis</i>	King Parrot			Wildthing	OW
<i>Platycercus eximius</i>	Eastern Rosella			Wildthing	OW
<i>Trichoglossus chlorolepidotus</i>	Scaly-breasted Lorikeet			Wildthing	OW
<i>Trichoglossus haematodus</i>	Rainbow Lorikeet			Wildthing	OW
<b>Family Cuculidae - Cuckoos</b>					
<i>Centropus phasianinus</i>	Pheasant Coucal			Wildthing	W
<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo			Wildthing	OW
<i>Eudynamis orientalis</i>	Common Koel			Wildthing	OW
<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo			Wildthing (Eco Logical, 2023)	OW
<b>Family Strigidae - Hawk-Owls</b>					
<i>Ninox novaeseelandiae</i>	Southern Boobook			Wildthing (Eco Logical, 2023)	AR
<b><i>Ninox strenua</i></b>	<b>Powerful Owl</b>	<b>V</b>		Wildthing (Eco Logical, 2023)	W AR
<b>Family Halcyonidae - Tree Kingfishers</b>					
<i>Dacelo novaeguineae</i>	Laughing Kookaburra			Wildthing	OW
<i>Todiramphus sanctus</i>	Sacred Kingfisher			Wildthing	OW

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	RECORD SOURCE	OBSERVATION TYPE
<b>Family Meropidae - Bee-eaters</b>					
<i>Merops ornatus</i>	Rainbow Bee-eater		M	Wildthing	OW
<b>Family Coraciidae - Rollers 'Dollarbirds</b>					
<i>Eurystomus orientalis</i>	Dollarbird			Wildthing	OW
<b>Family Climacteridae - Treecreepers</b>					
<i>Cormobates leucophaea</i>	White-throated Treecreeper			Wildthing	OW, Q
<b>Family Ptilonorhynchidae - Bowerbirds</b>					
<i>Ptilonorhynchus violaceus</i>	Satin Bowerbird			Wildthing	
<b>Family Maluridae</b>					
<i>Malurus cyaneus</i>	Superb Fairy-wren			Wildthing	OW
<b>Family Pardalotidae - Pardalotes, Gerygones, Scrubwrens, Heathwrens and Thornbills</b>					
<i>Acanthiza nana</i>	Yellow Thornbill			Wildthing	OW
<i>Acanthiza pusilla</i>	Brown Thornbill			Wildthing	OW
<i>Gerygone mouki</i>	Brown Gerygone			Wildthing	OW
<i>Gerygone olivacea</i>	White-throated Gerygone			Wildthing	OW
<i>Pardalotus punctatus</i>	Spotted Pardalote			Wildthing	OW
<i>Sericornis frontalis</i>	White-browed Scrubwren			Wildthing	OW
<b>Family Meliphagidae - Honeyeaters</b>					
<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill			Wildthing	OW
<i>Anthochaera chrysoptera</i>	Little Wattlebird			Wildthing	OW
<i>Caligavis chrysops</i>	Yellow-faced Honeyeater			Wildthing	OW
<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater			Wildthing	OW
<i>Manorina melanocephala</i>	Noisy Miner			Wildthing	OW
<i>Meliphaga lewinii</i>	Lewin's Honeyeater			Wildthing	OW

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	RECORD SOURCE	OBSERVATION TYPE
<i>Philemon corniculatus</i>	Noisy Friarbird			Wildthing	OW
<i>Phylidonyris niger</i>	White-cheeked Honeyeater			Wildthing	OW
<b>Family Petroicidae - Robins and Jacky Winter</b>					
<i>Eopsaltria australis</i>	Eastern Yellow Robin			Wildthing	OW, Q
<b>Family Pachycephalidae - Whistlers, Shrike-tit and Shrike-thrushes</b>					
<i>Colluricincla harmonica</i>	Grey Shrike-thrush			Wildthing	OW
<i>Pachycephala pectoralis</i>	Golden Whistler			Wildthing	OW
<b>Family Cinclosomatidae - Whipbird and Quail-thrushes</b>					
<i>Psophodes olivaceus</i>	Eastern Whipbird			Wildthing	W
<b>Family Monarchidae - Monarchs, Flycatchers and Magpie-Lark</b>					
<i>Myiagra inquieta</i>	Restless Flycatcher			Wildthing	OW
<i>Myiagra rubecula</i>	Leaden Flycatcher			Wildthing	OW
<i>Grallina cyanoleuca</i>	Magpie-lark			Wildthing	OW
<b>Family Rhipiduridae - Fantails</b>					
<i>Rhipidura albiscapa</i> syn. <i>Rhipidura fuliginosa</i>	Grey Fantail			Wildthing	OW
<i>Rhipidura leucophrys</i>	Willie Wagtail			Wildthing	OW
<b>Family Campephagidae - Cuckoo-shrikes and Trillers</b>					
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike			Wildthing	OW
<b>Family Hirundinidae - Swallows and Martins</b>					



SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	RECORD SOURCE	OBSERVATION TYPE
<i>Hirundo neoxena</i>	Welcome Swallow			Wildthing	OW
<b>Family Zosteropidae - White-eyes</b>					
<i>Zosterops lateralis</i>	Silvereye			Wildthing	OW
<b>Family Oriolidae</b>					
<i>Oriolus sagittatus</i>	Olive-backed Oriole			Wildthing	OW
<i>Sphecotheres vieilloti</i>	Australasian Figbird			Wildthing	OW
<b>Family Artamidae - Wood-swallows, Butcherbirds, Magpie and Currawongs</b>					
<i>Cracticus nigrogularis</i>	Pied Butcherbird			Wildthing	OW
<i>Cracticus tibicen</i> syn. <i>Gymnorhina tibicen</i>	Australian Magpie			Wildthing	OW
<i>Strepera graculina</i>	Pied Currawong			Wildthing	OW
<b>Family Corvidae - Crows, Raven</b>					
<i>Corvus coronoides</i>	Australian Raven			Wildthing	OW
<i>Corvus orru</i>	Torresian Crow			Wildthing	OW
<b>Family Estrildidae - Grassfinches</b>					
<i>Neochima temporalis</i>	Red-browed Finch			Wildthing	OW
<b>Class Mammalia - Mammals</b>					
<b>Subclass Prototheria - Monotremes</b>					
<b>Order Monotremata</b>					
<b>Family Tachyglossidae - Echidna</b>					
<i>Tachyglossus aculeatus</i>	Echidna			Wildthing	Q
<b>Subclass Marsupialia - Marsupials</b>					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	RECORD SOURCE	OBSERVATION TYPE
<b>Order Dasyuromorphia – Carnivorous Marsupials</b>					
<b>Family Dasyuridae - Dasyurids</b>					
<i>Antechinus stuarti</i>	Brown Antechinus			Wildthing	Q, T
<b>Order Peramelemorphia</b>					
<b>Family Peramelidae - Bandicoots</b>					
<i>Isodon macrourus</i>	Northern Brown Bandicoot			Wildthing	Q
<b>Order Diprotodontia</b>					
<b>Suborder Vombatiformes</b>					
<b>Family Phascolarctidae - Koala</b>					
<i>Phascolarctos cinereus</i>	Koala	E	E	Eco Logical BioNet	AR
<b>Suborder Phalangerida</b>					
<b>Superfamily - Petauroidea</b>					
<b>Family Petauridae</b>					
<i>Petaurus norfolcensis</i>	Squirrel Glider	V		Wildthing BioNet	Q
<b>Superfamily - Phalangoidea</b>					
<b>Family Phalangeridae - Brushtail Possums</b>					
<b>Superfamily - Macropodoidae</b>					
<b>Family Macropodidae - Kangaroos,</b>					

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	RECORD SOURCE	OBSERVATION TYPE
<b>Wallabies</b>					
<i>Wallabia bicolor</i>	Swamp Wallaby			Wildthing	Q, O
<b>Family Potoroidae</b>					
<i>Potorous tridactylus</i>	Long-nosed Potoroo	V	V	Wildthing	Q
<b>Subclass Eutheria - Eutherian Mammals</b>					
<b>Order Chiroptera</b>					
<b>Suborder Megachiroptera - Megabats</b>					
<b>Family Pteropodidae - Fruit Bats</b>					
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Wildthing	OW, AR
<b>Suborder Microchiroptera</b>					
<b>Family Molossidae - Freetail-bats</b>					
<i>Austronomus australis</i>	White-striped Freetail Bat			Wildthing	U, W
<b>Family Vespertilionidae - Plain-nosed Bats</b>					
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat			Wildthing	U
<i>Falsistrellus tasmaniensis</i>	<b>Eastern Falsistrelle</b>	V		Wildthing	U
<i>Miniopterus australis</i>	<b>Little Bentwing-bat</b>	V		Wildthing	U
<i>Nyctophilus gouldi</i>	Gould's Long-eared Bat			Wildthing	U, T
<i>Vespadelus vulturnus</i>	Little Forest Bat			Wildthing	U
<b>Order Rodentia</b>					
<b>Family Muridae - Rodents</b>					
<i>Rattus fuscipes</i>	Southern Bush Rat			Wildthing	T

SCIENTIFIC NAME	COMMON NAME	BC ACT	EPBC ACT	RECORD SOURCE	OBSERVATION TYPE
<b>Order Lagomorpha</b>					
<b>Family Leporidae</b>					
* <i>Lepus capensis</i>	European Hare			Wildthing	Q, O
* <i>Oryctolagus cuniculus</i>	European Rabbit			Wildthing	O
<b>Order Carnivora</b>					
<b>Family Canidae</b>					
* <i>Canis familiaris</i>	Dog			Wildthing	Q
<i>Canis familiaris dingo</i>	Dingo			Wildthing	Q, O



## Appendix I Tree Survey Results

### Tree Data Key for Table I1 and I2.

- **DBH** – Diameter at Breast Height. Tree trunk diameter measured at breast height (1.4 metres above ground level). Fabric diameter tape is 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 significant trees within the subject land and within close proximity.**

Tree No.	Tree Species	Easting	Northing	DBH (m)	Height (m)	Hollows				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
1	<i>Corymbia gummifera</i> Red Bloodwood	423271	6386708	0.6	11			1	2		No
2	<i>C. gummifera</i>	423267	6386729	0.51	11					Arboreal termite nest with holes	Yes
3	<i>Eucalyptus pilularis</i> Blackbutt	423219	6386720	0.34, 0.56	13		1				Yes
4	<i>E. pilularis</i>	423225	6386735	0.42	13				1	Wear around hollow	Yes
5	<i>E. pilularis</i>	423204	6386753	0.69	16					Arboreal termite nest with holes	Yes
6	<i>E. pilularis</i>	423231	6386751	0.48, 0.49	14	1			1		Yes
7	<i>C. gummifera</i>	423266	6386752	0.26	7				2		No
8	<i>C. gummifera</i>	423249	6386754	0.55	12			1	1		No
9	<i>E. pilularis</i>	423248	6386759	0.20, 0.61	17	1	1			Hollow trunk connecting one hollow opening to the other	No
10	<i>E. pilularis</i>	423224	6386759	0.44	11	1					Yes
11	<i>E. pilularis</i>	423221	6386771	0.55	10			1		Hollow starts at top of scar and goes upwards into trunk	Yes
12	<i>E. pilularis</i>	423218	6386774	0.35	9		1				Yes
13	<i>C. gummifera</i>	423231	6386806	0.53	14					Arboreal termite nest	No
14	Dead <i>C. gummifera</i>	423281	6386802	0.27, 0.27	2.5			1		Lost limbs, hollow stems/trunks remain	No
15	Dead Trunk	423259	6386836	0.27	3.5		1				No
16	<i>C. gummifera</i>	423267	6386825	0.42	11			1	1?	Main trunk dead. Scar with hollow	No
17	<i>C. gummifera</i>	423274	6386831	0.44	15				1		No
18	Dead	423280	6386826	0.33, 0.38	10				2?		No
19	Dead	423295	6386826	0.32	5				1		No
20	<i>C. gummifera</i>	423292	6386831	0.37	13				1	Scar with dead stem/hollow	No
21	<i>C. gummifera</i>	423269	6386839	0.53	18				1		No
22	<i>E. pilularis</i>	423255	6386849	0.31			2			Long opening in trunk	No
23	<i>C. gummifera</i>	423260	6386872	0.4	6				1	Hollow 1m up trunk, 8cm deep	No
24	<i>C. gummifera</i>	423293	6386864	0.29	12			1			No
25	Dead	423286	6386847	0.39	5					hollow trunk	No
26	<i>C. gummifera</i>	423301	6386878	0.35, 0.29	8			2	1	Opening through base that goes up trunk	No
27	<i>C. gummifera</i>	423246	6386910	0.47	17			1			No
28	<i>C. gummifera</i>	423260	6386909	0.56,	17				2?	Two stems	No

Tree No.	Tree Species	Easting	Northing	DBH (m)	Height (m)	Hollows				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
				0.58, 0.75							
29	<i>E. pilularis</i>	423276	6386895	0.47, 0.48	14						No
30	<i>E. pilularis</i>	423284	6386901	0.49	15				1		No
31	<i>C. gummifera</i>	423312	6386879	0.27, 0.65					1	Two stems, one dead/hollow	No
32	<i>E. pilularis</i>	423324	6386894	0.36, 0.40				1	1	Dead, hollow second stem/trunk	No
33	<i>E. pilularis</i>	423308	6386915	0.41, 0.44	16			1		Hollow at base of tree going up trunk	No
34	<i>C. gummifera</i>	423312	6386930	0.33	8				1	Dead, flaky stem with hollow 1m up trunk	No
35	Dead	423336	6386948	0.32	5				1	Arboreal termite nest in tree	No
36	<i>C. gummifera</i>	423345	6386956	0.46	13				1		No
37	<i>C. gummifera</i>	423290	6386963	0.56	16				1		No
38	<i>E. pilularis</i>	423274	6386980	0.57	15			1?		Opening in scar in trunk	No
39	<i>E. pilularis</i>	423298	6386984	0.50, 0.57	15			1			No
40	Dead	423276	6386985	0.46	6		1-spout		1	Flaky bark, scar at base of tree	No
41	<i>C. gummifera</i>	423315	6386996	0.37	12					Plastic tree tag #20	No
42	<i>C. gummifera</i>	423364	6386961	0.62	17				1		No
43	<i>C. gummifera</i>	423365	6386980	0.76	16			1	2	Plastic tree tag #49, metal tree tag H9. 2 Arboreal termite nests with holes in them.	No
44	Dead	423358	6386999	0.37	10				3	Flaky bark	No
45	Dead	423336	6386993	0.48				1		Plastic tree tag #37, metal tree tag H7. Flaky bark	No
46	<i>E. pilularis</i>	423299	6387005	0.47	14				1?	Plastic tree tag #19. Hole at base of tree	No
47	Dead	423355	6387032	0.45	5	1-spout	1			Class 2 hollow 1m up trunk	No
48	Dead	423357	6387044	0.32	13			1	1		No
49	<i>E. pilularis</i>	423320	6387035	0.7	17				1		No
50	<i>C. gummifera</i>	423299	6387063	0.68	16				1		No
51	<i>C. gummifera</i>	423305	6387075	0.4	13			1	1		No

Tree No.	Tree Species	Easting	Northing	DBH (m)	Height (m)	Hollows				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
52	<i>C. gummifera</i>	423319	6387064	0.4	17				1		No
53	Dead	423342	6387066	0.31	6		1				No
54	<i>E. pilularis</i>	423355	6387047	0.75	16				2		No
55	<i>E. pilularis</i>	423369	6387048	0.72	19			1			No
56	<i>E. pilularis</i>	423303	6387077	0.64	19			1			No
57	<i>C. gummifera</i>	423293	6387078	0.61	16			1	1	Metal tree tag H12	No
58	<i>C. gummifera</i>	423318	6387098	1.08	19		1			Scar/opening at base	No
59	Dead	423344	6387117	0.56	8		1				No
60	<i>C. gummifera</i>	423424	6387095	1.02	20		1		2	Painted H3. Large scar/opening that likely does not hollow out	No
61	<i>E. pilularis</i>	423398	6387106	0.81	20	1-at base		1			No
62	Dead	423394	6387120	0.23	8		1				No
63	<i>C. gummifera</i>	423364	6387133	0.62	18			1	1		No
64	<i>E. pilularis</i>	423340	6387133	0.58	16		1				No
65	<i>E. pilularis</i>	423328	6387141	0.76	17		1				No
66	Dead	423322	6387150	0.56	11			3	2		No
67	<i>E. pilularis</i>	423341	6387146	0.99	18			1			No
68	<i>E. pilularis</i>	423362	6387152	0.6	15	1					No
69	<i>E. pilularis</i>	423363	6387144	1.14	18	1		1	1	Medium sized stick nest	No
70	<i>C. gummifera</i>	423396	6387137	0.72	16			1	1		No
71	<i>E. pilularis</i>	423412	6387133	0.64	13		1		1		No
72	<i>C. gummifera</i>	423419	6387120	0.53	17		1	1			No
73	<i>C. gummifera</i>	423431	6387111	0.57	16			1		Hollow goes up branch	No
74	<i>E. pilularis</i>	423432	6387124	0.53	14				1		No
75	Dead	423422	6387140	0.43	8		1-spout		1		No
76	<i>C. gummifera</i>	423405	6387146	0.64	12			2	2		No
77	<i>E. pilularis</i>	423408	6387151	0.86	18	2	1	1	1-at base		No
78	<i>E. pilularis</i>	423401	6387156	0.8	19			1			No
79	Dead	423378	6387174	0.8	13						No
80	Dead	423379	6387178	0.56	11						No
81	<i>C. gummifera</i>	423349	6387169	0.88	19			1			No
82	<i>C. gummifera</i>	423328	6387172	0.55	12		1				No
83	<i>E. pilularis</i>	423323	6387176	0.99	22			1			No
84	<i>C. gummifera</i>	423373	6387199	0.84	22		1		1		No



Tree No.	Tree Species	Easting	Northing	DBH (m)	Height (m)	Hollows				Comments	Removal Required?
						Class 1	Class 2	Class 3	Class 4		
85	<i>E. pilularis</i>	423401	6387189	1.08	20			1	2		No
86	Dead	423433	6387167	0.51	8						No
87	<i>E. pilularis</i>	423449	6387168	0.78	21			1			No
88	<i>E. pilularis</i>	423454	6387185	0.82	19	1			1		No
89	Dead	423434	6387182	0.49	8	1-spout		1		Class 1 hollow 4m up trunk	No
90	<i>E. pilularis</i>	423432	6387188	0.93	20			1	1		No
91	<i>E. pilularis</i>	423405	6387205	1.02	23			1			No
92	<i>E. pilularis</i>	423352	6387230	0.92	21		2	1		Metal tree tag H11	No
93	<i>E. pilularis</i>	423397	6387219	0.91	22		1				No
94	Dead	423410	6387224	0.73	10	2	1	1			No
95	<i>E. pilularis</i>	423458	6387215	0.9	21				1	H35 painted onto trunk	No
96	<i>E. pilularis</i>	423431	6387227	0.84	17		1				No
97	<i>E. pilularis</i>	423429	6387235	0.75	20				2	Plastic Tree Tag #12. H32 painted onto trunk	No
98	<i>E. pilularis</i>	423448	6387239	0.83	19		1		1	Plastic Tree Tag #8	No

**Table I2: Details of koala use trees within the subject land and within close proximity.**

Tree No.	Tree Species	Easting	Northing	DBH (m)	Height (m)	Comments	Removal Required?
1	<i>Eucalyptus robusta</i> (Swamp Mahogany)	423231	6386952	0.45, 0.44	16	Little evidence of Koala activity	Yes
2	<i>E. robusta</i>	423034	6386754	0.4, 0.3	9	Little evidence of Koala activity	Yes
3	<i>E. robusta</i>	423031	6386775	0.43,0.2	10	Little evidence of Koala activity	Yes
4	<i>Eucalyptus microcorys</i> (Tallowwood)	423339	6387067	0.25	17	Little evidence of Koala activity	No
5	<i>E. microcorys</i>	423339	6387062	0.27	17	Little evidence of Koala activity	No
6	<i>E. microcorys</i>	423379	6387053	0.28	17	Little evidence of Koala activity	No
7	<i>E. microcorys</i>	423376	6387048	0.27	17	Little evidence of Koala activity	No
8	<i>E. microcorys</i>	423368	6387045	0.22	15	Little evidence of Koala activity	No
9	<i>E. microcorys</i>	423373	6387044	0.22	14	Little evidence of Koala activity	No
10	<i>E. microcorys</i>	423370	6387041	0.1	8	Little evidence of Koala activity	No
11	<i>E. microcorys</i>	423366	6387040	0.21	16	Little evidence of Koala activity	No

Tree No.	Tree Species	Easting	Northing	DBH (m)	Height (m)	Comments	Removal Required?
12	<i>E. microcorys</i>	423372	6387001	0.3		Little evidence of Koala activity	No
13	<i>E. microcorys</i>	423330	6386985	0.2, 0.2	14	Little evidence of Koala activity	No
14	<i>E. microcorys</i>	423330	6386982	0.25	15	Little evidence of Koala activity	No
15	<i>E. microcorys</i>	423333	6386981	0.25, 0.25	13	Little evidence of Koala activity	No
16	<i>E. microcorys</i>	423367	6387107	0.24		Little evidence of Koala activity	No
17	<i>E. microcorys</i>	423366	6387106	0.23		Little evidence of Koala activity	No
18	<i>E. microcorys</i>	423390	6387106	0.33	9	Little evidence of Koala activity	No
19	<i>E. microcorys</i>	423389	6387100	0.25	10	Little evidence of Koala activity	No