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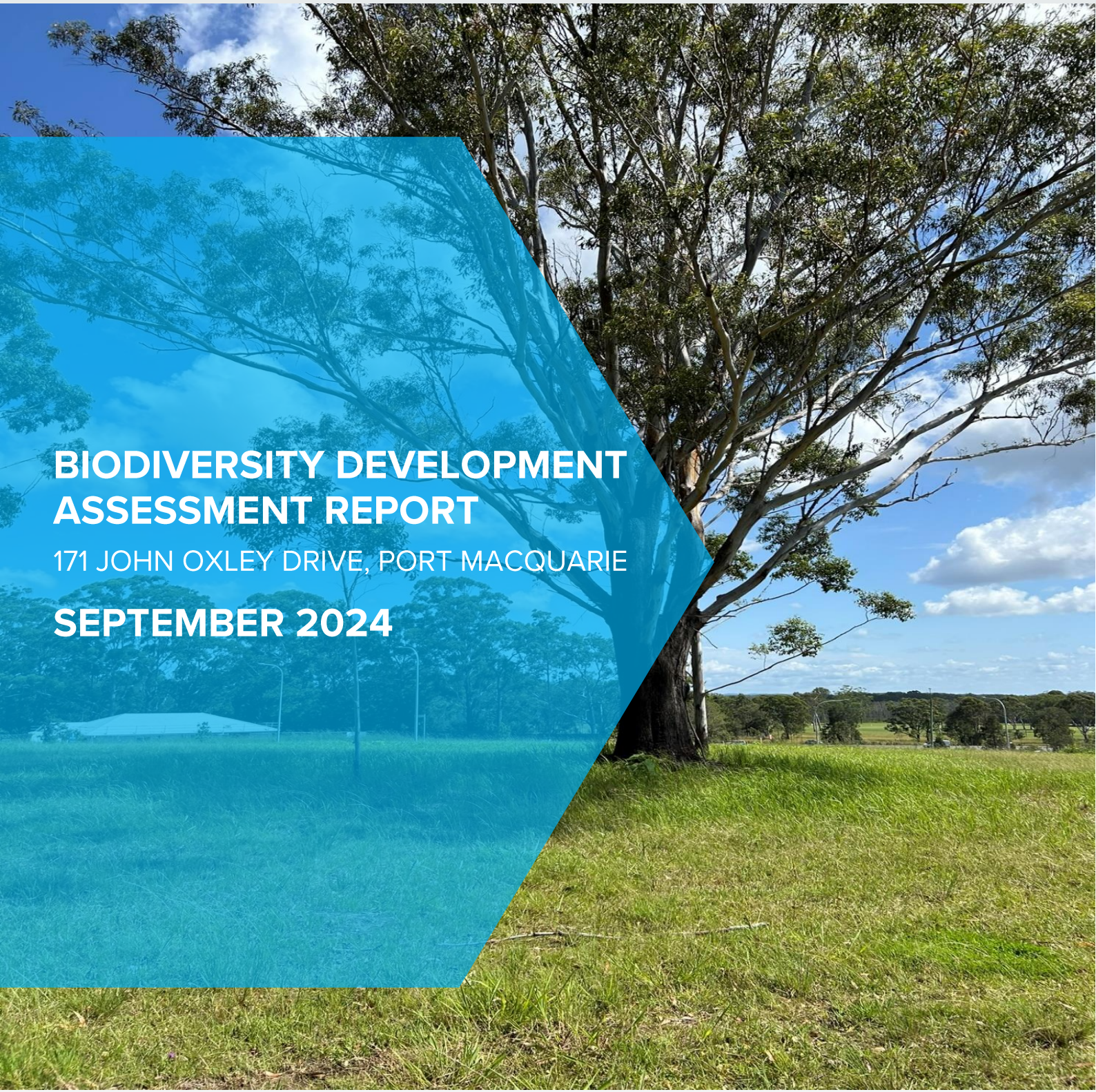

BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

171 JOHN OXLEY DRIVE, PORT MACQUARIE

SEPTEMBER 2024

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Version Control

Version	Purpose	Author	Reviewed / approved by	Date
Rev 0.1	Draft Report	Andrew Bates	Nigel Cotsell	10/06/2024
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Executive Summary

This report has assessed the impact of a place of public worship on Lot 22 DP1296583, 171 John Oxley Drive, Port Macquarie (the Subject Land). The Subject Land is 1.851 ha. The Development Footprint is located on the northern portion of the Subject Land, of approx. 0.98 ha.

The northern section of the Subject Land is zoned R1 – General Residential, whilst the southern half is C2 – Environmental Conservation. The area of land zoned R1 is 0.98 ha including the extension of Annabella Drive which contains 1,289m^2 in that area of the Development Footprint. Approximately 0.86 ha of the Subject Land is zoned as C2.

The Subject Land and Development Footprint is zoned R1 – General Residential and the extent of clearing required exceeds the clearing threshold prescribed under the Biodiversity Assessment Method 2020 (BAM). A Biodiversity Development Assessment Report (BDAR) is therefore required to submit with the development application.

Two (2) vegetation communities (PCTs) were identified in the Development Footprint, and these were separated into four (4) distinct vegetation zones. The total area of native vegetation that will require removal for the development is 0.98 ha. This impact is recommended to be offset through purchase and retirement of appropriate ecosystem credits as described in this report and restoration of the southern portion of the Lot under a Vegetation Management Plan.

An area of Biodiversity Values associated with important areas for 'Threatened species or communities with potential for serious and irreversible impacts" occurs in the southern half of the Subject Land. This area has intentionally been excluded from Development Footprint and will not be impacted by the proposed works. Rather, vegetation management has the potential to increase the quality of habitat for native species.

The Development Footprint does not contain any EECs, Coastal Wetlands or Serious and Irreversible Impacts. Furthermore, no threatened flora or fauna species were detected within the Development Footprint despite targeted survey by suitably qualified BAM accredited assessors.

Direct impacts of the proposal will be limited to vegetation and habitat removal. Several mitigation measures will be implemented to reduce potential offsite impacts during the construction phase. Indirect impacts that may be associated with the proposal are considered to be minor and can be mitigated through the measures described in this report.

Assessment of the proposal has been undertaken against the South Lindfield Koala Plan of Management 2018. The Development Footprint was found to contain areas mapped as 'Garden Plantings' with several scattered areas of 'Dry Sclerophyll Forest', which represents isolated trees. Vegetation Community and Koala Habitat Assessments were carried out over the Development Footprint which determined that floristic composition, in many areas, did not meet the definition of Preferred Koala Habitat, however 22 mature Eucalypts (representing 12 Koala Feed Trees) were tagged within the Development Footprint. These trees will be offset in the south of the Subject Land at a 2:1 ratio, and therefore, the proposal has demonstrated compliance with the Ameliorative Measures described within Section 7 of the KPoM.

The MNES significance assessments carried out for the proposed development determined that the proposal is not expected to significantly impact upon any of the known or potentially occurring threatened species on the Subject Land. Consequently, the proposal is not considered to require referral to the DCCCEEW for approval under the EPBC Act 1999.

Abbreviations

Table 1: List of abbreviations within report

BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
Bio Aus.	Biodiversity Australia
BOS	Biodiversity Offset Scheme
DAWE	Department of Agriculture, Water and the Environment
DEC	Department of Environment and Conservation
DPE	Department of Planning and Environment
DSEWPC	Department of Sustainability, Environment, Water, Population and Communities
EEC	Endangered Ecological Community
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
GIS	Geographic Information System
HBT	Hollow-bearing Tree
KFT	Koala Food Tree
KPoM	Koala Plan of Management
KTP	Key Threatening Process
LGA	Local Government Area
MNES	Matter of National Environmental Significance
NSW	New South Wales
OEH	Office of Environment and Heritage
PCT	Plant Community Type
PIR	Passive Infrared Camera
SAII	Serious and Irreversibly Impacts
SAT	Spot Assessment Technique
SEPP	*State Environmental Protection Policy*
TBDC	Threatened Biodiversity Data Collection
TEC	Threatened Ecological Community
VMP	Vegetation Management Plan

STAGE 1 - BIODIVERSITY ASSESSMENT

1. Introduction

Biodiversity Australia (Bio Aus) was requested to undertake a Biodiversity Development Assessment Report (BDAR) for The Point Community Church for the development of a place of public worship, associated car parking and extension of Annabella Drive on Lot 22 DP1296583, 171 John Oxley Drive, Port Macquarie (the Subject Land).

1.1 Requirement for the BDAR

The Subject Land is zoned as R1 – General Residential and C2 – Environmental Conservation, hence a 450m^2 minimum lot size applies. In accordance with the Biodiversity Assessment Method 2020 (BAM) this allows for a maximum clearing area of 0.25ha. As this proposed development will remove approximately 1ha of total vegetation a BDAR is required.

The Subject Land also contains an area of mapped Biodiversity Values in the southern half, with a small area being within the Development Footprint.

1.2 Definitions Used in the Report

This report uses the following key definitions:

- **Assessment Area:** includes the Subject Land and the area of land within the 1500 m buffer zone surrounding the subject land (or 500 m buffer zone for linear proposals) that is determined as per Subsection 3.1.2 of the BAM.
- **Subject Land:** Lot 22 DP1296583, 171 John Oxley Drive, Port Macquarie which is an area of 1.851 ha (Figure 1).
- **Development Footprint:** Refers to the area that will be directly impacted by the proposed action which covers approximately 0.98 ha of the Subject Land (Figure 2).

These definitions are in line with the BAM Methodology, which provides further explanation of definitions and legal terms that may be used in this report.

1.3 Structure of the Report

This report has been structured using guidance provided in Appendix K of the BAM. It is structured as follows:

- Section 1 – Introduction, provides background information for the assessment.
- Section 2 – Landscape Context, describes the landscape features of the Subject Land and Assessment Area.
- Section 3 - Native Vegetation, describes the native vegetation features of the Subject Land.
- Section 4 – Threatened Species, describes the threatened species and habitat features associated with the Subject Land.
- Section 5 – Avoid and Minimise Impacts, details avoidance and minimisation measures for the proposal.
- Section 6 – Impact Summary and Biodiversity Credit Report, provides an impact summary and the number and type of credits required to offset impacts.

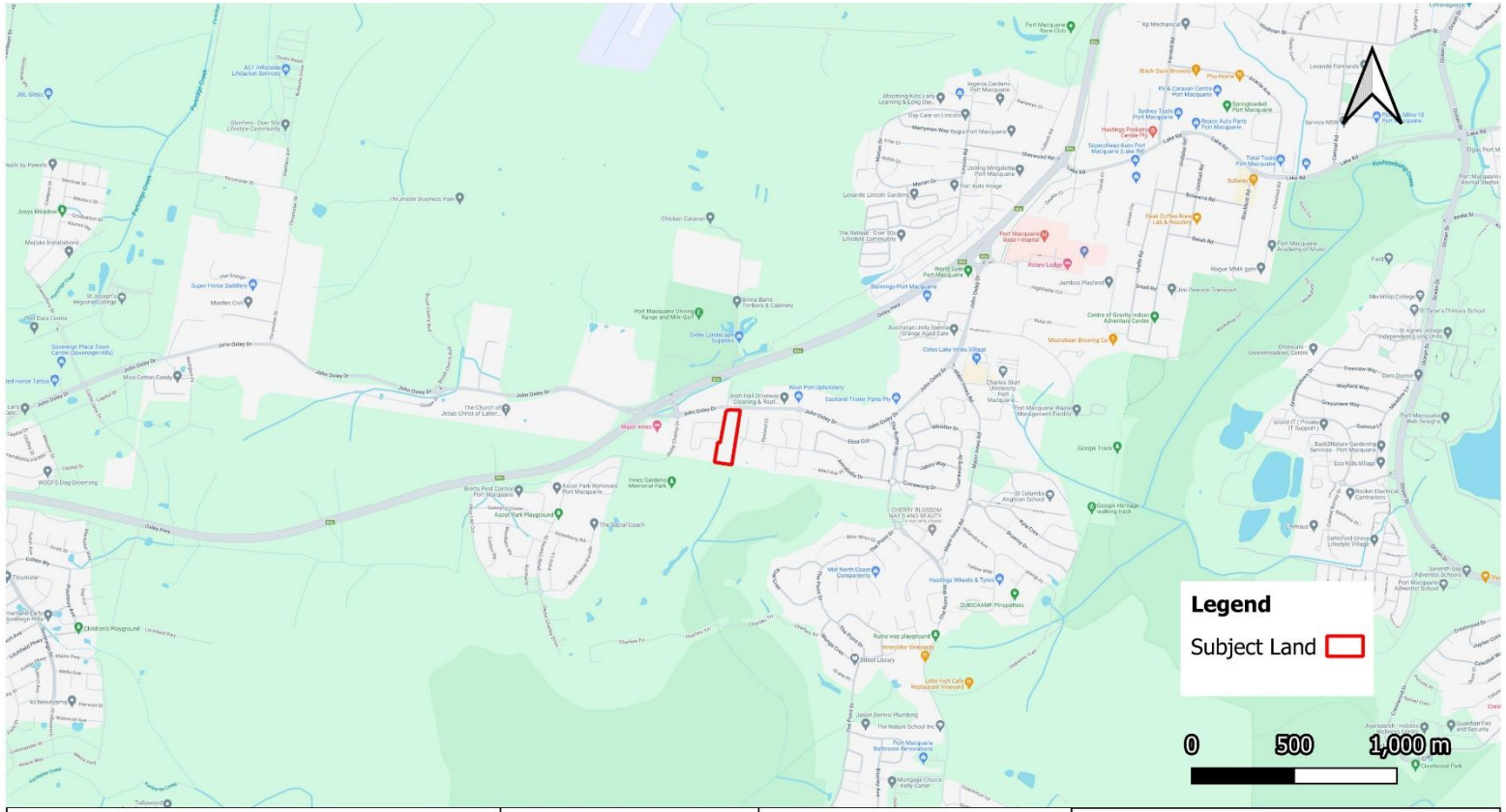
1.4 Description of the Subject Land

The Subject Land comprises a 1.851 ha property located at 171 John Oxley Drive, Port Macquarie. It is formally described as Lot 22 DP1296583. The northern section of the Subject Land is zoned R1 – General Residential, whilst the southern half is C2 – Environmental Conservation. The area of land zoned R1 is 0.98 ha including the extension of Annabella Drive which contains 1,289m^2 in that area of the Development Footprint (Figure 2). Approximately 0.86 ha of the Subject Land is zoned as C2. The location of the Subject Land is provided within Figure 1 and areas shown in Figure 2.

The Subject Land consists of various distinct vegetation communities and multiple different integrity conditions within those communities resulting in a total of two vegetation zones. Uses of the Subject Land range from managed grasslands features scattered mature trees, as well as a conservation area in the southern half of the property where Biodiversity Values are located.

The Subject Land is surrounded by residential dwellings. To the south there is a memorial park and scattered bushland/wetlands. Photo Plate 1 provides representative photographs of the Subject Land.

Figure 1: Location of the Subject Land



This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.	Project Manager: KR	Figure Name: Location of the Subject Land	Biodiversity AUSTRALIA
	Drawn by: AB	Location: John Oxley Drive, Port Macquarie	
	Date: August 2024	Client: King and Campbell	Job Number: ENS5978 / Spatial Reference: MGA Zone 56/GDA 2020 / Scale: 1:30,000

Photo Plate 1: Images of the Subject Land


Photo 1


Photo 2


Photo 3


Photo 4

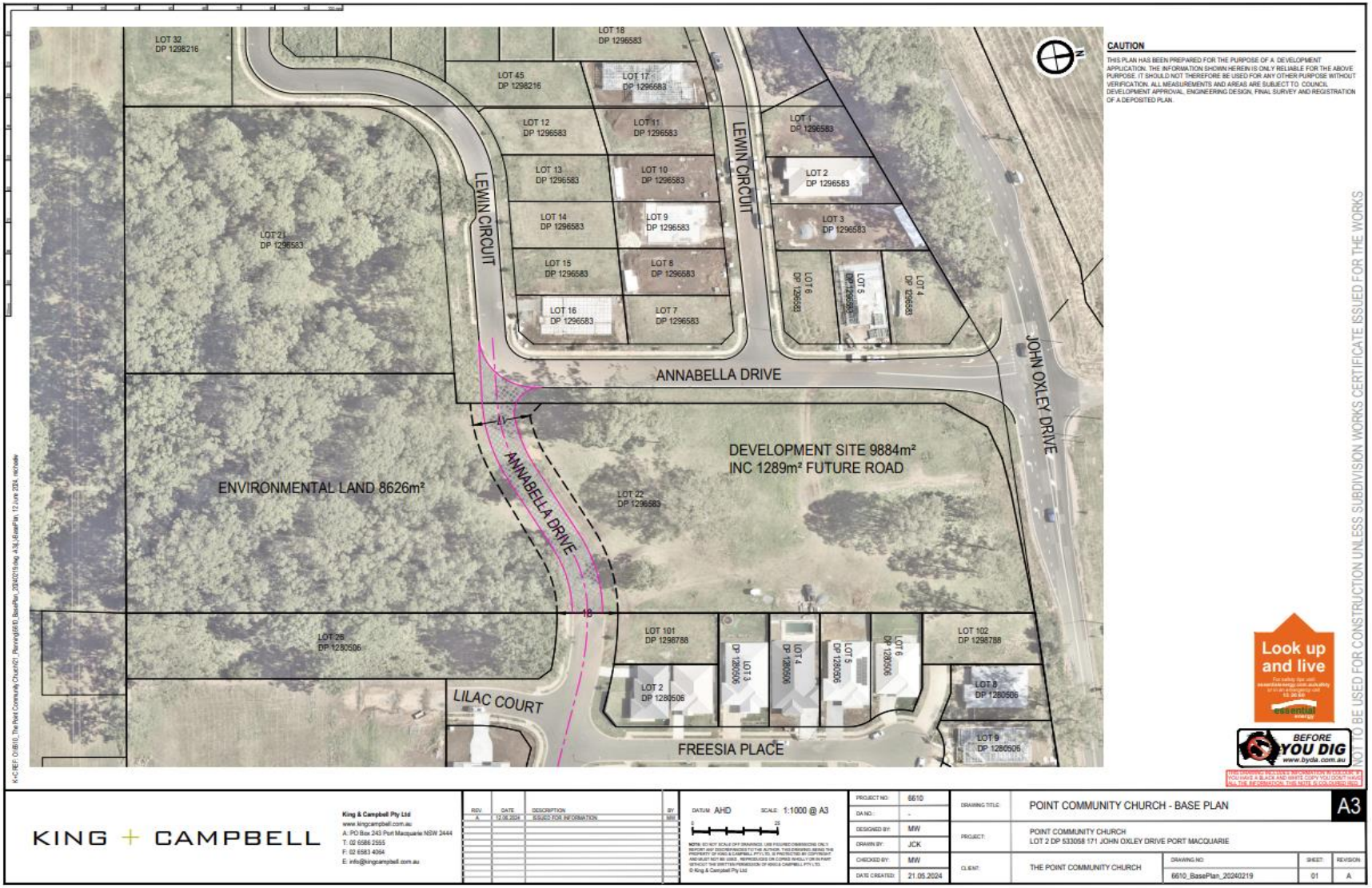

Photo 5


Photo 6


Photo 7


Photo 8

Figure 2: Proposed development layout



1.5 Information Sources

The following databases and Geographic Information System (GIS) layers were searched/obtained:

- Department of Climate Change, Energy, the Environment and Water - Protected Matters Search Tool (DCCEEW 2024a).
- Department of Climate Change, Energy, the Environment and Water - MNES SPRAT Profiles (DCCEEW 2024b).
- Office of Environment and Heritage Threatened Biodiversity Data Collection (OEH 2024).
- NSW Department of Planning and Environment - BioNet/Atlas of Wildlife (DPE 2024a).
- NSW Department of Planning and Environment - Regional Corridors and Key Habitat Mapping (DPE 2023b).
- NSW Department of Planning, Industry and Environment - Biodiversity Values Map and Threshold Tool and digital data layer (DPE 2024c) (Figure 3).
- NSW Department of Planning, Industry and Environment – BioNet Vegetation Classification (DPE 2024)
- NSW Department of Planning and Environment – NSW Mitchell Landscapes (DPE 2024d).
- NSW Department of Planning and Environment – State Vegetation Type Mapping (DPE 2024e).
- Coastal Quaternary Geology – North and South Coast of NSW digital data layer (Troedson & Hashimoto 2008).
- Koala Plan of Management - South Lindfield KPoM Stage 3: Koala Plan of Management (Biodiversity Australia, 2018).

2. Site Context

2.1.1 IBRA Bioregions and Subregions

The Subject Land is located in the NSW North Coast IBRA region and the Macleay Hastings subregion. The Subject Land is located on the Macleay Coastal Alluvial Plains Mitchell Landscape.

2.1.2 Native Vegetation Extent in 1500m Buffer

A 1500 m buffer was established around the Subject Land (Figure 4). Analysis with GIS has determined that there is approximately 42 % native vegetation cover within 1500 m buffer.

2.1.3 Cleared Areas

Cleared areas occur both on and adjacent to the Subject Land. Part of the Subject Land has been cleared and is regularly mown.

2.1.4 Landscape Features

The following table shows the presence of landscape features on the Subject Land and provides details of these features if present.

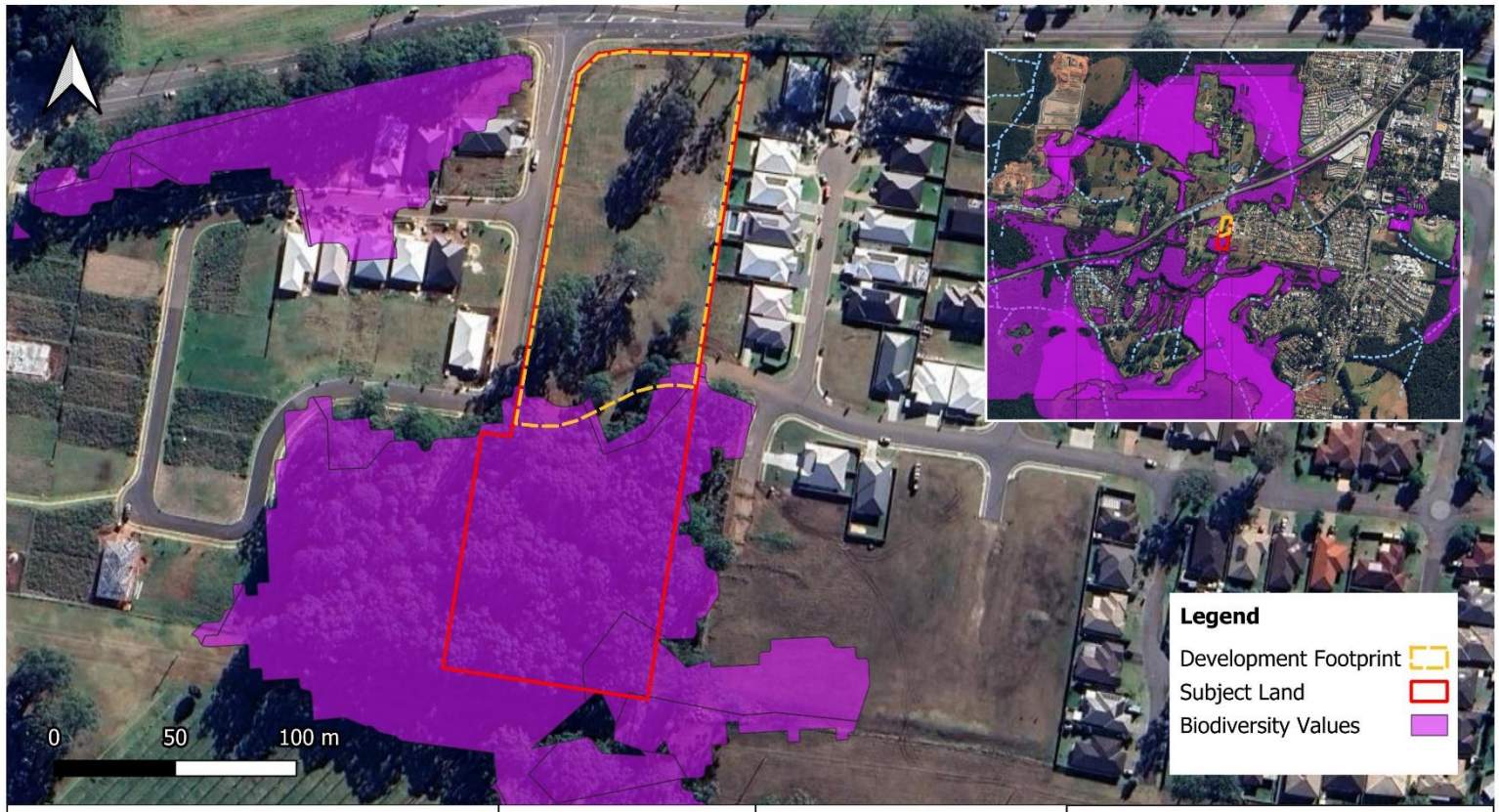
Table 2: Landscape features present

Feature	Present on site?	Present on adjoining land?	Description
Rivers and Streams	No	No	-
Important Local Wetlands	No	No	-
Connectivity Features	No	No	No connectivity features within the Subject Land as per Figure 5: Regional connectivity.
Areas of Geological Significance (e.g. karst, caves, crevices, cliffs)	No	No	-
Soil Hazard Features	No	No	-

2.1.5 Biodiversity Values

The Subject Land contains an area mapped as Biodiversity Values Area. Part of this Biodiversity Values area is mapped within the Development Footprint (Figure 3) and will be impacted by the construction of Annabella Drive, a connecting road located in the centre of the Subject Land. Vegetation in this area which requires removal is located along a dirt track, and contains several young KFTs.

Biodiversity Values are mapped over mature vegetation in the south of the Subject Land. This mapping reflects “Threatened species or communities with potential for serious and irreversible impacts”.



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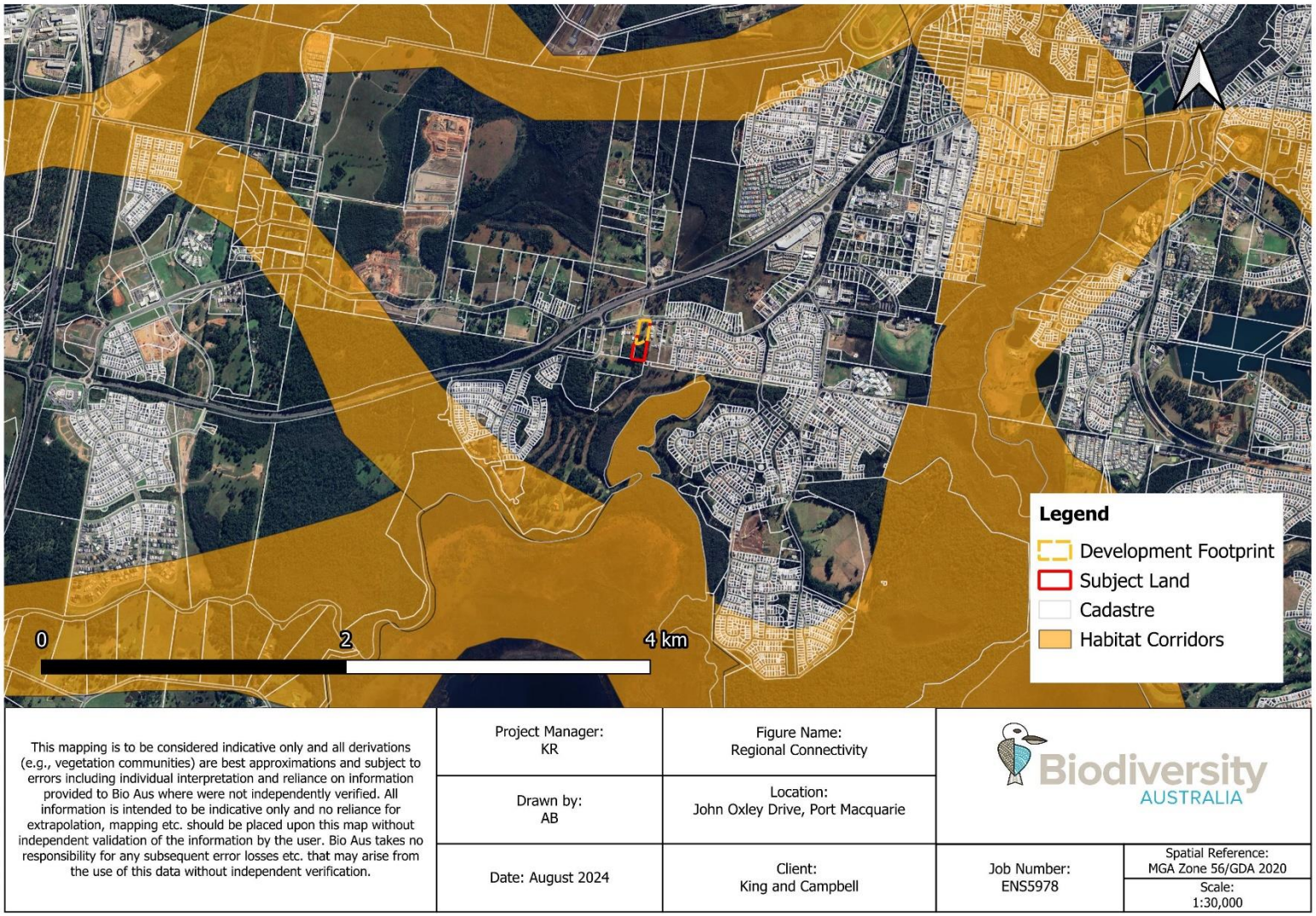
	Drawn by: AB	Location: John Oxley Drive, Port Macquarie		
	Date: August 2024	Client: King and Campbell	Job Number: ENS5978	Spatial Reference: MGA Zone 56/GDA 2020 Scale: 1:2,500

Figure 3: Biodiversity Values map

This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.	Project Manager: KR	Figure Name: Site Context and Native Vegetation	Biodiversity AUSTRALIA	
	Drawn by: AB	Location: John Oxley Drive, Port Macquarie		
	Date: August 2024	Client: King and Campbell	Job Number: ENS5978	Spatial Reference: MGA Zone 56/GDA 2020 Scale: 1:6,500

Figure 4: Site context



This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.	Project Manager: KR	Figure Name: Regional Connectivity	Biodiversity AUSTRALIA	
	Drawn by: AB	Location: John Oxley Drive, Port Macquarie		
	Date: August 2024	Client: King and Campbell	Job Number: ENS5978	Spatial Reference: MGA Zone 56/GDA 2020 Scale: 1:30,000

Figure 5: Regional connectivity

3. Native Vegetation

3.1 Survey Methods

Vegetation surveys were undertaken by a BAM accredited assessor and Senior Ecologist on 28 February 2024.

3.1.1 Vegetation Integrity Survey

Vegetation integrity survey plots were undertaken within the development footprint as per the BAM methodology. Each consists of a 20x20 metre plot in which floristic composition and structural attributes are collected, and a 20x50 metre plot which collects ecosystem function attributes.

The vegetation within the Subject Land has been disturbed over many years and as such the structure of the Vegetation Zones varies substantially. The establishment of multiple Vegetation Zones is one method which has been adopted to categorise these differences in structure of integrity. In this circumstance, the method for locating plots was used as an additional measure to ensure that plot data was representative of the numerous Vegetation Zones throughout the Subject Land. Randomly allocated locations and bearings were not considered appropriate as it allowed a high probability of misrepresenting the Vegetation Zone. For this reason, plots were located to ensure they capture the attributes relevant to that Vegetation Zone as per Section 4.3.4 (3)(c) of the BAM 2020. Section 4.3.4 (5) was also fully considered and adopted in this process. In some circumstances, this meant that plot locations fell within 50m of ecotones.

The following information was collected within each vegetation plot:

- Observer, location and date;
- Plot dimensions and orientation;
- Photographic record of vegetation;
- Vegetation Class and Plant Community Type (PCT);
- Physical features and disturbance history;
- Full flora list;
- Presence of hollow-bearing trees;
- Length of logs; and
- Litter cover. Growth-form cover and abundance of each species;
- Exotic and High Threat Exotic (HTE) plant cover;
- Number of large trees;
- Recruitment;

The field data collected was tallied and input into the BAM calculator to determine a vegetation integrity score for each vegetation zone.

3.1.2 Vegetation Classification and Mapping

Vegetation communities were sampled by the vegetation plots described above and through walking random meander transects. Due to the limited extent of vegetation on the Subject Land this provided 100 % coverage. The random meander transects also allowed for a more comprehensive flora inventory on the Subject Land.

The vegetation communities were described from data collected during the vegetation plots and random meander transect studies. The vegetation classification is based on the NSW Plant Community Type (PCT) Classification.

Plant species were identified to species or subspecies level and nomenclature conforms to that currently recognised by the Royal Botanic Gardens and follows Harden and PlantNET for changes since Harden.

3.2 Plant Community Type Descriptions

The Development Footprint is largely cleared of remnant vegetation and exists as a previously cleared grassland with scattered mature Eucalypts. Two areas support mature Eucalypts, the southwestern and northeastern corners of the Development Footprint. The ground layer is routinely mown, and no shrub layer was present. The southern boundary of the Subject Land (within the footprint of the Annabella Drive connection) was highly disturbed, with several areas supporting bare ground and evidence of ongoing disturbance by vehicles accessing Annabella Drive. The southern extent of the Subject land (outside of the Development Footprint) supports a mature Eucalypt Forest dominated by Blackbutt (*Eucalyptus pilularis*) supported by a tall canopy and an established shrub layer. There are several tracks through the vegetation and evidence of human disturbance and established weed populations were recorded.

Two Plant Community Types were confirmed present within the Development Footprint.

- PCT 3166 Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest of the NSW North Coast Bioregion.
- PCT 3553 Northern Sands Bloodwood-Swamp Turpentine Forest of the NSW North Coast Bioregion.

The section below provides a description of the native vegetation within the Development Footprint that will be affected by the proposal. No PCTs are listed as Threatened Ecological Communities (TECs) or Endangered Ecological Communities (EECs) under the *EPBC Act* or *BC Act*.

These communities were largely consistent with the broad NSW Vegetation formation provided by the CRAFTI Lower North East Vegetation Mapping which had the Subject Land mapped as cleared (Figure 6). Vegetation zones have been more accurately mapped following the field verifications. These are presented in Figure 7: Vegetation zones and survey locations.

A description of the vegetation communities sampled is provided below, with photos following.

3.2.1 Community 1 – PCT 3166 Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest of the NSW North Coast Bioregion

Table 3: Community 1 - Description

Vegetation Community (NSW PCT)	No 3166 Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest of the NSW North Coast Bioregion
Vegetation Formation	Wet Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	North Coast Wet Sclerophyll Forests
Land Zones & Area	Low – 0.45 ha

EEC Status	N/A
Clearing Extent	60%, however the accuracy of the estimate has not been assessed.
Vegetation Zones	1
Number of Plots	1
Location	In the southern portion of the Subject Land, some representative trees scattered throughout.
Description	**Canopy:** Structure and Species: A closed forest dominated by *Eucalyptus pilularis;* this is the only canopy species present. **Shrub layer:** Structure and Species: The mid-stratum only existed as one *Tristaniopsis laurina*. **Ground layer:** Structure and Species: The ground stratum featured managed exotic grasses as well as natives scattered amongst the area. *Lobelia purpurascens* and *Centella asiatica* were species that were prevalent throughout. *Paspalum mandiocanum* was heavily present. **a) Lianas, scramblers, etc.:** *Hibbertia scandens* is present.
Condition	This community is overall in poor condition, due to heavy clearing and invasive species accounting for a significant portion of species observed at the time of survey.

Photo Plate 2: Community 1 at survey plot 1

3.2.2 Community 2 - PCT 3553 Northern Sands Bloodwood-Swamp Turpentine Forest of the NSW North Coast Bioregion

Table 4: Community 2 - Description

Vegetation Community	PCT 3553 Northern Sands Bloodwood-Swamp Turpentine Forest of the NSW North Coast
Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
Vegetation Class	Coastal Dune Dry Sclerophyll Forests
Land Zones & Area	Low – 0.54 ha
EEC Status	N/A
Clearing Extent	98% however the accuracy of the estimate has not been assessed.
Vegetation Zones	1
Number of Plots	1
Location and Area	Occurs predominantly in the northern half of the Subject Land
Description	**Canopy:** Structure and Species: An Open Forest dominated by *Eucalyptus tereticornis* and *Corymbia intermedia* are dominate throughout, and *Glochidion ferdinandi* is also present. **Shrub layer:** Structure and Species: The mid-stratum only featured *Breynia oblongfolia* as an occasional shrub. *Phyllostachys spp.* were also in abundance. **Ground layer:** Structure and Species: The ground stratum predominately featured manicured grasses with occasional native groundcovers. *Viola hederacea*, *Hypericum gramineum* and *Oplimenus aemulus* were abundant. The high threat exotic *Paspalum mandiocanum* was also present.
Condition	This community is overall in poor condition, due to heavy clearing and invasive species accounting for a significant portion of species observed at the time of survey. This community has potential to be a TEC

Photo Plate 3: Community 2 at survey plot 2

3.2.3 Justification of PCT and Vegetation Zones

3.2.3.1 PCT 3166 - Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest

This community has the necessary diagnostic features, substrate and landscape position to enable its identification at this Subject Land. The area of PCT is present in a highly disturbed state. The area;

- Does not contain any hollow bearing trees,
- Contains some large trees over 49cm DBH,
- Species diversity is low, &
- Weed coverage is high.

Table 5. Justification of PCT 3166 selection

PCT 3166 Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest of the NSW North Coast Bioregion		
Justification of PCT selection	**Search Term**	**Selection**
	IBRA Bioregion	NSW North Coast
	IBRA Sub-region	Macleay Hastings
	Vegetation Formation	Wet Sclerophyll Forests (Shrubby sub-formation)
	Upper Stratum Species	*Eucalyptus pilularis*
	Mid Stratum Species	*Tristaniopsis laurina*
	Selection	PCT selection for this VZ was largely in acceptance of the state vegetation mapping from SEED. The subject Land is in a significantly disturbed state, though with the canopy species being still representative of this PCT. Species searches returned a list of 1000+ possible PCT's meaning that the current vegetation state of this zone is too broad to be reasonably narrowed down into one PCT.

3.2.3.2 PCT 3553 - Northern Sands Bloodwood-Swamp Turpentine Forest

This community has the diagnostic features, substrate and landscape position to enable its identification at this site. The area is present in a slightly highly disturbed state. Overall, the condition of the area is considered poor. The area;

- Contains several large trees,
- Contains a low percentage cover of litter,
- Contains relatively high cover of weeds, &
- Has low diversity.

Table 6. Justification of PCT 3553 selection

PCT 3553 Northern Sands Bloodwood-Swamp Turpentine Forest of the NSW North Coast Bioregion		
Justification of PCT selection	**Search Term**	**Selection**
	IBRA Bioregion	NSW North Coast
	IBRA Sub-region	Macleay Hastings
	Vegetation Formation	Dry Sclerophyll Forests (Shrubby sub-formation)
	Upper Stratum Species	*Eucalyptus tereticornis, Corymbia intermedia*
	Mid Stratum Species	-
	Selection	PCT selection for this VZ was largely in acceptance of the state vegetation mapping from SEED. The subject Land is in a significantly disturbed state, though with the canopy species being still representative of this PCT. Species searches returned a list of 1000+ possible PCT's meaning that the current vegetation state of this zone is too broad to be reasonably narrowed down into one PCT.

3.3 Vegetation Integrity Assessment

3.3.1 Vegetation Zones and Integrity Scores

Figure 7: Vegetation zones and survey locations shows the location of these zones.

Table 7: Vegetation zone and current integrity score

Vegetation Community	Zone	Condition Class	No. of plots	Patch Size	Area (ha)	Vegetation Integrity (VI) Score			
						Composition	Structure	Function	Score
PCT 3166 Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest	1	Heavily Modified	1	>100 ha	0.13	15.8	11.1	8.7	11.5
	3	Derived Grassland	1	>100 ha	0.32	13	3.7	15	9
PCT 3553 Northern Sands Bloodwood-Swamp Turpentine Forest	2	Heavily Modified	1	>100 ha	0.14	31.7	50.4	7.6	23
	4	Derived Grassland	1	>100 ha	0.39	12	0.3	15	3.7

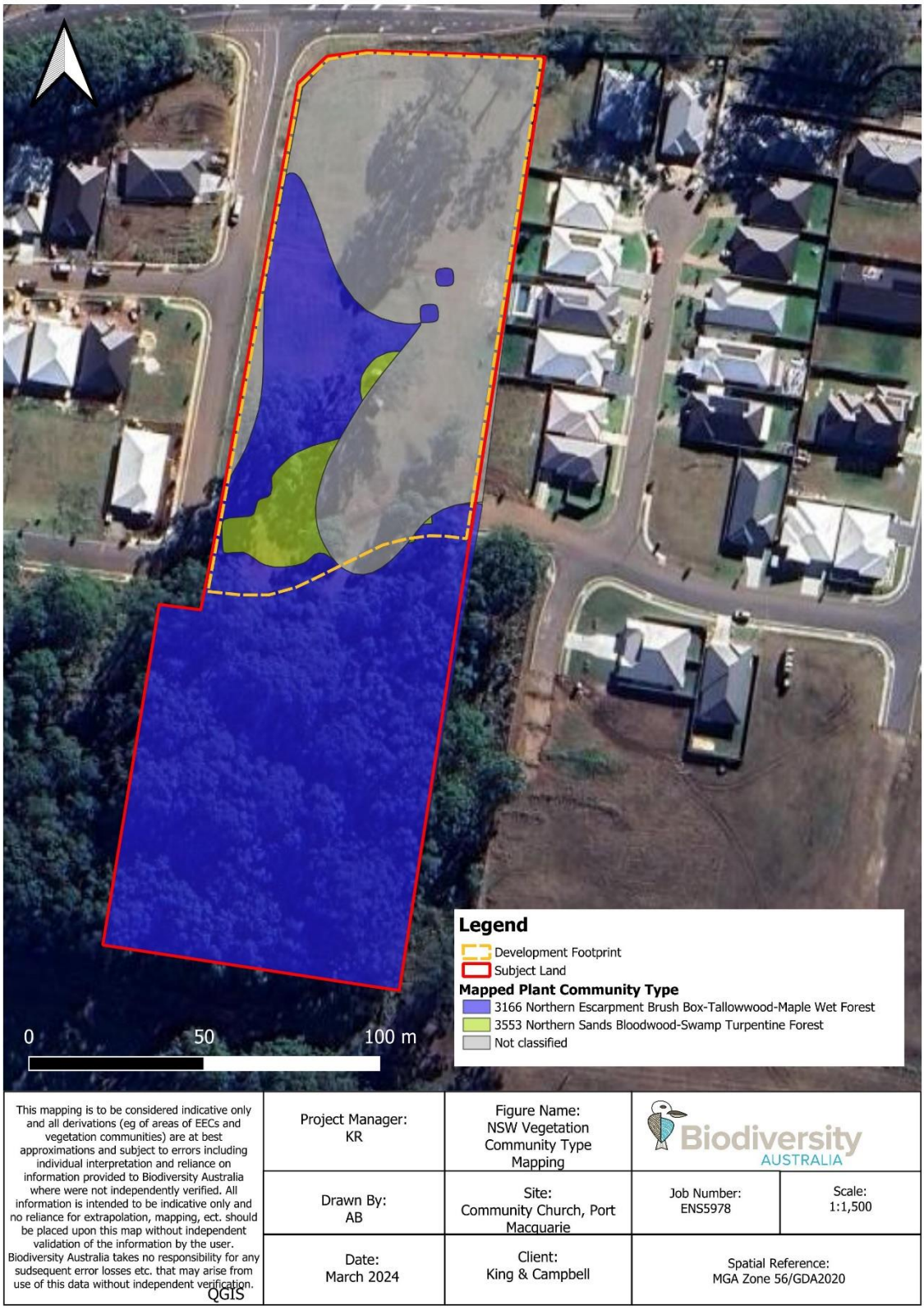


Figure 6: NSW Plant Community Type Mapping (SEED Portal)

This mapping is to be considered indicative only and all derivations (eg of areas of EECs and vegetation communities) are at best approximations and subject to errors including individual interpretation and reliance on information provided to Biodiversity Australia where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping, ect. should be placed upon this map without independent validation of the information by the user. Biodiversity Australia takes no responsibility for any sudsequent error losses etc. that may arise from use of this data without independent verification.	Project Manager: KR	Figure Name: Vegetation Zones and Plot Locations	Biodiversity AUSTRALIA
	Drawn By: AB	Site: Community Church, Port Macquarie	Job Number: ENS5978 / Scale: 1:1,500
	Date: March 2024	Client: King & Campbell	Spatial Reference: MGA Zone 56/GDA2020

Figure 7: Vegetation zones and survey locations

4. Threatened Species

4.1 Ecosystem Credit Species

Ecosystem credit species are threatened species which can be reliably predicted to occur by vegetation surrogates and landscape features. Targeted survey is not required for these species.

Some species which have specialised breeding requirements have dual credit classes to account for differences in foraging and breeding habitat. For example, Glossy Black Cockatoo foraging habitat can be reliably predicted through vegetation associations, however breeding habitat is specialised and requires hollow-bearing trees with hollows greater than 15 cm diameter and greater than five metres above the ground (OEH 2024a).

The BAM calculator produces a list of ecosystem credit species based on several attributes including Bioregion and subregion, patch size and the vegetation and habitat data collected in the field.

4.1.1 List of Species Derived

The threatened species derived from the BAM calculator that are predicted to occur within the Subject Land are presented in Table 8. These species have been predicted to occur based on the vegetation and habitat types observed during the field survey and are classed with ecosystem credits.

Four (4) species predicted to occur by the BAM calculator have been excluded from this list, as these species are unlikely to occur within the Subject Land due to a lack of suitable habitat and/or geographic restrictions. These species are listed in Table 9.

Table 8: Ecosystem credit species predicted to occur

Common Name	Scientific Name	Vegetation Types(s)	
		PCT 3166	PCT 3553
Barking Owl	*Ninox connivens*	✓	✓
Brown Treecreeper (eastern)	*Climacteris picumnus victoriae*	✓	✓
Common Blossom-bat	*Syconycteris australis*	✓	✓
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	✓	✓
Eastern Coastal Free-tailed Bat	*Micronomus norfolkensis*	✓	✓
Eastern Osprey	*Pandion cristatus*	✓	✓
Flame Robin	*Petroica phoenicea*	✓	
Golden-tipped Bat	*Phoniscus papuensis*	✓	
Grey-headed Flying-fox	*Pteropus poliocephalus*	✓	
Hooded Robin (south-eastern)	*Melanodryas cucullata cucullata*	✓	
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	✓	

Common Name	Scientific Name	Vegetation Types(s)	
		PCT 3166	PCT 3553
Little Bent-winged Bat	*Miniopterus australis*	✓	✓
Little Eagle	*Hieraaetus morphnoides*	✓	✓
Little Lorikeet	*Glossopsitta pusilla*	✓	✓
Masked Owl	*Tyto novaehollandiae*	✓	✓
Powerful Owl	*Ninox strenua*	✓	✓
Rose-crowned Fruit-Dove	*Ptilinopus regina*	✓	✓
Scarlet Robin	*Petroica boodang*	✓	
Speckled Warbler	*Chthonicola sagittata*		✓
Spotted Harrier	*Circus assimilis*		✓
Spotted-tailed Quoll	*Dasyurus maculatus*	✓	✓
Square-tailed Kite	*Lophoictinia isura*	✓	✓
Superb Fruit-Dove	*Ptilinopus superbus*	✓	
Swift Parrot	*Lathamus discolor*	✓	✓
Varied Sittella	*Daphoenositta chrysoptera*	✓	✓
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	✓	✓
White-throated Needletail	*Hirundapus caudacutus*	✓	✓

Table 9: Ecosystem credit species not predicted to occur on site

Common Name	Scientific Name	Habitat/Geographic constraints
Black-necked Stork	*Ephippiorhynchus asiaticus*	BAM Habitat constraints – Shallow, open freshwater or saline wetlands or shallow edges of deeper wetlands within 300m of these swamps / waterbodies **BAM constraint not met** Habitat – the Development Footprint does not contain suitable wetlands
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	BAM Habitat constraints - Presence of *Allocasuarina* and *Casuarina* species **BAM constraints not met:** *Habitat* - The Subject Land does not contain any *Allocasuarina* or *Casuarina* species at sufficient quantities to form a foraging resource for the species. .
Black Bittern	*Ixobrychus flavicolis*	BAM Habitat constraints – Waterbodies, Land within 40 m of freshwater and estuarine wetlands, in areas of permanent water and dense vegetation **BAM constraints not met:** *Habitat* - No waterbodies, or within 40m of waterbodies
Pale-vented Bush-hen	*Amaurornis moluccana*	BAM Habitat constraints – Waterbodies, Dense vegetation, within 300m of, or in shallows of streams or other natural or artificial wetlands **BAM constraints not met:** *Habitat* - No waterbodies, or within 300m of waterbodies *Geographic* – South of South West Rocks

4.2 Species Credit Species

Species credit species are threatened species or elements of their habitat that cannot be confidently predicted by vegetation surrogates and landscape features. Targeted survey is required for these species if the Subject Land contains suitable habitat and is within the predicted range of the species.

4.2.1 List of Candidate Species

The following table lists the candidate threatened species (species credits) that have been derived from the BAM calculator. Any additional species determined likely to be present by Bio Aus. were also added to the list and entered as an additional species in the BAM calculator. An assessment has been undertaken to determine if the habitat and geographic requirements are met on the Subject Land, and if targeted survey is required.

The species with suitable habitat/geographic requirements on the site requiring targeted survey are provided in Table 10, along with the survey timing for each species (from the OEH Threatened Species profile database) in which targeted surveys should be undertaken. Targeted survey has been undertaken for these species using the survey methods described in Section 4.3.

Species that have been excluded from the candidate species list are provided in Table 11, along with the assessment of habitat and geographic requirements which were not met by the Subject Land. Targeted surveys are not required for these species.

Table 10: List of candidate species credit species

Common Name	Scientific Name	Survey Timing
Flora		
-	*Allocasuarina thalassoscopica*	All year
White-flowered Wax Plant	*Cynanchum elegans*	All year
Craven Grey Box	*Eucalyptus largeana*	All year
Tall Velvet Sea-berry	*Haloragis exalata subsp. velutina*	All year
Slender Marsdenia	*Marsdenia longiloba*	Nov-Dec
Rusty Plum, Plum Boxwood	*Niemeyera whitei*	All year
Milky Silkpod	*Parsonsia dorrigoensis*	All year
Scant Pomaderris	*Pomaderris queenslandica*	All year
Scrub Turpentine	*Rhodamnia rubescens*	All year
Native Guava	*Rhodomyrtus psidioides*	All year
Rainforest Cassia	*Senna acclinis*	All year
Manning Yellow Solanum	*Solanum sulphureum*	All year
Fauna		
Rufous Bettong	*Aepyprymnus rufescens*	Oct - Mar
Bush-stone Curlew	*Burhinus grallarius*	All year
Eastern Pygmy-possum	*Cercartetus nanus*	Jul - Dec
Common Planigale	*Planigale maculata*	Aug - Oct

Common Name	Scientific Name	Survey Timing
Squirrel Glider	*Petaurus norfolcensis*	Jan - Dec
Brush-tailed Phascogale	*Phascogale tapoatafa*	Dec - Jun
Koala	*Phascolarctos cinereus*	Jan - Dec

Table 11: List of candidate species credit species excluded

Common Name	Scientific Name	Habitat/Geographic constraints
Fauna		
Barking Owl	*Ninox connivens*	No hollow bearing trees within the Subject Land
Davies' Tree Frog	*Litoria daviesae*	No waterbodies or wetlands occur on the Subject Land
Eastern Osprey	*Pandion cristatus*	The Subject Land does not contain the presence of a large stick nest in a tree above 15m and hence it is considered unlikely that the species will occur.
Giant Barred Frog	*Mixopyes iteratus*	No waterbodies or wetlands occur on the Subject Land or within 300m of the Subject Land
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	The Subject Land does not contain the required large hollow bearing trees that are essential for the lifecycle of the species. Unlikely to occur.
Green-thighed Frog	*Litoria brevipalmata*	No waterbodies or wetlands occur on the Subject Land
Grey-headed Flying-fox	*Pteropus poliocephalus*	The Subject Land does not contain any evidence of a roosting colony. Unlikely to occur for roosting purposes.
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	The Subject Land does not contain the cave, tunnel, mine, culvert or other structure required for the species to roost.
Laced Fritillary	*Argynnis hyperbius*	No arrowhead violet during survey identified, this species is also listed as not having potential to occur within the area.
Little Bent-winged Bat	*Miniopterus australis*	The Subject Land does not contain the cave, tunnel, mine, culvert or other structure required for the species to roost. Unlikely to occur
Little Eagle	*Hieraaetus morphnoides*	No suitable nest trees observed during the survey period.
Masked Owl	*Tyto novaehollandiae*	No hollow bearing trees within the Subject Land
Powerful Owl	*Ninox strenua*	No hollow bearing trees within the Subject Land
Southern Myotis	*Myotis macropus*	No waterbodies or wetlands occur on the Subject Land or within 300m of the Subject Land
Square-tailed Kite	*Lophoictinia isura*	No suitable nest trees observed during the survey period.
Swift Parrot	*Lathamus discolor*	No important habitat for this species listed.
Three-toed Snake-tooth Skink	*Coeranoscincus reticulatus*	No fallen debris or significant amounts of leaf letter within the Subject Land
Wallum Froglet	*Crinia tinnula*	Habitat too degraded to support this species and no waterbodies available
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	No suitable nest trees observed during the survey period.

4.3 Targeted Survey Methods

Targeted surveys were undertaken for the candidate species identified in Table 10: List of candidate species credit species. These were undertaken by a BAM Accredited Assessor with assistance from two other suitably qualified ecologists. The surveys were conducted under Biodiversity Australia's scientific licence and animal research authority.

A detailed description of the survey methods used is provided in the following sections.

4.3.1 Threatened Flora Survey

A targeted survey for the following threatened flora species was undertaken over the Subject Land in January 2024 by accredited assessor Nigel Cotsell (BAAS18026) and August 2024 by Ecologist Andrew Ritchie and Torr Cotsell. The flora species listed in Table 10 were the focus of these surveys, however searches incorporated all threatened species from the region.

The survey methodology consisted of field traverses as per the Surveying Threatened Plants and Their Habitats, NSW Survey guide for the Biodiversity Assessment Method 2020. This survey technique typically involves searches along a grid of parallel traverses within the Subject Land. The traverses are a set distance apart depending on the life form and type of vegetation and cover the entire extent of potential habitat for each target plant species. Due to the limited extent of vegetation on site, traverses were conducted along all vegetated areas and guided by 5m parallel traverses with occasional random meandering to inspect for smaller or more cryptic species. This ensured that the full extent of the Subject Land was surveyed.

The Subject Land was traversed by one BAM Accredited accessor as well as an Ecologist. Given the limited extent of the Development Footprint, this level of targeted threatened flora effort allowed for 100% coverage of the Development Footprint. Areas of exotic grassland were given the least amount of effort whilst habitats which had potential to support the aforementioned threatened species were afforded higher effort.

Targeted threatened flora survey was undertaken by Principal Ecologist – Nigel Cotsell (BAAS18026), Harrison Rosnell, Andrew Bates, Andrew Ritchie and Torr Cotsell.

Opportunistic searches for threatened flora species were also undertaken during the vegetation plot surveys as well as during other activities on the Subject Land.

4.3.2 Fauna Survey

In consideration of the survey requirements of the candidate threatened fauna species as listed within the Bionet Atlas, and other potentially occurring fauna species (DEC 2004, DECC 2007), the following survey methods were utilised:

- Habitat evaluation;
- Searches for secondary evidence e.g. scats and tracks;
- Reptile searches;
- Diurnal bird surveys;
- Pitfall trap array survey;
- Passive Infra-Red (PIR) cameras; and

- PIR Cameras.

Six (6) PIR cameras were deployed at the Subject Land and left *in situ* from the 25th of March – 10 May 2024. The PIR cameras were re-baited on 12 April 2024.

- Pitfalls

Three pitfall arrays were installed at the Subject Land on 25th march and removed on the 28th of March 2024. During the intervening period, early morning surveys were undertaken to determine the presence of *Planigale maculata* (Common planigale).

- Nocturnal spotlighting surveys

Nocturnal spotlighting surveys were conducted by two ecologists on the subject land after dusk on 13th and 15th March 2024. Call playback for the Bush-stone Curlew (*Burhinus grallarius*) was undertaken in accordance with BAM survey guidelines.

- Koala Spot Assessment Technique (SAT)

Two koala SAT surveys were undertaken on 22 August 2024 by accredited assessor Nigel Cotsell on the Subject Land, see Figure 8.

Surveys were undertaken by BAM accredited Ecologist and Ecologists under Biodiversity Australia's scientific license and animal research authority. The methods per survey measure are detailed below.

4.3.2.1 Habitat Evaluation

This was the main survey method employed to assess the suitability of site habitats for threatened species recorded in the locality, or in broadly similar habitats in the region.

Habitats on and adjacent to the Subject Land were defined and assessed according to parameters such as:

- Structural and floristic characteristics of the vegetation e.g. understorey type and development, crown depth, groundcover density, etc.
- Degree and extent of disturbance e.g. fire, logging, weed invasion, modification to structure and diversity, etc.
- Presence of water in any form e.g. rivers, dams, creeks, drainage lines, soaks.
- Size and abundance of hollows and fallen timber.
- Availability of shelter e.g. rocks, logs, hollows, undergrowth.
- Wildlife corridors, refuges and proximate habitat types.
- Presence of mistletoe, nectar, gum, seed, sap, etc. sources.

This information is considered for evaluation of the potential occurrence of threatened species on or adjacent to the site based on cited ecology and personal experience/knowledge of the species.

4.3.2.2 Secondary Evidence and Active Herpetological Searches

Physical habitat searches involved lifting of any timber, rocks and debris, and inspection of dense vegetation and leaf litter for frogs and reptiles; inspection of trees for Koalas and claw markings; binocular inspection of trees; looking for tree hollows; observation of likely basking sites; searches for nests; and searches for scats, owl regurgitation pellets, tracks and scratches.

Nocturnal active searches employed a similar method to the above and were undertaken in conjunction with spotlighting over three nights. These searches focused on detection of both arboreal and ground dwelling species.

A total of four hours was spent on habitat and secondary evidence searches over two nights.

4.3.2.3 Diurnal Bird Survey

This involved passive surveys (e.g. listening for bird calls) and active observation/binocular searches while walking around the entire Subject Land; and opportunistically during other activities. Bird surveys were undertaken primarily within two hours of dawn or dusk to coincide with periods of peak activity.

A total of six hours was spent on bird surveys over four days between January – August 2024.

4.3.2.4 Pitfall Trap Array Survey

Pitfall array surveys were conducted within the site over four nights to detect the presence of *Planigale maculata* (Common planigale). Three pitfall arrays were installed within the Subject Site in dry conditions, each array consisting of a 10m drift fence and large buckets.

The pitfall arrays were checked at dawn and remained *in situ* for a total of four consecutive days between 25th and 28th March 2024.

4.3.2.5 Passive Infra-red (PIR) Cameras

Six Stealthcam STC-G34 infra-red cameras were deployed on site for a period of 46 nights which included 276 trap nights to target any fauna using the Subject Land.

Three cameras were mounted at approximately two metres high facing a baited tea-strainer to target arboreal species, specifically the Squirrel Glider, Eastern Pygmy Possum and Brush-tailed Phascogale. Bait stations were baited with a mixture of peanut butter and oats and a honey spray used on the trunk of the tree. Baits were replaced after two weeks. The location of the PIR cameras is shown in Figure 8.

4.3.2.6 Spotlighting and Torch Searches

Spotlighting was conducted by two ecologists for one hour per night over two nights. This was undertaken via walking transects across the entire site. A handheld 1100 lumen LED spotlight was used, and the ecologist targeted the trunks and branches of canopy trees and understorey, whilst also periodically scanning the ground.

The target species for spotlighting were the Koala, Squirrel Glider, Eastern Pygmy Possum, Brush-tailed Phascogale and Rufous Bettong and call playback for the Bush-stone curlew.

A total of six person hours of targeted threatened fauna spotlighting surveys was undertaken between 13th and 15th August 2024.

4.3.2.7 Koala Spot Assessment Technique (SAT) surveys

Two dedicated Koala surveys using the Spot Assessment Technique (SAT) were conducted by Principal Ecologist Nigel Cotsell within the Subject Land, see Figure 8.

Each SAT surveys consisted of identifying a centre tree which is known to be frequented by the Koala, known to contain faecal pellets of the Koala or is likely to be considered as a potentially important tree for the Koala. If a tree of this criteria was not located, a centre tree was randomly selected in an area of habitat most likely to support this species.

Once a centre tree was selected, active searches for Koala scats were undertaken under this tree and under the twenty-nine nearest trees. Searches involved checking the ground and leaf litter within a one metre radius of each tree, for a period of two minutes per tree or until a scat was found. This technique is recognised as a very efficient method of detecting Koala presence, and in some instances, is a method used to identify areas of major Koala activity/significance e.g. Core Koala Habitat (Phillips and Callahan 1995; Jurskis and Potter 1997).

Photo Plate 4: Passive Infrared (PIR) Camera targeting threatened Arboreal fauna species

Figure Name: Location of targeted fauna surveys	Location: 171 John Oxley Drive, Port Macquarie	Client: King and Campbel	Biodiversity AUSTRALIA
This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.		Job Number: ENS5978	
		Date: August 2024	Project Manager: KR / Drawn by: JF
		Scale: 1:1700	Spatial Reference: WGS 84 / Pseudo-Mercator

Figure 8: Location of targeted fauna surveys

4.3.3 Survey Timing and Limitations

4.3.3.1 Flora

The survey period fell within the BAM-C prescribed survey period for all target threatened flora species, with the exception of Slender Marsdenia (*Marsdenia longiloba*). However, given the small area and distinctive leaf shape of this vine Bio Aust is confident this species is not located on the Subject Land. The warm conditions and rainfall are likely to have triggered flowering events for almost all the target species listed, making them easily detectable if present.

4.3.3.2 Fauna

Fauna detectability is limited by seasonal, behavioural or lifecycle characteristics of each species, and even by habitat variations (e.g. flowering periods), which can occur within a year, between years, decades, etc. (DEC 2004). Fauna survey periods fell in summer and autumn which is a period of high activity for arboreal mammals, Microchiropteran bats, frogs and birds (DEC 2004).

The survey timing coincided with the recommended survey period for all the targeted candidate fauna species.

4.3.4 Weather Conditions

The weather over the survey period from February to May 2024 was generally fine and sunny, however rainfall and storms also occurred.

Minimum temperatures ranged from 7.5°C to 22.6°C with maximum temperatures of 31.3°C (BOM 2024 - nearest weather station at Port Macquarie Airport No. 60168).

February had the highest monthly rainfall of 205.8mm while the lowest was in May 2024 with 136.8mm. The highest rainfall event was on 6th April when 134.6mm was recorded. Other smaller rainfall events occurred semi-frequently throughout the PIR camera survey period.

Weather during the targeted threatened species surveys (Spotlighting and flora transects) conducted from 13-15 August 2024 was cloudy with occasional scattered light rainfall.

4.4 Targeted Survey Results

4.4.1 Flora

Threatened flora surveys failed to detect the presence of any threatened flora species within the development footprint, however, 10 (ten) occurrences of the threatened flora species *Rhodomyrtus psidioides* (Native Guava) were located along the southern boundary of the broader Subject Land. These were small seedlings grouped within 8m of the record shown in Figure 10. Numerous occurrences of this threatened flora species have been recorded near the subject Land, as shown on the BioNet Atlas search results in Figure 9. Records of *Rhodomyrtus psidioides* within 10km of the Subject Land (BioNet Atlas 2024).

Photo Plate 5: Seedling of *Rhodomyrtus psidioides* (Native Guava) from the Subject Site

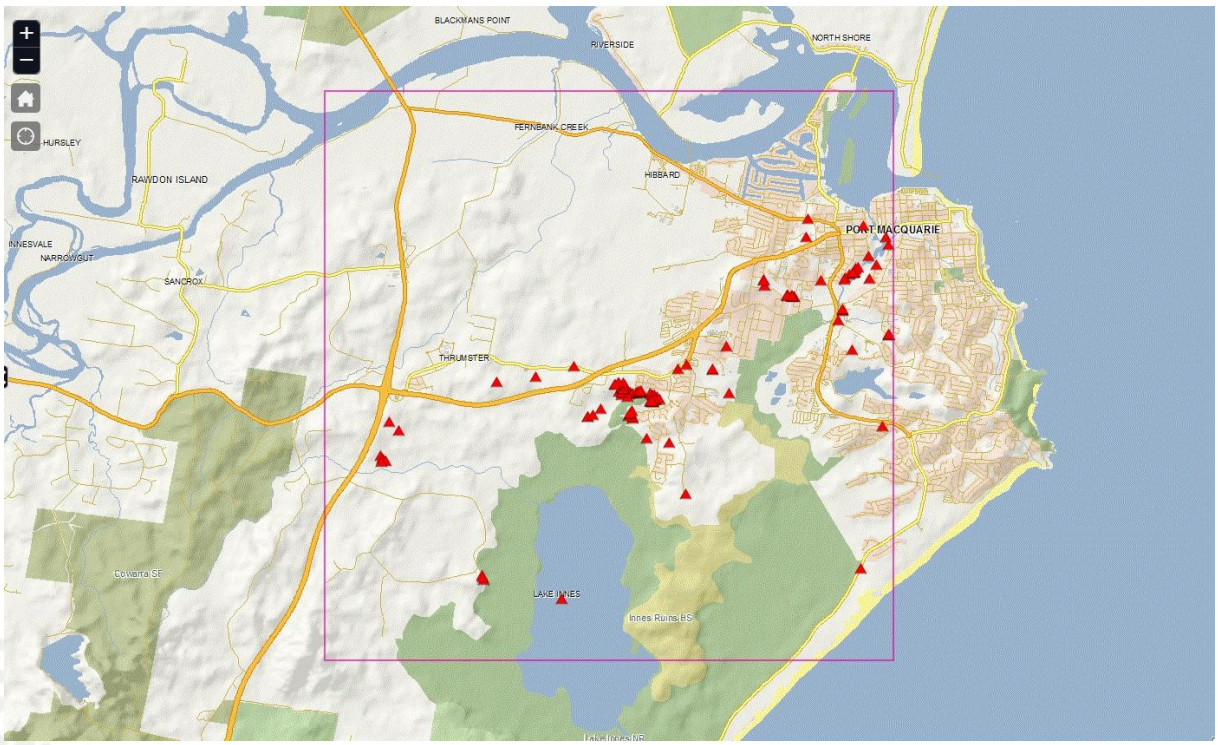


Figure 9. Records of *Rhodomyrtus psidioides* within 10km of the Subject Land (BioNet Atlas 2024).

Figure Name: Location of targeted fauna surveys	Location: 171 John Oxley Drive, Port Macquarie	Client: King and Campbel	Biodiversity AUSTRALIA
This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.		Job Number: ENS5978	
		Date: August 2024	Project Manager: KR / Drawn by: JF
		Scale: 1:1700	Spatial Reference: WGS 84 / Pseudo-Mercator

Figure 10: Location of Native Guava (*Rhodomyrtus psidioides*) on the subject site

4.4.2 Fauna

4.4.2.1 Habitat Features

The Subject Land was found to be in a modified state and included disturbances such as slashing, clearing, recreational activities and weed invasion.

A range of habitat features were recorded which are described in Table 12.

Table 12: Summary of site habitat values

Habitat/ Attribute Type	Vegetation Zone 1	Vegetation Zone 2
	3553 Low	3166 Low
Groundcover	Open groundcover comprising of native and exotic herbs and grasses	Open groundcover comprising of native and exotic herbs and grasses
Leaf litter	Moderate leaf litter for most patches.	Moderate leaf litter for most patches.
Logs and debris	Absent.	Absent
Hollows	Absent	Absent
Nectar Sources	Eucalypt present on the Subject Land would flower throughout the year.	Eucalypt present on the Subject Land would flower throughout the year.
Sap and gum sources	*Corymbia intermedia* present in Zone 1.	Absent
Primary preferred Koala browse trees	Few Koala browse tree comprising *E. tereticornis*	Absent
Allocasuarinas	Absent	Absent
Aquatic/ wetland habitats	Absent	Absent
Fruiting species	Absent	Absent
Forest bird habitat	Absent. The patches of trees present within the zone are small and as such are highly exposed with significant edge effects and no connectivity.	Absent. Forest area in the southern portion of the site is highly disturbed and dense with exotics species.
Caves, cliffs, overhangs, culverts, bridges	Absent	Absent
Small terrestrial prey	Absent. No hollows and Subject Land lacks in groundcovers and dense vegetation to provide nesting opportunity.	Absent. No hollows and Subject Land lacks in groundcovers and dense vegetation to provide nesting opportunity.
Habitat Linkages	Site is mostly surrounded by highly disturbed vegetation and urban infrastructure.	Site is mostly surrounded by highly disturbed vegetation and urban infrastructure. Forest in the southern section may provide some linkage to surrounding areas such as the wetland to the south.

4.4.2.2 Observed/Detected Fauna

The surveys detected a range of fauna species over the Subject Land. Birds were the most common species detected (9), followed by mammals (3).

No threatened fauna species were detected during the survey.

4.4.3 Species Credit Species

4.4.3.1 Species detected

The following table provides a list of the candidate species credit species subject to targeted survey.

The remaining targeted candidate species credit species were not detected on the Subject Land. Details of each of these are presented in Table 13: Species credit species (fauna) survey results.

Table 13: Species credit species (fauna) survey results

Common Name	Credit Class	Habitat components	Are habitat components met?	Are survey timing constraints met?	Species detected?
Candidate species credit species					
Aepyprymnus rufescens Rufous Bettong	Species	N/A	Yes	Yes	No
Allocasuarina thalassoscopica	Species	N/A	Yes	Yes	No
Burhinus grallarius Bush Stone-curlew	Species	Fallen/standing dead timber including logs	No	Yes	No
Cercartetus nanus Eastern Pygmy-possum	Species	N/A	Yes	Yes	No
Cynanchum elegans White-flowered Wax Plant	Species	N/A	Yes	Yes	No
Eucalyptus largeana Craven Grey Box	Species	N/A	Yes	Yes	No
Haloragis exalata subsp. Velutina Tall Velvet Sea-berry	Species	N/A	Yes	Yes	No
Marsdenia longiloba Slender Marsdenia	Species	N/A	Yes	No	No
Niemeyera whitei Rusty Plum, Plum Boxwood	Species	N/A	Yes	Yes	No
Parsonsia dorrigoensis Milky Silkpod	Species	N/A	Yes	Yes	No
Petaurus norfolcensis Squirrel Glider	Species	N/A	Yes	Yes	No

Common Name	Credit Class	Habitat components	Are habitat components met?	Are survey timing constraints met?	Species detected?
Phascogale tapoatafa Brush-tailed Phascogale	Species	N/A	Yes	Yes	No
Phascolarctos cinereus Koala	Species	Presence of koala use trees	Yes	Yes	No
Planigale maculata Common Planigale	Species	N/A	Yes	Yes	No
Pomaderris queenslandica Scant Pomaderris	Species	N/A	Yes	Yes	No
Rhodamnia rubescens Scrub Turpentine	Species	N/A	Yes	Yes	No
Rhodomyrtus psidioides Native Guava	Species	N/A	Yes	Yes	Yes
Senna acclinis Rainforest Cassia	Species	N/A	Yes	Yes	No
Solanum sulphureum Manning Yellow Solanum	Species	N/A	Yes	Yes	No

STAGE 2 - IMPACT ASSESSMENT

5. Avoidance and Minimisation

5.1 Impact Avoidance

The Subject Land is zoned as R1 – General Residential and C2 – Environmental Conservation. The design includes a pragmatic and iterative approach to avoiding areas of high biodiversity value or mapped as C2 zoning. The concept design for the site was originally a residential subdivision, which sought to remove 100% of the vegetation from the Subject Land. However, through field investigations and development of the South Lindfield Local Environmental Plan (Planning Proposal) Biodiversity Australia identified several key biodiversity values which formed a priority for avoidance. This was communicated with the proponent at that time and the PMHC Council through a series of informative stakeholder meetings and key geospatial information was delivered to the proponent's design team for design alterations. Ultimately, these design considerations resulted in the making of the South Lindfield Local Environmental Plan (rezoning), South Lindfield Koala Plan of Management (KPoM) and South Lindfield VPA.

Subsequently, the proponent sold the Subject Land to the Point Community Church who is seeking development of the Site for a place of public worship, associated car park and construction of the Annabella Drive connection.

The Subject Land contains areas of suitable habitat for the Koala. The total area of suitable habitat within the Subject Land is approximately 1.417 ha. Of this, 0.25 ha occurs within the Development Footprint that includes the Annabella Drive road connection, as required by the DCP and South Lindfield VPA. The 0.25ha includes 22 scattered and isolated, mature Eucalypts. Whilst this will ultimately reduce the availability of potential habitat for the species, this is considered minor when compared to the extent of habitat left remaining in the southern half of the Subject Land that is to be rehabilited and managed in accordance with the VMP and ultimately dedicated to Council as public reserve

This 0.25 ha of impacted potential Koala habitat has been nominated for offsetting through the BOS in accordance with the BAM.

5.2 Direct Impacts

5.2.1 Vegetation and Habitat Removal

There will be approximately 0.98 ha of vegetation (Trees, shrubs and groundcover) removal associated with the proposed works. No further vegetation loss will be required through the operational phase of the development. This loss will be offset through biodiversity credits. The area of Biodiversity Values in the western portion of the Subject Land (Figure 3) will be used for offset planting and will improve its current ecological function.

The vegetation to be affected may provide foraging habitat for a number of fauna species. This includes nectar and prey habitat for birds, Microbats and flying foxes. The hollow-bearing trees have the potential to provide nesting/denning habitat for hollow-obligate fauna species.

5.3 Indirect Impacts

The following potential indirect impacts may be associated with the proposal:

5.3.1 Fragmentation

The removal of vegetation for the Development Footprint will result in a minor, localised increase habitat loss and fragmentation. Fragmentation of faunal habitat has the potential to impact the dispersal of fauna, modify gene flow and alter the microclimate in the area by directly reducing accessibility to habitat and increasing the area of vegetation subject to edge effects (Battisti 2003; Offerman *et al* 1995; Saunders *et al* 2012). Fragmentation and the associated landscape changes at all scales is a major factor in the decline of biodiversity, the modification of ecosystems, and alteration of ecosystem processes. Its effects vary with factors such as distance of fragments from similar habitat, their position in the landscape, the forms of habitat modification of isolates that occurs (e.g. due to edge effects), and types of surrounding land uses in the matrix, the ecology of the species affected, and how these factors influence the movement of organisms between the isolates and larger areas of habitat (Lindenmayer and Fisher 2006, DPE 2020b).

The vegetation requiring removal for the proposed Development Footprint represents 22 mature and semi-mature Eucalypts from an isolated grassland. The shape of the Development Footprint and its context in the broader landscape shows that it does not hold significant value for fauna movement, with the John Oxley Highway and residential developments located to the north, east and west. The surrounding landscape is largely fragmented by local infrastructure networks and house developments, except for minor habitat connectivity extending south into the Lake Innes Nature Reserve. This area remains partially connected to vegetation in the south of the Subject Land. Considering all works are proposed within the northern extent of the Subject Land, no impacts to fauna movement south towards the Nature Reserve are anticipated as a result of the proposed works.

5.3.2 Erosion and Sedimentation

Sedimentation and erosion impacts can occur at both the construction and establishment phases. Erosion/sedimentation may occur via erosion of fill material and disturbed soils, scouring of exposed soil, earthen banks and habitats adjacent to the development area via directed flow (e.g. stormwater), or where runoff is concentrated. If unmitigated, these can lead to the reduction water quality of downstream waterways and cause siltation, having flow-on effect to flora and fauna (Queensland Government 2019).

No wetlands, watercourses or drainage line occurs within the Development Footprint. As such, impacts to watercourses resulting from erosion and sedimentation are likely to be minor. Regardless, standard mechanisms and controls will be required to ensure the prevention of erosion and sedimentation during construction and post-development and such impacts do not extend beyond the development footprint. The development of a Soil Erosion & Sediment Control Plan (SESCP) developed by a Certified Practitioner in Erosion and Sediment Control is recommended.

5.3.3 Injury/mortality during clearing

Animals within hollows and fallen logs, as well as dense vegetation and leaf litter have the potential to be injured or killed during clearing operations. Such fauna may be placed under stress, injured or killed during tree felling via:

- Being nocturnal or in torpor, and unable to escape prior to the tree falling.
- Collapse of the hollow when it impacts the ground.

- Collision with internal walls or via being thrown out when the tree falls.
- Being present as young e.g. eggs.

This risk increases during breeding seasons (generally spring to late autumn) and in cooler seasons when mammals and reptiles are less active and denning.

The Development Footprint does not contain areas of dense groundcover, fallen habitat logs and/or hollow-bearing trees, and therefore, is unlikely to represent a heightened risk of fauna mortality during clearing. Nevertheless, the presence of an ecologist or fauna spotter catch (FSC) will be required during all vegetation clearing to mitigate the risk of injury to fauna. Further detail of the mitigation measures proposed to reduce injury or mortality during clearing is provided in Section 5.5.

5.3.4 Edge effects

Changes to the edges of vegetation communities has been attributed to a range of detrimental effects on different ecosystems. These changes have been linked to effects such as the alteration of environmental conditions, changes in species abundance and distributions and changes in species interactions (Murcia 1995).

The vegetation on the Subject Land is currently exposed to edge effects of differing severity depending on the neighbouring land use. Some areas are heavily modified due to long term slashing (the Development Footprint) and others are in a relatively mature and self-sufficient state. The areas of vegetation which are most sensitive is that located in the south of the Subject Land that is mapped as Biodiversity Values and zoned for C2 – Conservation. Whilst habitats present within the Development Footprint are currently degraded by existing land uses (road networks and residential developments) and hold little ecological value, the proximity of the development to the area of Biodiversity Values means that a there is a risk of edge effects impacts. Potential mitigation measures (fauna awareness signage, weed management and/or fauna fencing) are recommended to be considered during the final design.

5.3.5 Weed invasion

An increase in vehicle and foot traffic within the Subject Land has potential to increase the spread of weeds onto and through the property. The introduction of weeds can have a significant impact on native flora and fauna by altering the balance of natural ecosystems and outcompeting native flora when it comes to necessary sunlight, shade, nutrients and space (DPE 2020d). This can result in long-term effects unless appropriate mitigation and management measures are implemented.

The Subject Land is currently subject to moderate to high levels of weeds. The proposed development may increase the potential for spread of weeds within the Subject Land to some extent. Mitigation measures to limit the potential for spread and minimise impacts from weeds are further discussed in Section 5.5. These include the requirement of weed-free vehicles during construction, the restriction of exotic ornamental plantings for landscaping and the development and implementation of a Weed Management Plan (WMP).

5.3.6 Fauna Vehicle Strike

The proposed development may lead to increased vehicle activity on the Subject Land which has the potential to increase the incidence of fauna vehicle collisions. Studies have shown a significant increase in fauna vehicle strike incidents where road densities and vehicle speeds

are high, which can result in the direct mortality of fauna (Clevenger *et al* 2002; Gurriga *et al* 2012).

The new road proposed between Annabella Drive for the Development will be of low speeds which are not anticipated to pose a risk to local fauna as they allow for increased fauna detection and greater likelihood of avoided collision. Regardless, fauna awareness signage and safety lighting will be included in the project design to mitigate the risk of fauna collision.

5.3.7 Noise, vibration and anthropogenic disturbances

A significant/frequent increase in noise levels have been documented to impact on behavioural changes, population densities, community structure and breeding success of fauna (Barber *et al* 2009). These responses can result from the frequent disturbance to daily activities via evoking anti-predatory responses as well as by blocking call signals between individuals (Barber *et al* 2009).

The clearing and construction phase of the proposed development is likely to result in increased levels of noise and vibration within and immediately surrounding the Subject Land. This increase in noise and vibration is however only expected to have a minimal effect on local fauna due to the following:

- Noise and vibration levels are unlikely to significantly increase beyond that which already occurs;
- Works will to be diurnal only; and
- The clearing and construction phase is temporary.

Once established, noise and vibration levels will return to levels typical of a residential area which is generally low to nil at night and may potentially peak on weekends. As fauna occurring in and adjacent to the Subject Land are expected to have a substantial tolerance to the current level of anthropogenic noise in the area, long-term impacts are not anticipated.

5.3.8 Light Spill

The introduction of additional artificial light has the potential to effect fauna within and adjacent to the Subject Land. Studies have shown both and increase in orientation and increase in disorientation as a result of additional illumination to an area. This can have the potential to alter normal foraging, communication and reproductive behaviours (Longcore and Rich 2004; Chepesiuk 2009).

During the construction phase, no additional illumination is expected as all works are to be conducted diurnally. Operationally, the new residences may require artificial lighting for security and safety reasons. Artificial lighting is recommended to be kept to a minimum and strategically placed so as not to disturb fauna in adjacent habitats. These mitigation measures are further detailed in Section 5.5.

5.3.9 Introduction of feral and domestic predators

Urban, industrial and rural developments are often associated with the introduction of non-native species i.e. rodents, cats and dogs accidentally and intentionally e.g. via creating habitat for such species (e.g. rats, Indian Myna) as well as pets.

The proposed increase in human activity has the potential to introduce domestic pets to the Subject Land as well as to attract feral animals. Feral cats and foxes are significant predators of native species (NPWS 2001, DPE 2020b), and domestic dogs are significant threats to species (Wilkes and Snowden 1998, Connell Wagner 2000). These species are known to have a negative impact on native fauna by competing for food and shelter, destroying habitat, predation and by spreading disease (DAWE 2020c) however the mere presence of these predators alone has also been shown to affect fauna behaviour e.g. avoidance and range contraction. The impacts from the introduction of these species have been listed as key threatening processes under the *BC Act*.

The proposed development will see an increase in human activity in the Subject Land, however it is located directly adjacent to an existing residential area and situated amongst several broader residential zones. Based on the current human presence in the wider locality, the potential to attract increased numbers of feral animals to the Subject Land is likely to be minimal. If unmitigated, domestic predators would pose a greater risk to native fauna in nearby habitats. Mitigation of this risk is recommended through the restriction of domestic pets to fenced yards.

5.3.10 Movement obstruction

Fences have potential to obstruct the movement of threatened fauna across the Development Footprint. Some threatened fauna can be injured by collision with wire fences, particularly barbed wire e.g. the Yellow-bellied Glider, owls and Squirrel Glider have been recorded being injured by barbed wire fences (Lindenmayer 2002).

Temporary and permanent fencing to be constructed for the proposed development has the potential to restrict fauna movements (e.g. colorbond) or inflict injury (e.g. barbed wire fence). Mitigation measures to eliminate this risk have been outlined in Section 5.5.

5.3.11 Increased dust levels

The driveways proposed for the development are to be sealed, hence, dust levels are not anticipated to increase as a result of the proposed development. There may be an increase in dust during the construction phase of the project, however this will be managed through a Construction Environmental Management Plan (CEMP).

5.3.12 Increased risk of starvation

The vegetation proposed for removal comprises scattered patches of canopy vegetation amongst a greater area of pasture grassland and heavily supressed forested wetland. With the limited vegetation proposed to be removed and the vast areas of perpetually protected vegetation within the study area / locality, food resources are not anticipated to decrease to a level that will pose a risk of starvation to fauna.

5.3.13 Critical loss of shade or shelter

Whilst the proposed works will require the removal of 25 mature and semi-mature eucalypts, this is unlikely to lead to a critical loss of shade or shelter due to the limited extent of vegetation to be removed and vastness of adjoining habitats. These trees are currently located in in isolate positions amongst exotic grassland.

5.3.14 Increased soil salinity

An increase in soil salinity can be detrimental to native species with surfaced salts becoming toxic to a large majority of native flora. An increase in soil salinity has been linked to large-scale land clearing and is usually associated with agricultural clearing (Australian Bureau of Statistics 2013). The proposed development is considered too small to affect soil salinity and the development is not in use as agricultural land.

5.3.15 Rubbish dumping

The risk of rubbish dumping is not anticipated to increase as a result of the proposed development. Suitable waste disposal facilities will also be provided as part of the development.

5.3.16 Wood collection

All materials required for the development will be sourced externally and wood resources to remain on the Subject Land are considered too sparse to attract wood collection.

5.3.17 Bush rock removal and disturbance

No bush rock was recorded within the Subject Land.

5.3.18 Increased risk of fire

The proposed development will not increase the risk of fire in the area.

5.4 Prescribed Impacts

The following potential indirect impacts have been considered and determined to not be associated with the proposal:

5.4.1 Karst, Caves, Crevices, Cliffs, Rocks and Other Geological Features of Significance

The Subject Land does not contain features such as karst, caves, crevices, cliffs, rocks or other significant geological features of that kind.

5.4.2 Human-made Structure and Non-native Vegetation

The Subject Land does not contain human-made or non-native vegetation that provides meaningful habitat to threatened species

5.4.3 Habitat Connectivity

The Subject Land does not fall within a mapped regional corridor (Figure 5). On a more local scale, forested areas of much high vegetation integrity occur on adjacent land which provide connectivity towards lake Innes Nature Reserve (south of the Subject Land). The Development Footprint itself does not hold significant connectivity value.

The vegetation requiring removal for the proposed Development Footprint represents 22 mature Eucalypts from an isolated grassland. The shape of the Development Footprint and its context in the broader landscape shows that it does not hold significant value for habitat connectivity, with the John Oxley Highway and residential developments located to the north,

east and west. The surrounding landscape is largely fragmented by local infrastructure networks and house developments, except for minor habitat connectivity extending south into the Lake Innes Nature Reserve. This area remains partially connected to vegetation in the south of the Subject Land. Considering all works are proposed within the northern extent of the Subject Land, no impacts to habitat connectivity south towards the Nature Reserve are anticipated as a result of the proposed works.

5.4.4 Water Bodies, Water Quality and Hydrological Processes

The Subject Land does not contain any waterbodies, wetlands, creek or drainage lines. As such, no impact to waterbodies, water quality or hydrological processes is likely to occur.

5.4.5 Wind Farm Developments

The proposed development is not a wind farm development.

5.4.6 Vehicle Strike

The proposed development may lead to increased vehicle activity on the Subject Land which has the potential to increase the incidence of fauna vehicle collisions. Studies have shown a significant increase in fauna vehicle strike incidents where road densities and vehicle speeds are high, which can result in the direct mortality of fauna (Clevenger et al 2002; Gurriga et al 2012).

The new road proposed for the development (Annabella Drive connection) will be of low speeds which are not anticipated to pose a risk to local fauna as they allow for increased fauna detection and greater likelihood of avoided collision. Furthermore, fauna awareness signage and safety lighting will be included in the project design to mitigate the risk of fauna collision.

5.5 Measures to Minimise Impacts

The proposal would be subject to a number of mitigation measures and environmental controls to reduce the overall impact of the development on biodiversity and ensure potential offsite impacts are minimised. The conclusions of this assessment have assumed that these will be implemented.

5.5.1 Protection and Rehabilitation of the Biodiversity Values Area

The southern half of the Subject Land contains an area of Biodiversity Values (Figure 3. This area correlates with mapped Swift Parrot important area mapping. The design of the proposed development has intentionally avoided this area. In addition, it has been recommended that the area is used for the required offset planting under the South Lindfield KPoM. This area will undergo full ecological restoration in accordance with an approved VMP. This will provide the function of increased Koala habitat. The details of this restoration are detailed within a Vegetation Management Plan.

5.5.2 Vegetation Management Plan

A Vegetation Management Plan (VMP) has been prepared (Biodiversity Australia 2024) to manage the rehabilitation of native vegetation in the southern half of the Subject Land (outside the Development Footprint). The BA VMP report details the works required, offset requirements,

timeframes, parties responsible for implementing the works and cost estimates to carry out the works. It will also detail monitoring future monitoring requirements for the site.

5.5.3 General Clearing Measures

The following measures are recommended to manage clearing:

- Site induction is to specify that no clearing is to occur beyond the marked area. All vehicles are only to be parked in designated areas.
- Clearing and earthworks is to avoid damage to root zones of the retained trees.
- No materials or fill are to be placed under retained trees or within adjacent vegetation.
- Weeds are not to be mulched with native vegetation and should be taken to a licenced landfill facility.

5.5.4 Offset Tree Planting

The offsetting required for the proposed development are detailed within Section 6.4.3 and are determined by the South Lindfield Koala Plan of Management 2018 (KPoM). In accordance with the KPoM Section 7.12, koala feed trees must be replanted at a 2:1 ratio. As such, 22 trees are proposed for replanting to offset the 12 semi-mature trees to be removed from the Development Footprint. Specifics of this planting are described within the VMP recommended within Section 6.4.3.

5.5.5 Soil Erosion and Sedimentation Control

Standard soil and sedimentation control measures will be required throughout the earthworks phase to ensure that habitats in the Subject Land, as well as subsequent habitats nearby are not substantially affected. It is recommended that a Soil Erosion and Sediment Control Plan be developed by a Certified Practitioner in Sediment and Erosion Control to meet all standard compliance as well as provide specific protections for the mapped wetland in the proximity of the Subject Land.

Proposed drainage systems need to be adequately designed and effectively established to prevent the risk of any substantial impacts (e.g. erosion and sedimentation, changed hydrology from stormwater runoff) as per statutory obligations.

5.5.6 Pre-clearing Survey and Clearing Supervision

The clearing extent is to be inspected for fauna by a qualified ecologist immediately prior to commencement of any vegetation removal involving machinery and/or tree-felling. This is to occur each morning if clearing spans over multiple days/weeks. Pre-clearing checks would include searches of habitat (e.g. lifting and destructive searches of logs) and searches for bird nests. If possible, any detected fauna is to be relocated off-site to nearby suitable areas (preferably within their natural home range) prior to clearing.

During the pre-inspection, any habitat features detected (e.g. hollows, logs, nests) are to be clearly marked with flagging tape to allow easy identification during clearing. The ecologist is to be present on site to supervise all clearing works to retrieve any fauna detected during works and undertake appropriate action (e.g. humanely euthanise severely injured animals and/or relocate uninjured animals where possible). The fauna spotter must also be present during de-

watering of any water bodies on the site to rescue and relocate and stranded aquatic fauna species.

A report detailing the results of the clearing monitoring is to be provided to the consent authority within 14 days of works completion.

5.5.7 Weed Control

Disturbance of the Subject Land soil layers have potential to encourage weed invasion. Hence, it is recommended that:

- Disturbance of vegetation and soils on the site should be limited to the areas of the proposed work and should not extend into adjacent vegetation;
- All plant used for clearing and construction works is certified as weed free;
- Appropriate collection and disposal of all weed material removed via clearing;
- Any recent weed invasions within the development area should be removed, and
- Ongoing weed control in the development area.

5.5.8 Artificial Lighting

To ensure anthropogenic impacts are minimised, it is recommended that artificial lighting be kept to a minimum and be of a localised and low luminosity, with light directed to the ground and not onto retained trees/adjacent vegetation. Sufficient artificial lighting will likely be required for security reasons and in the event any evening works are required. Security lighting is preferred to be sensor-based to reduce energy consumption and contributions to Climate Change.

5.5.9 Fencing

Temporary and/or permanent fencing may be required for the duration of construction of the place of public worship. It is important to note that fences have potential to obstruct the movement of fauna across the site. Any fencing required should be Koala friendly and permeable unless required to confine domestic pets to backyards. Ideally, dogs should be restricted within a fence which prevents fauna access but permits their escape (e.g. by a wooden post). No fencing that could pose a barrier or risk of entanglement to fauna (e.g. barbed wire) is to be used.

5.5.10 Domestic Animals

In order to reduce potential predation or attack to native fauna for the duration of construction activities, it is recommended that domestic dogs are restricted to fenced yards and domestic cats are not allowed to roam in adjoining vegetation.

5.5.11 Landscaping

Any landscaping proposed as part of the development should give due consideration to the establishment of native plants as ornamental species to maintain and/or increase biodiversity, provide replacement habitat, and maximise water efficiency.

Recommended species for planting should include locally indigenous *Eucalypts*, *Angophoras*, *Grevilleas*, *Banksias*, *Melaleucas*, *Acacias*, *Allocasuarinas* and *Callistemons* (especially Winter-flowering species which are useful for the Little Lorikeet, gliders, honeyeaters and Grey-headed Flying Fox e.g. *Banksia integrifolia*); and fruiting rainforest species such as Brush Cherry (*Syzygium australe*), figs, *Acronychia spp, Cryptocarya spp*, etc.

Where possible, plantings should preferably not be in parkland style or isolated trees as this minimises their effectiveness to provide habitat to all but common medium sized species (e.g. Currawongs and Indian Mynas) and may become detrimental to the presence of other species (Catterall 2004). Rather, plantings should be planned to recreate a natural structure (i.e. layered). Such plantings thus would consist of at least one or two canopy trees, underlain by scattered understorey trees, and finally a number of shrubby species. This multi-layered planting can provide effective aesthetics while supporting passerine birds (who depend on the lower stratums and structural complexity), microbats, and canopy species such as birds and arboreal mammals (Catterall 2004).

5.5.12 Mitigation Measure summary

The following table provides a summary of the mitigation measures and the timing and responsibility.

Table 14: Mitigation measure summary

Mitigation measure	Responsibility
Prior to clearing works	
Define clearing limits on site with bunting or temporary fencing	Clearing contractor / surveyor
Site inductions to clearing contractors re. ecology measures	Project ecologist
Preparation of VMP	Ecologist/Project coordinator
Installation of replacement nest boxes and report	Project ecologist
Sediment and erosion control measures	Clearing contractor
Ensuring all plant is weed free	Clearing contractor
Pre-clearing survey and habitat tree mark-up	Project ecologist
During clearing works	
Pre-clearance inspection (each morning prior to clearing)	Project ecologist
Clearing supervision	Project ecologist
Hollow-bearing tree removal protocol	Clearing contractor/Project ecologist
Maintain sediment and erosion control measures	Clearing contractor
Removal of weeds and disposal at a licenced landfill facility	Clearing contractor
Monitoring of extent of clearing works i.e. no clearing beyond marked footprint (continual)	Project coordinator
Post clearing works	
Implement VMP	Bush regenerator/ Ecologist
Removal of any new weed infestations and ongoing weed control in E2	Bush regenerator/ Ecologist
Restriction of access to E2 and educational signage	Project coordinator
Strategic placement of artificial lighting	Project coordinator
Restriction of domestic animals	Project coordinator/Owner/Occupants

Mitigation measure	Responsibility
Restriction of exotic species in landscaping	Project coordinator

6. Impact Summary

6.1 Assessment of Serious and Irreversible Impacts

6.1.1 Identification of SAII Entities

Section 6.5 of the *Biodiversity Conservation Act 2016* (BC Act) requires developments to consider Serious and Irreversible Impacts (SAII) on threatened species and ecological communities which meet the following criteria:

- Are in a rapid rate of decline;
- Have a very small population size;
- Have a very limited geographic distribution; and
- Are unlikely to respond to measures to improve habitat.

These criteria have been applied to all threatened species and ecological communities listed under the *BC Act*. Entities that meet the criteria under one or more principles are identified as 'potential' SAII species/communities, as per the *Guide to assist decision-maker to determine a serious and irreversible impact* (OEH 2017b).

None of the ecosystems or species credits species impacted by this proposed activity are listed as SAII. As such, no further assessment in relation to SAII has been undertaken.

6.2 Ecosystem Credits

Table 15 details the credit requirement for the vegetation zones that will be impacted by the development. The full credit report is provided in Appendix A-1.

6.3 Species Credits

No species that will be impacted by the development, and therefore no credits are required.

Table 15: Ecosystem credit requirements

Zone	Vegetation Zone	TEC name	Vegetation integrity score	Vegetation integrity (+/-)	Area (ha)	Sensitivity to loss (Justification)	Sensitivity to gain class	BC Act	EPBC Act	Biodiversity risk weighting	Potential SAII	Ecosystem credits
PCT 3166 Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest of the NSW North Coast Bioregion												
1	Heavily modified	Not a TEC	11.5	-11.5	0.13	PCT Cleared – 8%	High Sensitivity to Potential Gain	Not Listed	Not Listed	1.5	False	0
3	Derived grassland	Not a TEC	9	-9	0.32	PCT Cleared – 8%	High Sensitivity to Potential Gain	Not Listed	Not Listed	1.5	False	0
											Subtotal	**0**
PCT 3553 Northern Sands Bloodwood-Swamp Turpentine Forest of the NSW North Coast Bioregion												
2	Heavily modified	Not a TEC	23	-23	0.14	PCT Cleared - 94%	High Sensitivity to Potential Gain	Not Listed	Not Listed	2.5	N/A	2
4	Derived grassland	Not a TEC	3.7	-3.7	0.39	PCT Cleared - 94%	High Sensitivity to Potential Gain	Not Listed	Not Listed	2.5	N/A	0
											Subtotal	**0**
											Subtotal	**2**
											Total	**2**

6.4 South Lindfield KPoM Assessment

6.4.1 Koala Food Trees (KFTs)

BioNet results show numerous records of a Koalas sighted nearby and a single sighting within the Subject Land, see Figure 11. Field surveys identified 22 mature Eucalypts within the Development Footprint, including 12 listed as KFTs in the South Lindfield KPoM (Figure 122). Of these, four (4) were listed as juveniles with a DBH less than 10cm.

Table 16: Preferred KFTs per soil landscape within the Port Macquarie LGA

Soil Landscape	Transferral, Alluvial, Swamp and Thrumster	Erosional, other Residuals, Colluvial, Beach and Aeolian.
Fertility	Medium to High Fertility	Low to Medium
KFT species	Forest Red Gum (*Eucalyptus tereticornis*) Tallowwood (*E. microcorys*) Swamp Mahogany (*E. robusta*) Grey Gum (*E. propinqua*)	Tallowwood (*E. microcorys*) Swamp Mahogany (*E. robusta*)

6.4.2 Koala habitat

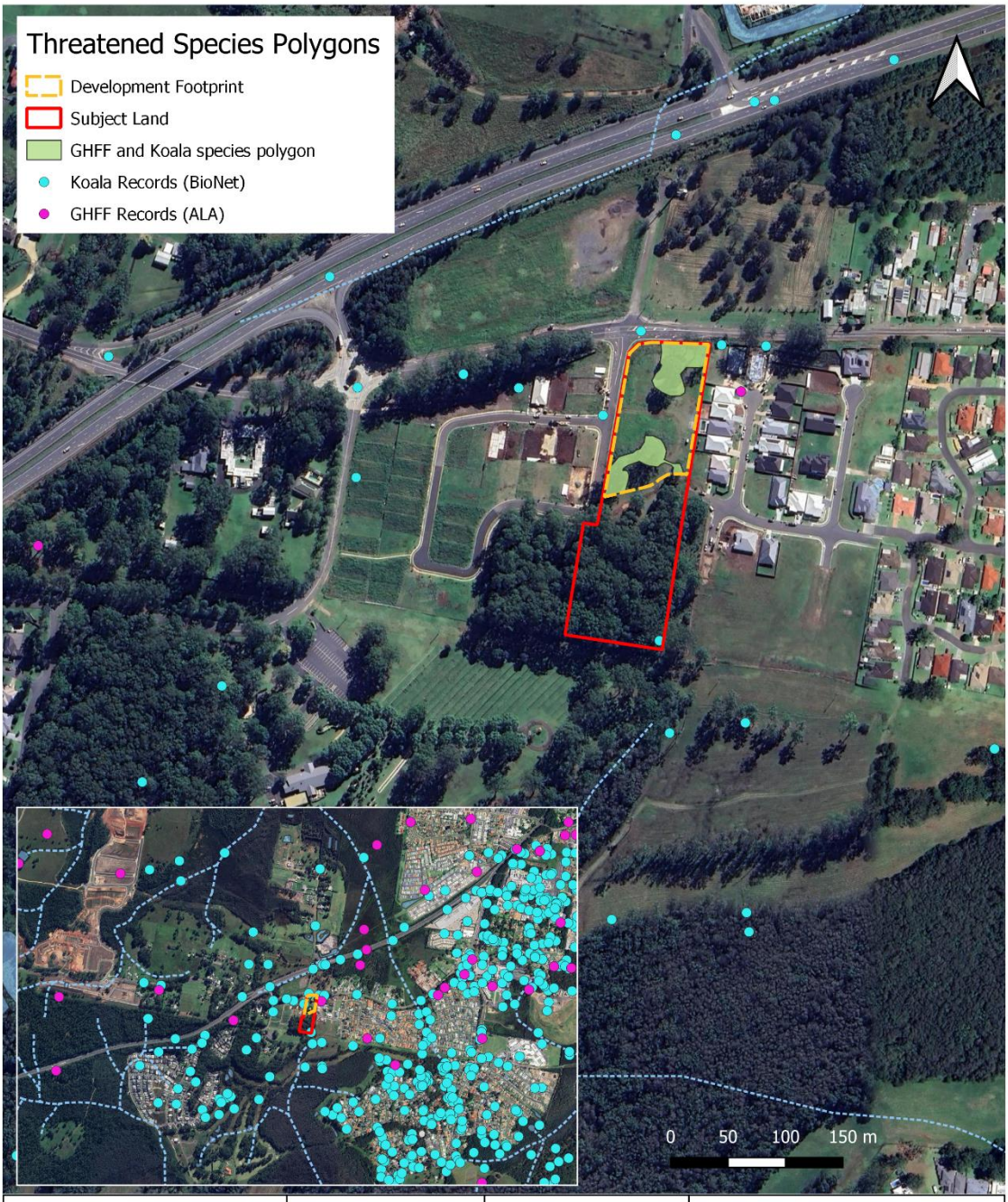
6.4.3 Offsetting

Section 7.1.2 of the South Lindfield KPoM states that all impacted Koala Feed Trees are required to be offset at a ratio of 2:1.

In accordance with the KPoM, the replantings are to comprise Tallowwoods, Forest Red Gum and/or Swamp Mahogany, with species selection targeting suitable edaphics at the planting location. All Koala offset plantings will be located in available canopy spacings within the retained vegetation in the south the Subject Land and planted out at 10m spacings with accompanied mid and ground storey plantings. All plantings are to be maintained in perpetuity with any failures to be replaced in accordance with this KPoM.

Any offset planting that is required outside this KPoM area will require Council agreement, a Vegetation Management Plan and maintenance program. All plantings will be managed and monitored as per the specifications in Appendix 1 of the South Lindfield KPoM.

Figure 13 shows indicative proposed replanting locations.



This mapping is to be considered indicative only and all derivations (eg of areas of EECs and vegetation communities) are at best approximations and subject to errors including individual interpretation and reliance on information provided to Biodiversity Australia where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping, ect. should be placed upon this map without independent validation of the information by the user. Biodiversity Australia takes no responsibility for any sudsequent error losses etc. that may arise from use of this data without independent verification.	Project Manager: KR	Figure Name: Threatened Species Polygons	Biodiversity AUSTRALIA
	Drawn By: HR	Site: 171 John Oxley Drive, Port Macquarie	Job Number: ENS5978 / Scale: 1:5,000
	Date: July 2024	Client: King and Campbell	Spatial Reference: MGA Zone 56/GDA2020

Figure 11: Threatened species polygon

This mapping is to be considered indicative only and all derivations (eg of areas of EECs and vegetation communities) are at best approximations and subject to errors including individual interpretation and reliance on information provided to Biodiversity Australia where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping, ect. should be placed upon this map without independent validation of the information by the user. Biodiversity Australia takes no responsibility for any sudsequent error losses etc. that may arise from use of this data without independent verification.	Project Manager: KR	Figure Name: KFTs within the Development Footprint	Biodiversity AUSTRALIA
	Drawn By: HR	Site: 171 John Oxley Drive, Port Macquarie	Job Number: ENS5978 / Scale: 1:1,000
	Date: July 2024	Client: King and Campbell	Spatial Reference: MGA Zone 56/GDA2020

Figure 12: KFTs within the Development Footprint

Figure Name: Planting area and locations of proposed replantings	Location: 171 John Oxley Drive, Port Macquarie	Client: King and Campbel	Biodiversity AUSTRALIA
This mapping is to be considered indicative only and all derivations (e.g., vegetation communities) are best approximations and subject to errors including individual interpretation and reliance on information provided to Bio Aus where were not independently verified. All information is intended to be indicative only and no reliance for extrapolation, mapping etc. should be placed upon this map without independent validation of the information by the user. Bio Aus takes no responsibility for any subsequent error losses etc. that may arise from the use of this data without independent verification.		Job Number: ENS5978	
		Date: August 2024	Project Manager: KR / Drawn by: JF
		Scale: 1:1700	Spatial Reference: WGS 84 / Pseudo-Mercator

Figure 13: Proposed replantings within the Subject Land

7. Conclusion

This report has assessed the impact of a place of public worship on Lot 22 DP1296583, 171 John Oxley Drive, Port Macquarie (the Subject Land). The Subject Land is 1.851 ha. The Development Footprint is located on the northern half of the Subject Land, of approximately. 0.98ha.

The northern section of the Subject Land is zoned R1 – General Residential, whilst the southern half is C2 – Environmental Conservation. The area of land zoned R1 is 0.98 ha including the extension of Annabella Drive which contains 1,289m2 in that area of the Development Footprint. Approximately 0.86 ha of the Subject Land is zoned as C2.

The Subject Land and Development Footprint is zoned R1 – General Residential and the extent of clearing required exceeds the clearing threshold prescribed under the Biodiversity Assessment Method 2020 (BAM). A Biodiversity Development Assessment Report (BDAR) is therefore required to submit with the development application.

Two (2) vegetation communities (PCTs) were identified in the Development Footprint, and these were separated into four (4) distinct vegetation zones. The total area of native vegetation that will require removal for the development is 0.98 ha. This impact is recommended to be offset through purchase and retirement of 2 ecosystem credits (PCT 3553 Northern Sands Bloodwood-Swamp Turpentine Forest) as described in this report (Section 6.2) and implementation of a Vegetation Management Plan (BA 2024).

Biodiversity Australia was requested to prepare a Vegetation Management Plan (VMP Section 5.5.2) to mitigate against the impacts identified in this BDAR, and to ensure the appropriate management of vegetation within the Subject Land. The VMP describes locations and objectives of two Environmental Management Units (EMUs). The VMP also contains a native species planting list, aims and objectives, project activities such as weed control, rehabilitation, performance criteria and a project work plan for the implementation and duration of the VMP. In addition, the VMP sets out requirements for monitoring and reporting, as well as compliance with regulations and the long-term maintenance and security of vegetation within the EMUs.

Biodiversity Australia's VMP forms an integral part of the BDAR mitigation measures designed to avoid and minimise impacts from the development on biodiversity values located within and adjacent to the Subject Land.

An area of Biodiversity Values associated with important areas for 'Threatened species or communities with potential for serious and irreversible impacts" occurs in the southern half of the Subject Land. This area has intentionally been excluded from Development Footprint and will not be impacted by the proposed works. Rather, vegetation management has the potential to increase the quality of habitat for native species.

The Development Footprint does not contain any EECs, Coastal Wetlands or Serious and Irreversible Impacts. Furthermore, no threatened flora or fauna species were detected within the Development Footprint despite targeted survey by suitably qualified BAM accredited assessors.

Direct impacts of the proposal will be limited to vegetation and habitat removal. A number of mitigation measures will be implemented to reduce potential offsite impacts during the construction phase. Indirect impacts that may be associated with the proposal are considered to be minor and can be mitigated through the measures described in this report.

Assessment of the proposal has been undertaken against the South Lindfield Koala Plan of Management 2018. The Development Footprint was found to contain areas mapped as 'Garden Plantings' with several scattered areas of 'Dry Sclerophyll Forest', which represents isolated trees. Vegetation Community and Koala Habitat Assessments were carried out over the Development Footprint which determined that floristic composition, in many areas, did not meet the definition of Preferred Koala Habitat, however 22 mature Eucalypts (representing 12 Koala Feed Trees) were tagged within the Development Footprint. These trees will be offset in the south of the Subject Land at a 2:1 ratio, and therefore, the proposal has demonstrated compliance with the Ameliorative Measures described within Section 7 of the KPoM.

The MNES significance assessments carried out for the proposed development determined that the proposal is not expected to significantly impact upon any of the known or potentially occurring threatened species on the Subject Land. Consequently, the proposal is not considered to require referral to the DCCCEEW for approval under the EPBC Act 1999.

8. References

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Appendices

A-1 EPBC Act MNES Assessment

A-1-1 General Assessment Overview

The provisions of the *EPBC Act* (1999) require determination of whether the proposal has, will or is likely to have a significant impact on a "matter of national environmental significance". These matters are tabulated in the following table.

Table 17: Matters of National Environmental Significance search results

Category	Result	Description
World Heritage Properties	No	-
National Heritage Places	No	-
Wetlands of International Importance	No	-
Great Barrier Reef Marine Park	No	-
Commonwealth Marine Area	No	-
Listed TECs	6	One listed TECs has potential to occur within the assessment area, Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions. The presence of this community is assessed in the sections below.
Listed Threatened Species	95	The likelihood of occurrence and the requirement for an assessment of significance for these species is presented in the sections below.
Listed Migratory Species	68	Migratory wetland, terrestrial and marine species or species habitat known/likely/may occur within the area. Assessment of their likelihood to utilise the Development Footprint is presented below.

The protected matters search tool (DAWE 2024) identified a range of MNES that could potentially occur in the locality. Threatened species and ecological communities listed as MNES were recorded in the study area during the field surveys. These are discussed in the following sections.

A-1-2 Potential Occurrence Assessment (Communities)

The following tables are used as a summary to address Threatened Ecological Communities (TECs) in terms of potential occurrence and requirement for formal assessment. Characteristics of the Subject Land have been compared to DAWE conservation advice for each community to determine whether it conforms to the prescribed definitions.

Table 18: Potential occurrence assessment (communities)

Community Name	Threatened Category	Key Determining Characteristic	Comments	Significance Assessment Required?
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	This community is described as varying from a tall open forest to woodland, with the tree canopy dominated by eucalypts such as *Corymbia, Angophora, Lophostemon* and *Syncarpia*. *Melaleuca* and *Leptospermum* dominate the understory. Groundcover is generally more diverse than surrounding communities and a high number of leaf litter and fallen logs.	No PCTs within the Development Footprint conform to the floristic characteristics of the Coastal Swamp Oak TEC. PCT 3553 is listed as potential PCT for this TEC within the Development Footprint. However, as the site is highly urbanised and has a high presence of exotic species of grasses with little shrub cover it would not be suitable to assign PCT 3553 in this instance to this TEC.	No
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	The Coastal Saltmarsh ecological community consists mainly of salt-tolerant vegetation (halophytes) including: grasses, herbs, sedges, rushes and shrubs. Succulent herbs, shrubs and grasses generally dominate, and vegetation is generally of less than 0.5 m height	No PCTs within the Development Footprint conform to the floristic characteristics of the Coastal Saltmarsh TEC. PCT	No
Lowland Rainforest of Subtropical Australia	Critically Endangered	The ecological community is generally a moderately tall (≥20 m) to tall (≥30 m) closed forest (canopy cover ≥70%). Tree species with compound leaves are common and leaves are relatively large (notophyll to mesophyll). Typically, there is a relatively low abundance of species from the genera *Eucalyptus*, *Melaleuca* and *Casuarina*. Buttresses are common as is an abundance and diversity of vines.	The Development Footprint does not contain the required vegetation composition or structure to conform to the Lowland Rainforest TEC	No
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	The canopy is typically dominated or co-dominated by *Melaleuca quinquenervia* and/or *Eucalyptus robusta*. Occurs on hydric soils with inundation patterns ranging from intermittent to episodic. The vegetation structure varies from tall closed to open forest to woodland, to dense (closed) shrubland or scrub forest. Minimum crown cover is at least 10%, but it is more typically in the range 50% to 70%.	The Development Footprint does not contain the required vegetation composition or structure to conform to the Coastal Swamp Sclerophyll Forest TEC	No
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	The canopy layer is dominated by *Casuarina glauca*. The local expression of the ecological community is influenced by soils, history of inundation by tidal flows/estuarine system	The Development Footprint does not contain the required vegetation composition or structure to conform to the Coastal Swamp Oak TEC	No

		dynamics, groundwater salinity, site history, disturbance regimes and current land management		
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	The Littoral Rainforest and Coastal Vine Thickets of Eastern Australia typically has tall trees as part of the canopy, but not always. The height of the canopy plants vary depending on the degree of exposure and can range from one to 25 metres. The minimum patch size needs to be 0.1 hectares. At least 30 per cent of the canopy cover in the patch must be from one or more of the rainforest canopy species	The Development Footprint does not contain the required vegetation composition or structure to conform to the Littoral Rainforest and Coastal Vine Thickets TEC	No

A-1-3 Potential Occurrence Assessment (Species)

The following tables are used as a summary to address threatened species in terms of potential occurrence and requirement for formal assessment. A threatened species has been assessed if it is known or likely to occur within the locality and may occur to some degree on-site due to potential habitat.

Likelihood of occurrence is based on the probability of occurrence in terms of:

- Habitat extent (e.g. sufficient to support an individual or the local population; comprises all of home range; forms part of larger territory, etc.); quality (i.e. condition, including an assessment of threats, historical land uses on and off-site, and future pressures); interconnectivity to other habitat; and ability to provide all the species life-cycle requirements (either the site alone, or other habitat within its range);
- Occurrence frequency (i.e. on-site resident; portion of larger territory or seasonal migrant); and
- Usage i.e. breeding or non-breeding; opportunistic foraging (e.g. seasonal, migratory or opportunistic); marginal fringe of core range; refuge; roosts; etc.

Table 19: Potential occurrence assessment – flora

Species Name	Common Name	EPBC Act Listing	Likelihood of Occurrence	Significance Assessment Required?
Acronychia littoralis	Scented Acronychia	Endangered	The subject site occurs in the southern extent of this species' range. It is known to occur between littoral rainforest and swamp sclerophyll forests, usually within 2 km of the coast. Unlikely to occur.	No
Allocasuarina defungens	Dwarf Heath Casuarina	Endangered	In NSW this species is mostly found growing in tall heath on sand. No suitable habitat on site and not within the known geographic range for this species. Unlucky to occur.	No
Allocasuarina thalassoscopica	-	Endangered	This species is restricted to the low closed heathland community of Mt Coolum on the Sunshine Coast and is not known to occur outside of this area. Unlikely to occur.	No
Arthraxon hispidus	Hairy-joint Grass	Vulnerable	A rainforest species favouring habitat with richer loams soils. Unlikely to occur.	No
Asperula asthenes	Trailing Woodruff	Vulnerable	This species is known to occur in damp areas, often along riverbanks. Unlikely to occur.	No
Cryptostylis hunteriana	Leafless Tongue-orchid	Vulnerable	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland. Unlikely to occur.	No
Cynanchum elegans	White-flowered Wax Plant	Endangered	This species predominately occurs in dry rainforest and littoral rainforest communities. Unlikely to occur.	No

Euphrasia arguta	-	Critically Endangered	Occurs in the open forest country around Bathurst in sub humid places, on grassy country and in meadows near rivers. Euphrasia arguta has an annual habit and has been observed to die off over the winter months, with active growth and flowering occurring between January and April. Unlikely to occur.	No
Leichhardtia longiloba	Clear Milkvine	Vulnerable	Subtropical and warm temperate rainforest, lowland moist or open eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops. Unlikely to occur.	No
Macadamia integrifolia	Macadamia Nut	Vulnerable	This species is generally found in Queensland with the subject site occurring in the southern extent of this species' known distribution. Unlikely to occur.	No
Melaleuca biconvexa	Biconvex Paperbark	Vulnerable	This species occurs in swamp margins or creek edges. Habitat of this type does occur within the subject site. Unlikely to occur.	No
Persicaria elatior	Knotweed	Vulnerable	This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance. Unlikely to occur.	No
Phaius australis	Lesser Swamp-orchid	Endangered	This species is limited to areas of swampy grassland and swampy forest. The subject site does contain some suitable habitat for this species. Unlikely to occur.	No
Rhodamnia rubescens	Scrub Turpentine	Critically Endangered	A rainforest species which is also occasionally found in wet sclerophyll forest. Limited habitats of this type occur within the subject site. Unlikely to occur.	No
Rhodomyrtus psidioides	Native Guava	Critically Endangered	This species is often found near creeks and drainage lines within rainforest communities. The subject site does not contain rainforest habitats. Unlikely to occur.	Yes
Syzygium paniculatum	Magenta Lilly Pilly	Vulnerable	This species is restricted to specific soils of riverside rainforests and remnant littoral rainforests (DPIE 2021b). The subject site does not contain rainforest habitats. Not detected during surveys. Unlikely to occur.	No
Thesium australe	Austral Toadflax	Vulnerable	Austral Toadflax occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (Themeda australis). Unlikely to occur.	No
Vincetoxicum woollsii	Cryptic Forest Twiner	Endangered	This species grows in moist eucalypt forest, moist sites in dry eucalypt forest and rainforest margins. Unlikely to occur.	No

Table 20: Potential occurrence assessment – fauna

Species Name	Common Name	EPBC Act Listing	Likelihood of Occurrence	Significance Assessment Required?
Amphibia				
Litoria aurea	Green and Golden Bell Frog	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Mixophyes balbus	Stuttering Frog	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Mixophyes iteratus	Giant Barred Frog	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Aves				
Anthochaera phrygia	Regent Honeyeater	Critically Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Ardenna grisea	Sooty Shearwater	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Arenaria interpres	Ruddy Turnstone	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Botaurus poiciloptilus	Australasian Bittern	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Calidris acuminata	Sharp-tailed Sandpiper	Vulnerable Marine/Migratory	The Subject Land does not fall within the known distribution of this species. Unlikely to occur.	No
Calidris canutus	Red Knot, Knot	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Calidris ferruginea	Curlew Sandpiper	Critically Endangered Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Charadrius mongolus	Lesser Sand Plover, Mongolian Plover	Endangered Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	Critically Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Diomedea antipodensis	Antipodean Albatross	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No

Diomedea antipodensis gibsoni	Gibson's Albatross	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Diomedea epomophora	Southern Royal Albatross	Vulnerable Marine/Migratory	The Subject Land does not fall within the known distribution of this species. Unlikely to occur.	No
Diomedea exulans	Wandering Albatross	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Erythrotriorchis radiatus	Red Goshawk	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Falco hypoleucos	Grey Falcon	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Fregetta grallaria grallaria	White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian)	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Grantiella picta	Painted Honeyeater	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Hirundapus caudacutus	White-throated Needletail	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Lathamus discolor	Swift Parrot	Critically Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Limosa lapponica baueri	Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Macronectes giganteus	Southern Giant-Petrel, Southern Giant Petrel	Endangered Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Macronectes halli	Northern Giant Petrel	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Melanodryas cucullata cucullata	South-eastern Hooded Robin, Hooded Robin (south-eastern)	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Neophema chrysostoma	Blue-winged Parrot	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	Critically Endangered Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Pachyptila turtur subantarctica	Fairy Prion (southern)	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No

Phoebetria fusca	Sooty Albatross	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Pluvialis squatarola	Grey Plover	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Pterodroma leucoptera leucoptera	Gould's Petrel, Australian Gould's Petrel	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Pterodroma neglecta neglecta	Kermadec Petrel (western)	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Rostratula australis	Australian Painted Snipe	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Stagonopleura guttata	Diamond Firetail	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Sternula nereis nereis	Australian Fairy Tern	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Thalassarche bulleri	Buller's Albatross, Pacific Albatross	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Thalassarche bulleri platei	Northern Buller's Albatross, Pacific Albatross	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Thalassarche carteri	Indian Yellow-nosed Albatross	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Thalassarche cauta	Shy Albatross	Endangered Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Thalassarche melanophris	Black-browed Albatross	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Thalassarche salvini	Salvin's Albatross	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Thalassarche steadi	White-capped Albatross	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Tringa nebularia	Common Greenshank, Greenshank	Endangered Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Xenus cinereus	Terek Sandpiper	Vulnerable Marine/Migratory	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Mammals				

Balaenoptera musculus	Blue Whale	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Dasyurus maculatus maculatus (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Eubalaena australis	Southern Right Whale	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Notamacropus parma	Parma Wallaby	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Petauroides volans	Greater Glider (southern and central)	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Petaurus australis australis	Yellow-bellied Glider (south-eastern)	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	Endangered	The Subject Land contains a small number of preferred habitat for the species. Unlikely to occur.	No
Potorous tridactylus tridactylus	Long-nosed Potoroo (northern)	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Pseudomys novaehollandiae	New Holland Mouse, Pookila	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Reptiles				
Caretta caretta	Loggerhead Turtle	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Chelonia mydas	Green Turtle	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Dermochelys coriacea	Leatherback Turtle, Leathery Turtle, Luth	Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No

Eretmochelys imbricata	Hawksbill Turtle	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Natator depressus	Flatback Turtle	Vulnerable	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No
Insects				
Argynnis hyperbius inconstans	Australian Fritillary	Critically Endangered	The Subject Land does not contain preferred habitat for the species. Unlikely to occur.	No

A-1-4 Conclusion

From the due diligence assessment of MNES above, it has been determined that a referral of the proposed action to DAWE is not required.

A-2 Site Vegetation List

Table 21: Flora species recorded on the Subject Land

Common Name	Scientific Name	BC Act Status	EPBC Act Status
Canopy Trees			
Camphor Laurel*	*Cinnamomum camphora*		
Pink Bloodwood	*Corymbia intermedia*		
Blackbutt	*Eucalyptus pilularis*		
Forest Red Gum	*Eucalyptus tereticornis*		
Cheese Tree	*Glochidion ferdinandi*		
Kanooka	*Tristaniopsis laurina*		
Shrubs			
Coffee Bush	*Breynia oblongifolia*		
Native Guava	*Rhodomyrtus psidoides*	*CE*	*CE*
Grasses			
Red Grass	*Bothriochloa macra*		
Barbed Wire Grass	*Cymbopogon refractus*		
-	*Dichanthium spp.*		
Blady Grass	*Imperata cylindrica*		
Australian Basket Grass	*Oplismenus aemulus*		
Water Couch	*Paspalum distichum*		
*Broadleaf Paspalum	*Paspalum mandiocanum*		
-	*Phyllostachys spp.*		
Groundcovers			
Indian Pennywort	*Centella asiatica*		
Spear Thistle*	*Cirsium vulgare*		
Wombat Berry	*Eustrephus latifolius*		
Common Fringe-sedge	*Fimbristylis dichotoma*		
-	*Glycine spp.*		
Small St. John's Wort	*Hypericum gramineum*		
Catsear	*Hypochaeris radicata*		
Lantana	*Lantana camara*		
Whiteroot	*Lobelia purpurascens*		
Wattle Mat-rush	*Lomandra filiformis subsp. filiformis*		
-	*Oxalis spp.*		
*Paddy's Lucerne	*Sida rhombifolia*		
* Veined Verbena	*Verbena rigida var. rigida*		
Ivy-leaved Violet	*Viola hederacea*		
Fuzzweed	*Vittadinia cuneata var. cuneata*		

Common Name	Scientific Name	BC Act Status	EPBC Act Status
Vines			
Climbing Guinea Flower	*Hibbertia scandens*		
Key: Exotic species (*)			

A-3 Site Fauna List

Table 22: Fauna species recorded during surveys.

Common Name	Scientific Name	Detection Method	BC Act Status	EPBC Act Status
Aves				
Australian Raven	*Corvus coronoides*	HC, Vis		
Pied Butcherbird	*Cracticus nigrogularis*	HC, Vis		
Australian Magpie	*Gymnorhina tibicen*	HC, Vis, Cam		
Crested Pigeon	*Ocyphaps lophotes*	Vis		
Sulphur-crested Cockatoo	*Cacatua galerita*	HC, Vis		
Indian Myna*	*Acridotheres tristis*	HC, Vis		
Feral Pigeon*	*Columba livia domestica*	Vis		
Nosey Miner	*Manorina melanocephala*	Cam		
Galah	*Eolophus roseicapilla*	Cam		
Mammalia				
Red Fox*	*Vulpes vulpes*	Cam		
Sugar Glider	*Petaurus breviceps*	Cam		
Brush tailed Possum	*Trichosurus vulpecula*	Cam		
Key: Introduced species (*), PIR Camera (Cam), Heard Calling (HC), Scats identified (Scat), Visual Observation (Vis).				

A-4 Biodiversity Credit Report

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

Zone	Vegetation zone name	Vegetation integrity loss	Area	Sensitivity to loss	Sensitivity to loss(Justification)	Species sensitivity to gain class	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest									
1	3166_Heavily_Modified	11.5	0.13 hectares	Low Sensitivity to Loss	PCT Cleared - 8%	High Sensitivity to Gain	1.5		0
3	3166_Derived_Grassland	9	0.32 hectares	Low Sensitivity to Loss	PCT Cleared - 8%	High Sensitivity to Gain	1.5		0
								Subtotal: **0**	
Northern Sands Bloodwood-Swamp Turpentine Forest									
2	3553_Heavily_Modifed	23	0.12 hectares	Very High Sensitivity to Loss	PCT Cleared - 94%	High Sensitivity to Gain	2.5		2
4	3553_Derived_Grassland	3.7	0.26 hectares	Very High Sensitivity to Loss	PCT Cleared - 94%	High Sensitivity to Gain	2.5		0
								Subtotal: **2**	

Total: 2

Ecosystem credit classes

Ecosystem credit summary

PCT	TEC	Area	HBT Cr	No HBT Cr	Credits
3166-Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest	Not a TEC	0.45	0	0	0
3553-Northern Sands Bloodwood-Swamp Turpentine Forest	Not a TEC	0.38	0	2	2

Credit classes for 3166

Like-for-like options

Class	Trading group	HBT	Credits	IBRA region
North Coast Wet Sclerophyll Forests This includes PCT's: 487, 613, 1563, 1575, 3058, 3060, 3067, 3073, 3078, 3084, 3087, 3088, 3102, 3125, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3145, 3147, 3148, 3149, 3150, 3153, 3154, 3156, 3157, 3158, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3168, 3169, 3171, 3172, 3173, 3174, 3176, 3177, 3178, 3180, 4043, 4115	North Coast Wet Sclerophyll Forests - < 50% cleared group (including Tier 4 or higher threat status).	No	0	Macleay Hastings , Carrai Plateau, Coffs Coast and Escarpment, Comboyne Plateau, Karuah Manning, Macleay Gorges, Mummel Escarpment and Upper Manning. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
North Coast Wet Sclerophyll Forests This includes PCT's: 487, 613, 1563, 1575, 3058, 3060, 3067, 3073, 3078, 3084, 3087, 3088, 3102, 3125, 3136, 3137, 3138, 3139, 3140, 3141, 3142, 3145, 3147, 3148, 3149, 3150, 3153, 3154, 3156, 3157, 3158, 3160, 3161, 3162, 3163, 3164, 3165, 3166, 3168, 3169, 3171, 3172, 3173, 3174, 3176, 3177, 3178, 3180, 4043, 4115	North Coast Wet Sclerophyll Forests - < 50% cleared group (including Tier 4 or higher threat status).	No	0	Macleay Hastings , Carrai Plateau, Coffs Coast and Escarpment, Comboyne Plateau, Karuah Manning, Macleay Gorges, Mummel Escarpment and Upper Manning. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Credit classes for 3553

Like-for-like options

Class	Trading group	HBT	Credits	IBRA region
Coastal Dune Dry Sclerophyll Forests This includes PCT's: 3553, 3556	Coastal Dune Dry Sclerophyll Forests - ≥ 90% cleared group (including Tier 1 or higher threat status).	No	2	Macleay Hastings , Carrai Plateau, Coffs Coast and Escarpment, Comboyne Plateau, Karuah Manning, Macleay Gorges, Mummel Escarpment and Upper Manning. 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: 3553, 3556	Coastal Dune Dry Sclerophyll Forests - ≥ 90% cleared group (including Tier 1 or higher threat status).	No	0	Macleay Hastings , Carrai Plateau, Coffs Coast and Escarpment, Comboyne Plateau, Karuah Manning, Macleay Gorges, Mummel Escarpment and Upper Manning. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

A-5 BAM Minimum Information Requirements Checklist

Table 23: Minimum information required for the BDAR Stage 1

Report Section	BAM Ref	Information	Report Section
Introduction	Chapters 2 and 3	**INFORMATION** Introduction to the biodiversity assessment including: ☐ brief description of the proposal ☐ identification of subject land1 boundary, including: ☐ operational footprint (if BDAR) ☐ construction footprint indicating clearing associated with temporary/ancillary construction facilities and infrastructure (if BDAR) ☐ land proposed for biodiversity certification (if BCAR) ☐ general description of the subject land ☐ sources of information used in the assessment, including reports and spatial data	☐ Section 1.1 ☐ Section 1.2, Figures 1, 2, 3, ☐ Section 1.4 ☐ Section 1.5
		MAPS and TABLES (in document) ☐ 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 (if BDAR)	☐ Figures 1, 2, 3
		DATA (to be supplied) N/A	
Landscape Context	Sections 3.1 and 3.2, Appendix E	**INFORMATION** Identification of site context components and landscape features, including: ☐ general description of subject land topographic and hydrological setting, geology and soils ☐ percent native vegetation cover in the assessment area (as described in BAM Section 3.2) ☐ IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.)) ☐ rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E) ☐ wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.)) ☐ connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.)) ☐ 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.) ☐ areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.)) ☐ any additional landscape features identified in any SEARs for the proposal ☐ NSW (Mitchell) landscape on which the subject land occurs	☐ Section 2 ☐ Section 2.1.2, Figure 5 ☐ Section 2.1.1 ☐ Section 2.1.4 ☐ Section 2.1.4 ☐ Section 2.1.4, Figure 6 ☐ Section 2.1.4 ☐ Section 2.1.5, Figure 4 ☐ Section 2.1.4 ☐ Section 2.1.1
		MAPS and TABLES (in document) ☐ Site Map ☐ Boundary of subject land ☐ Cadastre of subject land ☐ Landscape features identified in BAM Subsection 3.1.3 ☐ Location Map	**For following maps and images:** ☐ Figures 1, 2, 4, 5, 6

Report Section	BAM Ref	Information	Report Section
		☐ Digital aerial photography at 1:1,000 scale or finer ☐ Boundary of subject land ☐ Assessment area, (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development ☐ Landscape features identified in BAM Subsection 3.1.3 ☐ 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 map include: ☐ IBRA bioregions and subregions ☐ rivers, streams and estuaries ☐ wetlands and important wetlands ☐ connectivity of different areas of habitat ☐ karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features ☐ areas of outstanding biodiversity value occurring on the subject land and assessment area ☐ any additional landscape features identified in any SEARs for the proposal ☐ NSW (Mitchell) landscape on which the subject land occurs	
		DATA (to be supplied) ☐ All report maps as separate jpeg files Individual digital shape files of: ☐ subject land boundary ☐ assessment area (i.e. subject land and 1500 m buffer area) boundary ☐ cadastral boundary of subject land ☐ areas of native vegetation cover ☐ landscape features	
Native Vegetation	Chapter 4, Appendix A and Appendix H	**INFORMATION** ☐ 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) ☐ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2) ☐ 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) ☐ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2 ☐ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A) For each PCT within the subject land, describe: ☐ vegetation class ☐ extent (ha) within subject land ☐ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.)) ☐ plant species relied upon for identification of the PCT and relative abundance of each species	☐ Section 3.2 ☐ Section 3.2 ☐ Section 3.2, Figure 7 ☐ Section 3.1 ☐ Section 3.1 ☐ Section 3.2.1, Table 3 ☐ Section 3.2.1, Table 3 ☐ Section 3.2.2 ☐ Section 3.2.2 ☐ Section 3.2.1, Section 3.3 ☐ Section 3.2.1, Table 3 ☐ Section 3.4

Report Section	BAM Ref	Information	Report Section
		☐ if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.))	☐ Section 3.4, Figure 9
		☐ estimate of percent cleared value of PCT (BAM Subsection 4.2.1(5.))	☐ Section 3.4, Table 4
		Describe the vegetation integrity assessment of the subject land, including:	☐ Section 3.1.1, 3.1.2
		☐ identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1)	☐ Section 3.1.2
		☐ assessment of patch size (as described in BAM Subsection 4.3.2)	
		☐ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	☐ Section 3.2
		☐ use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.))	n/a
		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):	n/a
		☐ identify the PCT or vegetation class for which local benchmark data will be applied	n/a
		☐ identify published sources of local benchmark data (if benchmarks obtained from published sources)	n/a
		☐ describe methods of local benchmark data collection (if reference plots used to determine local benchmark data)	
		☐ provide justification for use of local data rather than BioNet Vegetation Classification benchmark values	
		☐ provide written confirmation from the decision-maker that they support the use of local benchmark data	
		MAPS and TABLES (in document)	
		☐ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of 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 5
		☐ Map of PCTs within the subject land (as described in BAM Section 4.2(1.))	☐ Figure 7
		☐ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1)	**Maps/Figures for following:**
		☐ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCTs boundaries	☐ Figure 9
		☐ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha)	
		☐ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2)	**Table for following:**
		Table of current vegetation integrity scores for each vegetation zone within the site and including:	☐ Table 4
		☐ composition condition score	☐ Table 9
		☐ structure condition score	
		☐ function condition score	
		☐ presence of hollow bearing trees	
		DATA (to be supplied)	
		☐ All report maps as separate jpeg files	
		☐ Plot field data (MS Excel format)	
		☐ Plot field data sheets	
		Digital shape files of:	
		☐ PCT boundaries within subject land	

Report Section	BAM Ref	Information	Report Section
		☐ TEC boundaries within subject land	
		☐ vegetation zone boundaries within subject land	
		☐ floristic vegetation survey and vegetation integrity plot locations	
Threatened Species	Chapter 5	**INFORMATION**	
		Identify ecosystem credit species likely to occur on the subject land, including:	
		☐ list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.))	☐ Section 4.1.1, Table 5 ☐ Section 4.1.1, Table 6
		☐ 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)	☐ Section 4.1.1
		☐ justification for addition of any ecosystem credit species to the list	
		Identify species credit species likely to occur on the subject land, including:	☐ Section 4.2.1, Table 7
		☐ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	☐ Table 8
		☐ 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 8
		☐ 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)	☐ Section 4.2.1
		☐ justification for addition of any species credit species to the list	
		From the list of candidate species credit species, identify:	
		☐ species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2.a.))	☐ Section 4.3
		☐ 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.))	☐ Section 4.3
		☐ species for which targeted surveys are to be completed to determine species presence (Subsection 5.2.4(2.b.))	☐ Section 4.3.1
		☐ species for which an expert report is to be used to determine species presence (Subsection 5.2.4(2.c.))	
		Present the outcomes of species credit species assessments from:	☐ Section 4.3.1
		☐ threatened species survey (as described in BAM Section 5.2.4)	☐ Section 4.3.1
		☐ expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Section 5.2.4 and 5.3, Box 3)	☐ Table 7, Section 4.3.1
		Where survey has been undertaken include detailed information on:	☐ Section 4.3.1
		☐ survey method and effort, (as described in BAM Section 5.3)	☐ Section 4.3.1
		☐ 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	n/a
		☐ 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	n/a n/a **N/a for following**
		☐ survey personnel and relevant experience	
		☐ describe any limitations to surveys and how these were addressed/overcome	
		Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include:	
		☐ justification of the use of an expert report	

Report Section	BAM Ref	Information	Report Section
		☐ identify the expert, provide evidence of their expert credentials and Departmental approval of expert status	
		☐ all requirements of Box 3 have been addressed in the expert report	N/a
		Where use of local data is proposed (BAM Subsection 1.4.2):	
		☐ identify relevant species	
		☐ identify data to be amended	☐ Figure 10
		☐ identify source of information for local data, e.g. published literature, additional survey data, etc.	
		☐ justify use of local data in preference to VIS Classification or TBDC data	N/a
		☐ provide written confirmation from the decision-maker that they support the use of local data	N/a
		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:	N/a
		☐ the unit of measure for each species is documented	N/a
		for species assessed by area:	
		☐ the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5)	N/a
		☐ a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to map the species polygon including reference to information in the TBDC for that species and any buffers applied	
		for species assessed by counts of individuals:	
		☐ the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.))	
		☐ the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken	
		☐ 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	
		☐ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4)	
		MAPS and TABLES (in document)	
		☐ Table showing ecosystem credit species in accordance with BAM Section 5.1.1, and identifying:	☐ Table 5 ☐ Table 6
		☐ the ecosystem credit species removed from the list	
		☐ the sensitivity to gain class of each species	☐ Table 7
		☐ Table detailing species credit species in accordance with BAM section 5.2 and identifying:	☐ table 8
		☐ the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or micro habitat features are not present	☐ Section 4.4.1
		☐ the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map	n/a
		☐ 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)	n/a

Report Section	BAM Ref	Information	Report Section
		☐ 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)	
		DATA (to be supplied) ☐ Digital shape files of suitable habitat identified for survey for each candidate species credit species ☐ Survey locations including GPS coordinates of any plots, transects, grids ☐ Digital shape files of each species polygon including GPS coordinates of located individuals ☐ Species polygon map in jpeg format ☐ Expert reports and any supporting data used to support conclusions of the expert report ☐ Field data sheets detailing survey information including prevailing conditions, date, time, equipment used, etc.	**To be provided on lodgement in BOAMS**
Prescribed Impacts	Chapter 6	**INFORMATION** Identify potential prescribed biodiversity impacts on threatened entities, including: ☐ karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) ☐ occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) ☐ corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) ☐ water bodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4) ☐ protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5) ☐ 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) ☐ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts ☐ 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) Where the proposed development is for a wind farm: ☐ identify a candidate list of protected animals that may use the development site as a flyway or migration route, including: resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the proposal area (as described in BAM Subsection 6.1.5) ☐ provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.) ☐ predict the habitual flight paths for nomadic and migratory species likely to fly over the subject land and map the likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.))	**For the following:** ☐ Section 4.4.2, Table 9 n/a n/a n/a
		MAPS and TABLES (in document) ☐ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.)	n/a n/a

Report Section	BAM Ref	Information	Report Section
		☐ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only)	
		DATA (to be supplied) ☐ Digital shape files of prescribed impact feature locations ☐ Prescribed impact features map in jpeg format	n/a

Table 24:Minimum information required for the BDAR Stage 2

Report Section	BAM Ref	Information	Maps and Tables (in document)	Data (to be supplied)	Report Section
Avoid and minimise impacts	Chapter 7	**INFORMATION** Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the proposal location in accordance with Chapter 7, including an analysis of alternative: ☐ modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology ☐ routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route ☐ alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location ☐ 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 ☐ 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) ☐ Identification of any other site constraints that the proponent has considered in determining the location and design of the proposal (as described in BAM Section 7.2.1(3.))			☐ Section 5 **For the following:** ☐ Section 5.2, Section 5.3, 5.4 and 5.5
		MAPS and TABLES (in document) ☐ Table of measures to be implemented to avoid and minimise the impacts of the proposal, including action, outcome, timing and responsibility ☐ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final proposal footprint, including construction and operation ☐ Maps demonstrating indirect impact zones where applicable			☐ Table 10 n/a n/a
		DATA (to be supplied) Digital shape files of: ☐ alternative and final proposal footprint ☐ direct and indirect impact zones ☐ Maps in jpeg format			On submission with BOAMS
Assessment of Impacts	Chapter 8, Sections 8.1 and 8.2	**INFORMATION** ☐ 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) Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2):			**For the following:** ☐ Section 5.2, 5.3, 5.4, and 6

Report Section	BAM Ref	Information	Maps and Tables (in document)	Data (to be supplied)	Report Section
		☐ description of the nature, extent, frequency, duration and timing of indirect impacts of the proposal ☐ documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications ☐ reporting any limitations or assumptions, etc. made during the assessment ☐ identification of the threatened entities and their habitat likely to be affected Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including: assessment of the nature, extent and duration of impacts on the habitat of threatened species or ecological communities associated with: ☐ karst, caves, crevices, cliffs, rocks and other features of geological significance ☐ human-made structures ☐ non-native vegetation ☐ connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range ☐ movement of threatened species that maintains their life cycle ☐ water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities ☐ assessment of the impacts of wind turbine strikes on protected animals ☐ assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC			
		MAPS and TABLES (in document) ☐ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts			☐ Table 11
		DATA (to be supplied) N/A			
Mitigation and Management of Impacts	Chapter 8, Sections 8.4 and 8.5	**INFORMATION** Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including: ☐ techniques, timing, frequency and responsibility ☐ identify measures for which there is risk of failure ☐ evaluate the risk and consequence of any residual impacts ☐ document any adaptive management strategy proposed Identification of measures for mitigating impacts related to: ☐ displacement of resident fauna (as described in BAM Subsection 8.4.1(2.)) ☐ indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) ☐ mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2) ☐ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5)			**For the following:** ☐ Section 5.5
		MAPS and TABLES (in document) ☐ Table of measures to be implemented to mitigate and manage impacts of the proposal, including action, outcome, timing and responsibility DATA (to be supplied) – N/A			☐ Section 5..5.14, Table 10
		DATA (to be supplied)			

Report Section	BAM Ref	Information	Maps and Tables (in document)	Data (to be supplied)	Report Section
		N/A			
Impact Summary	Chapter 9	**INFORMATION** Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including: ☐ addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land ☐ addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land ☐ documenting assumptions made and/or limitations to information ☐ documenting all sources of data, information, references used or consulted ☐ clearly justifying why any criteria could not be addressed ☐ Identification of impacts requiring offset in accordance with BAM Section 9.2 ☐ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.) ☐ Identification of areas not requiring assessment in accordance with BAM Section 9.3			**For the following:** ☐ Section 6.1
		MAPS and TABLES (in document) ☐ Map showing the extent of TECs at risk of an SAII within the subject land ☐ Map showing location of threatened species at risk of an SAII within the subject land Map showing location of: ☐ impacts requiring offset ☐ impacts not requiring offset ☐ areas not requiring assessment			n/a n/a n/a n/a n/a
		DATA (to be supplied) Digital shape files of: ☐ extent of TECs at risk of an SAII within the subject land ☐ location of threatened species at risk of an SAII within the subject land ☐ boundary of impacts requiring offset ☐ boundary of impacts not requiring offset ☐ boundary of areas not requiring assessment ☐ Maps in jpeg format.			 n/a n/a On submission via BOAM
Impact Summary	Chapter 10	**INFORMATION** Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including: ☐ future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H) ☐ change in vegetation integrity score (BAM Subsection 8.1.1) ☐ number of required ecosystem credits for the direct impacts of the proposal on each vegetation zone within the subject land (BAM Subsection 9) ☐ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)			☐ Section 6.2 and 6.3 ☐ Table 11 ☐ Table 11 ☐ Table 11 ☐ Table 12
		MAPS and TABLES (in document) ☐ Table of PCTs requiring offset and the number of ecosystem credits required			☐ Table 11

Report Section	BAM Ref	Information	Maps and Tables (in document)	Data (to be supplied)	Report Section
		☐ Table of threatened species requiring offset and the number of species credits required			☐ Table 12
		DATA (to be supplied) ☐ Submitted proposal in the BAM Calculator			Pending
Biodiversity Credit Report	Chapter 10	**INFORMATION** ☐ 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)			☐ Section 6.2, 6.3
		MAPS and TABLES (in document) ☐ Table of credit class and matching credit profile			n/a
		DATA (to be supplied) ☐ BAM credit report in pdf format			☐ Appendix A-5
Biodiversity certification offsets and strategy (biodiversity certification only)	Chapter 12 and Appendix J	**INFORMATION** Land-based conservation measures including (strategic biodiversity certification only): ☐ identification of parcels subject to land-based conservation measures ☐ identification of land-based conservation measures proposed for each parcel ☐ supporting information to demonstrate suitability of land-based conservation measures (Appendix J) ☐ credit score of land-based conservation measures (Appendix J) Biodiversity certification strategy including: ☐ land proposed for biodiversity certification ☐ land proposed for biodiversity conservation ☐ proposed conservation measures ☐ legal mechanisms for securing delivery of proposed conservation measures ☐ parties to the biodiversity certification and responsibilities, noting where biodiversity certification agreements are proposed ☐ timing for delivery of conservation measures ☐ funding sources for delivery of conservation measures ☐ framework for monitoring, reporting or auditing implementation of conservation measures			**For the following:** n/a
		MAPS and TABLES (in document) ☐ Maps of parcels of land proposed for land-based conservation measures ☐ Maps as per Appendix M as required in relation to any land-based conservation measures ☐ Tables as per Appendix M as required in relation to any land-based conservation measures ☐ Table of credit scores for land-based conservation measures, including scores produced by BAM and weighting adjusted scores as per Appendix J			**For the following:** N/a
		DATA (to be supplied) ☐ Digital shape files of parcels of land proposed for land-based conservation measures ☐ Maps in jpeg format			