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BIODIVERSITY DEVELOPMENT ASSESSMENT REPORT

TOLHURST ESTATE, COFFS HARBOUR

SEPTEMBER 2024

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Version Control

Version	Purpose	Author	Reviewed / approved by	Date
Rev 0.1	Draft Report	Andrew Bates	Lachlan Webster	30/07/2024
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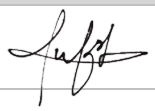
Lachlan Webster	BAAS23020		14/09/2024

Project Number: ENS6262

Our Document Reference: ENS6262-BEC-REP-Keiley Hunter Tolhurst Estate-BDAR rev2.0

Executive Summary

This report has assessed the impact of a residential subdivision on a 0.91 ha property located at 29 Charlesworth Bay Road, Coffs Harbour. It is formally described as 5 DP270532 and a portion of Lot 1 DP 270532. The entirety of Subject Land is zoned R2 – low density residential.

The Subject Land and Development Footprint is zoned R2 – low density residential and the extent of clearing required exceeds the clearing threshold prescribed under the Biodiversity Assessment Method 2020 (BAM) as well as occurring within area mapped as Biodiversity Values. A Biodiversity Development Assessment Report (BDAR) is therefore required to submit with the development application.

One vegetation community was identified in the Development Footprint and these were separated into two distinct and highly degraded vegetation zones. The total area of native vegetation that will require removal for the development is 0.42 ha of which is predominately grassland and two large isolated larger trees. Vegetation integrity of the Subject Land scored below 15. As such, there is no credit obligation for the proposed development.

An area of Biodiversity Values associated with SEPP (Resilience & Hazards) 2021 mapped Littoral Rainforest and occurs in the north east and south east corner of the Subject Land. These two areas were assessed in the field and though they are adjacent littoral rainforest on adjoining land they are devoid of native vegetation above the ground layer, field verification considers this area inaccurately mapped as Littoral Rainforest.

The Development Footprint does not contain any vegetation that conforms to an EEC.

The Development Footprint does not contain any entities considered Serious and Irreversible Impacts.

No threatened flora species were detected within the Development Footprint despite targeted survey by suitably qualified BAM accredited assessors.

Targeted threatened fauna surveys were not undertaken as there was deemed to be no habitat for threatened species on the Subject Land as determined by initial vegetation and habitat surveys.

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.

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 DCCEEW 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 proposed subdivision and development of Lot 5 DP270532 and Lot 1 DP 270532, at 29 Charlesworth Bay Road, Coffs Harbour.

1.1 Requirement for the BDAR

The property is zoned as R2 – Low Density Residential and hence a 400m² 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 0.42ha of total vegetation a BDAR is required.

In addition to exceeding the clearing threshold, the Subject Land also contains a small area of mapped Biodiversity Values in the north eastern corner.

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. Lot 4 DP 270532 is included in the assessment area; however, it is not part of the subject land for the proposed Subdivision Figure 5: Site context.
- **Subject Land:** Lot 5 DP270532 (7321 m2) and a portion of Lot 1 DP 270532 (community land), Coffs Harbour which is an area of 0.91ha. Figure 2: Subject Land, Development Footprint and photo locations
- **Development Footprint:** Refers to the area that will be directly impacted by the proposed action which covers approximately 0.42ha of the Subject Land. Figure 2: Subject Land, Development Footprint and photo locations

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 0.91 ha property located at 29 Charlesworth Bay Road, Coffs Harbour. It is formally described as Lot 5 DP270532 and a portion of Lot 1 DP 270532. The entirety of Subject Land is zoned R2 – low density residential. The context of the Subject Land is provided within Figure 1: Location of the Subject Land

The Subject Land consists of mostly ornamental and planted vegetation lining the perimeters of the southern and northern edges of the property. The majority of the Subject Land is open grassland that is regularly maintained. As a number of species recorded during the field survey were associated with the mapped PCT on adjacent land the vegetation has been classified highly degraded versions of PCT 3127. The Subject Land is used entirely as residential land.

The Subject Land is adjacent to multiple beaches with Diggers Head headland to the east, the vegetation surrounding the Subject Land is remnant with mapped littoral rainforest occurring in the area.

Figure 2: Subject Land, Development Footprint and photo locations and the subsequent Photo Plate 1: Images of the Subject Land depict the condition of uses 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: Subject Land	Biodiversity AUSTRALIA	
	Drawn by: AB	Location: Tolhurst Estate, Coffs Harbour		
	Date: July 2024	Client: Keiley Hunter	Job Number: ENS6262	Spatial Reference: MGA Zone 56 GDA 2020 Scale: 1: 25000

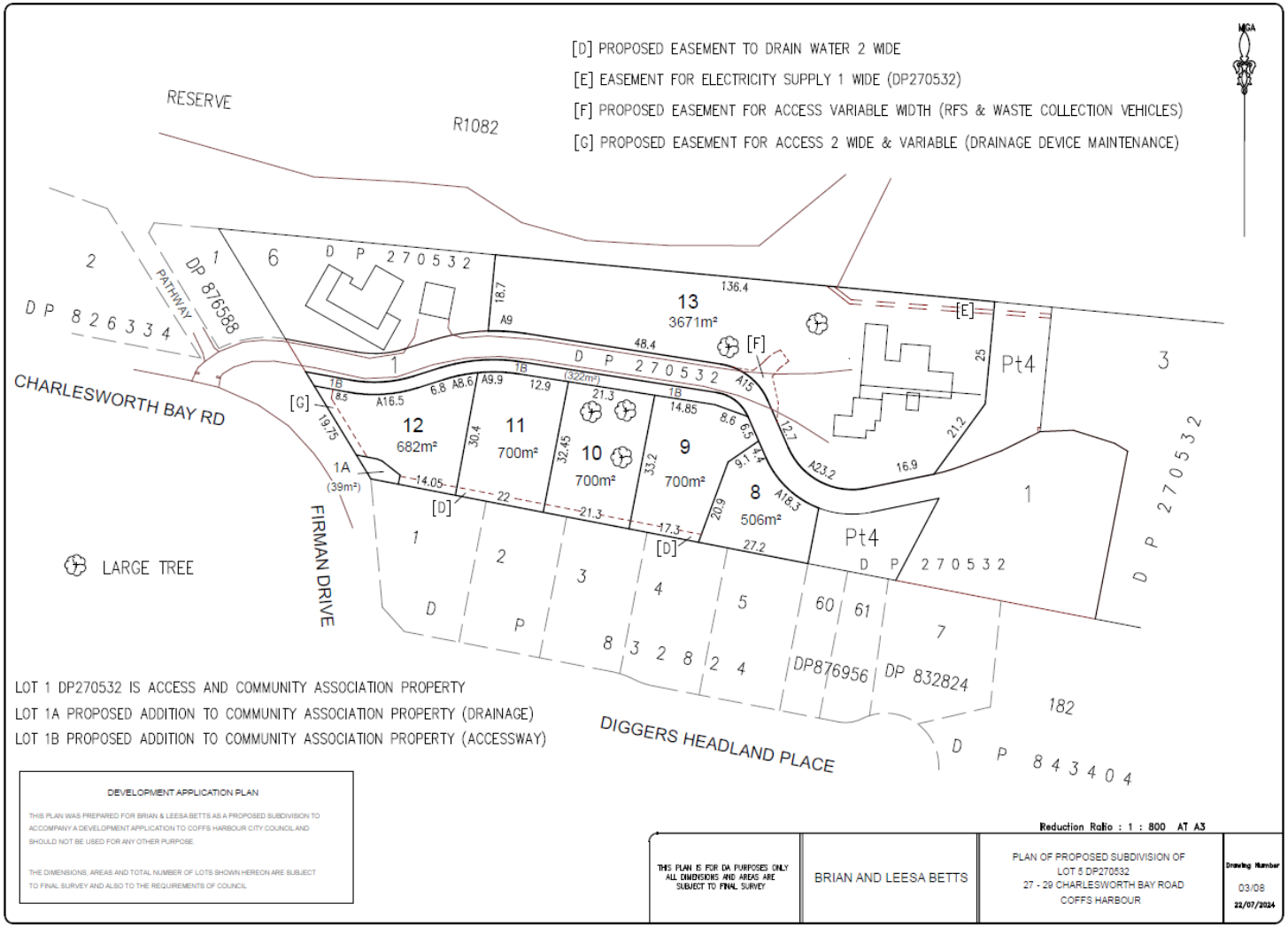
Figure 2: Subject Land, Development Footprint and photo locations

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: LW	Figure Name: Subject Land & Development Footprint	Biodiversity AUSTRALIA	
	Drawn by: LW	Location: Charlesworth BAy Road, Coffs Harbour		
	Date: May 2024	Client: Keiley Hunter	Job Number: ENS6262	Spatial Reference: WGS 84 / Pseudo-Mercator Scale: 1:779

Photo Plate 1: Images of the Subject Land


Photo 7
Photo 8
Photo 9
Photo 10

Figure 3: 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 Climate Change, Energy, the Environment and Water- BioNet/Atlas of Wildlife (DCCEEW 2024a).
- NSW Department of Planning and Environment - Regional Corridors and Key Habitat Mapping (DPE 2024a).
- NSW Department of Planning, Industry and Environment - Biodiversity Values Map and Threshold Tool and digital data layer (DPE 2024c).
- NSW Department of Climate Change, Energy, the Environment and Water- BioNet/Atlas of Wildlife – BioNet Vegetation Classification (DCCEEW 2024b)
- 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).

2. Site Context

2.1.1 IBRA Bioregions and Subregions

The Subject Land is located in the NSW North Coast IBRA region and the Coffs Coast and Escarpment subregion. The Subject Land is located on the Brooms Head-Kempsey Coastal Ramp Mitchell Landscape.

2.1.2 Native Vegetation Extent in 1500m Buffer

A 1500 m buffer was established around the Subject Land (Figure 5: Site context). Analysis with GIS has determined that there is approximately 18.1 % native vegetation cover within 1500 m buffer. Approximately half of the area within this 1500 m buffer occurs over water.

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, a cleared trail exists adjacent to the property to the north. Vegetation is largely intact where land has not been developed on.

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	Jordans Creek and an unnamed small watercourse occur south of the Subject Land.
Important Local Wetlands	No	No	Wetlands occur north west and south of the Subject Land but not within close vicinity for a development of this type.
Connectivity Features	Yes	Yes	The Subject Land falls within mapped regional wildlife corridors as per Figure 6: 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 (Figure 4: Biodiversity Values map). This area corresponds to mapped Littoral Rainforest area under SEPP Resilience and Hazards 2021. Vegetation within these mapped areas however, does not meet the description of littoral rainforest. Vegetation in these mapped areas exists only as ground layer species of which a number were non-native species.

Figure 4: 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: LW	Figure Name: Biodviersity Values	Biodiversity AUSTRALIA
	Drawn by: LW	Location: Charlesworth Bay Road, Coffs Harbour	
	Date: May 2024	Client: Keiley Hunter	Job Number: ENS6262
			Spatial Reference: WGS 84 / Pseudo-Mercator
			Scale: 1:779

Figure 5: 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: Site Context and Native Vegetation	Biodiversity AUSTRALIA	
	Drawn by: AB	Location: Tolhurst Estate, Coffs Harbour		
	Date: July 2024	Client: Keiley Hunter	Job Number: ENS6262	Spatial Reference: WGS 84 / Pseudo-Mercator MGA Zone 56 GDA 2020 Scale: 1:19600

Figure 6: Regional connectivity

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: Tolhurst Estate, Coffs Harbour		
	Date: July 2024	Client: Keiley Hunter	Job Number: ENS6262	Spatial Reference: WGS 84 / Pseudo-Mercator MGA Zone 56 GDA 2020 Scale: 1:19600

3. Native Vegetation

3.1 Survey Methods

Vegetation surveys were undertaken by BAM accredited assessors in June 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 cleared for residential land with ornamental gardens planted with a mixture of native and exotic species, as such the structure of the Vegetation Zones is low across the Subject Land. 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;
- Growth-form cover and abundance of each species;
- Exotic and High Threat Exotic (HTE) plant cover;
- Number of large trees;
- Recruitment;
- Presence of hollow-bearing trees;
- Length of logs; and
- Litter cover.

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 and spatial data provided through the NSW SEED mapping tool (Figure 7). 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.

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: Mapped Plant Community Type	Biodiversity AUSTRALIA	
	Drawn by: AB	Location: Tolhurst Estate, Coffs Harbour		
	Date: July 2024	Client: Keiley Hunter	Job Number: ENS6262	Spatial Reference: WGS 84 / Pseudo-Mercator MGA Zone 56 GDA 2020 Scale: 1:1000

Figure 7: NSW Plant Community Type Mapping (SEED Portal)

3.2 Plant Community Type Descriptions

The entirety of the Subject Land is devoid of remnant vegetation, largely consisting of ornamental native or exotic vegetation. The majority of this vegetation exists as grassland with some larger trees on the perimeter of the Subject Land to the south. One Plant Community Type is mapped central on the Subject Land.

- PCT 3127 Mid North Headland Brush Box Littoral Rainforest of the NSW North Coast Bioregion

The following provides a description of the native vegetation within the Subject Land that will be affected by the proposal. This PCT is listed as Threatened Ecological Communities (TECs) or Endangered Ecological Communities (EECs) under the *EPBC Act* or *BC Act*.

It is unlikely that this PCT is reflected accurately on the Subject Land due to the locations on the Subject Land where it is mapped are either single trees or exotic grassland. Vegetation zones have been more accurately mapped following the field verifications. These are presented within Figure 8: Vegetation zones and survey locations.

A description of the vegetation communities sampled is provided below, with photos following. A map of the vegetation communities, showing the area of clearance (0.42 ha) is provided in Figure 8: Vegetation zones and survey locations.

3.2.1 Community 1

Table 3: Vegetation community 1 description

Vegetation Community (NSW PCT)	No 3127 Mid North Headland Brush Box Littoral Rainforest of the NSW North Coast Bioregion
Vegetation Formation	Rainforests
Vegetation Class	Littoral Rainforests
Land Zones & Area	Grassland - 0.57ha Degraded – 0.12ha
EEC Status	BC Act - Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions EPBC Act - Littoral Rainforest and Coastal Vine Thickets of Eastern Australia
Clearing Extent	95%, however the accuracy of the estimate has not been assessed.
Vegetation Zones	2
Number of Plots	3
Location	Occurs throughout all of the Subject Land.
Description	**Canopy:** Structure and Species: Canopy is overall absent with exception of a few larger trees central to the property and on the southern boundary. Dominate species here *Lophostemon confertus* and *Eucalyptus crebra*. **Shrub layer:** Structure and Species: The mid-stratum is similarly sparse, with some species present including *Synoum glandulosum* and *Wilkiea huegeliana*. **Ground layer:**

	Structure and Species: The ground stratum features a mix of primarily exotic species with some natives present. *Cynodon dactylon* is dominant in the area as well as *Ottochloa gracillima*, a HTE is also present, *Senna pendula*
Condition	This community is predominately in a grassland state featuring little rainforest species that are representative of the assigned PCT, exotics feature heavily in the ground layer with native species being present in the canopy.

Photo Plate 2: Community 1

3.2.2 Justification of PCT and Vegetation Zones

- PCT 3127 - 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,
  - Does not contain large trees over 49cm DBH,
  - Does not contain any fallen logs, &
  - Contains a relatively high percentage of bare ground
  - Species diversity is low, &
  - Weed coverage is very moderate.

Table 4. Justification of PCT 3127 selection

No 3127 Mid North Headland Brush Box Littoral Rainforest of the NSW North Coast Bioregion		
Justification of PCT selection	**Search Term**	**Selection**
	IBRA Bioregion	NSW North Coast
	IBRA Sub-region	Coffs Coast and Escarpment
	Vegetation Formation	Rainforests
	Upper Stratum Species	*Lophostemon confertus and Eucalyptus crebra*
	Mid Stratum Species	Absent
	Selection	Justification of this PCT is largely based upon the species present within the upper canopy and assessment of PCT mapping in the surrounding areas, of which PCT 3127 is present, with *Lophostemon confertus* being a key diagnostic species for this PCT.

3.3 Vegetation Integrity Assessment

3.3.1 Vegetation Zones and Integrity Scores

Table 5 presents the vegetation integrity scores for the two vegetation zones. Figure 8 shows the location of these zones.

Table 5: Vegetation zone and current integrity score

Vegetation Community	Vegetation Zone	Condition Class	No. of plots	Patch Size Category	Area Impacted	Vegetation Integrity (VI) Score			
						Composition	Structure	Function	Total
No 3127 Mid North Headland Brush Box Littoral Rainforest of the NSW North Coast Bioregion	1	Grassland	2	>100 ha	0.58 ha	6.5	25.8	1.9	6.9
No 3127 Mid North Headland Brush Box Littoral Rainforest of the NSW North Coast Bioregion	2	Degraded	1	>100 ha	0.12 ha	2.9	6.2	13.8	6.3

Figure 8: Vegetation zones and survey locations

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	Drawn by: JF	Location: Tolhurst Estate, Coffs Harbour		
	Date: September 2024	Client: Keiley Hunter	Job Number: ENS6262	Spatial Reference: WGS 84 / Pseudo-Mercator MGA Zone 56 GDA 2020 Scale: 1:1000

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 2020a).

The BAM calculator produces a list of ecosystem credit species based on a number of 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 are presented in Table 6: Ecosystem credit species predicted to occur. 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.

These species have been predicted to occur based on the vegetation and habitat types present and are classed with ecosystem credits. Additional species, predicted to occur by the BAM calculator, which have been excluded from this list due to not meeting habitat and/or geographic requirements are listed in Table 7: Ecosystem credit species not predicted to occur on site.

Table 6: Ecosystem credit species predicted to occur

Common Name	Scientific Name	Vegetation Types(s)
Barred Cuckoo-shrike	*Coracina lineata*	3127-Mid North Headland Brush Box Littoral Rainforest
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	3127-Mid North Headland Brush Box Littoral Rainforest
Curlew Sandpiper	*Calidris ferruginea*	3127-Mid North Headland Brush Box Littoral Rainforest
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	3127-Mid North Headland Brush Box Littoral Rainforest
Eastern Osprey	*Pandion cristatus*	3127-Mid North Headland Brush Box Littoral Rainforest
Grey-headed Flying-fox	*Pteropus poliocephalus*	3127-Mid North Headland Brush Box Littoral Rainforest
Large Bent-winged Bat	*Miniopterus orianae oceanensis*	3127-Mid North Headland Brush Box Littoral Rainforest
Little Bent-winged Bat	*Miniopterus australis*	3127-Mid North Headland Brush Box Littoral Rainforest
Little Lorikeet	*Glossopsitta pusilla*	3127-Mid North Headland Brush Box Littoral Rainforest
Scarlet Robin	*Petroica boodang*	3127-Mid North Headland Brush Box Littoral Rainforest

Spotted-tailed Quoll	*Dasyurus maculatus*	3127-Mid North Headland Brush Box Littoral Rainforest
Square-tailed Kite	*Lophoictinia isura*	3127-Mid North Headland Brush Box Littoral Rainforest
Superb Fruit-Dove	*Ptilinopus superbus*	3127-Mid North Headland Brush Box Littoral Rainforest
Varied Sittella	*Daphoenositta chrysoptera*	3127-Mid North Headland Brush Box Littoral Rainforest
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	3127-Mid North Headland Brush Box Littoral Rainforest
White-throated Needletail	*Hirundapus caudacutus*	3127-Mid North Headland Brush Box Littoral Rainforest

Table 7: 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. .

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 Species Derived

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 8: List of candidate species credit species, 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 9: List of candidate species credit species excluded, along with the assessment of habitat and geographic requirements which were not met. Targeted survey is not required for these species.

Table 8: List of candidate species credit species

Common Name	Scientific Name	Survey Timing
Flora		
Scented Acronychia	*Acronychia littoralis*	All year
Scrub Turpentine	*Rhodamnia rubescens*	All year
Native Guava	*Rhodomyrtus psidioides*	All year

Table 9: List of candidate species credit species excluded

Common Name	Scientific Name	Habitat/Geographic constraints
Flora		
Brown Fairy-chain Orchid	*Peristeranthus hillii*	Habitat is too degraded for this epiphytic species; no epiphytes were observed on any of the few trees that were present on the Development Footprint.
Fauna		
Curlew Sandpiper	*Calidris ferruginea*	The Development Footprint does not occur within Important Habitat for this species.
Eastern Cave Bat	*Vespadelus troughtoni*	The Subject Land does not contain the required cave roosting habitat that is essential for the lifecycle of this species. The species is unlikely to occur.
Laced Fritillary	*Argynnis hyperbius*	The Development Footprint does not contain Arrowhead Violet, a key indicator species for the Laced Fritillary making it unlikely to occur within this area.
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.
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.

4.3 Targeted Survey Methods

Targeted surveys were undertaken for the candidate species identified in Table 8: 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 June 2024 by accredited assessor Lachlan Webster (BAAS23020) (CV's within appendix 6). The native guava, scented Acronychia and scrub turpentine were the focus of these surveys however searches incorporated all threatened species.

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 typical 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 ecologist. Given the limited extent of the Development Footprint, this level of targeted threatened flora effort allowed for 100% coverage of the Development Footprint and went above and beyond the guidelines. 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.

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

Fauna surveys were not required for this assessment due to the small size of the Subject Land in conjunction with the highly degraded habitat on the Subject Land, making it overall unsuitable habitat for any of the potential candidate species within the area.

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.

4.3.3 Survey Timing and Limitations

4.3.3.1 Flora

The survey period fell within the BAM-C prescribed survey period for all target flora species.. The recent rainfall are likely to have triggered flowering events for all other target species making them easily detectable if present.

4.3.3.2 Fauna

There were no target fauna species required during assessment of the Subject Land.

4.3.4 Weather Conditions

During the month of June temperatures ranged from 3°C to 26°C (BOM 2024 - nearest weather station at Coffs Harbour Airport).

4.4 Targeted Survey Results

4.4.1 Flora

Threatened flora surveys failed to detect the presence of any threatened flora species within the Subject Land.

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 lawn maintenance and weed invasion.

A range of habitat features were recorded which are described in the following table.

Table 10: Summary of site habitat values

Habitat/ Attribute Type	Vegetation Zone 1	Vegetation Zone 2
	3127 Poor	3127 Degraded
Groundcover	Predominantly grassland with little coverage of other herbs.	Predominantly grassland with little coverage of other herbs.
Leaf litter	Little to no leaf litter throughout zone.	Some leaf litter from overhanging trees, but in small amounts.
Logs and debris	Absent	Absent
Hollows	Absent	Absent
Nectar Sources	Eucalypt and species present on the Subject Land would flower throughout the year.	Limited sources of nectar present – largely comprised of the scattered and *Eucalypt* species present.
Sap and gum sources	Absent	Absent
Primary preferred Koala browse trees	Absent	Absent
Allocasuarinas	Absent	Absent
Aquatic/ wetland habitats	Absent	Absent
Fruiting species	Absent	Absent
Forest bird habitat	Not within Subject Land, some vegetation may provide connectivity to surround habitat.	Not within Subject Land, some vegetation may provide connectivity to surround habitat.

Habitat/ Attribute Type	Vegetation Zone 1	Vegetation Zone 2
	3127 Poor	3127 Degraded
Caves, cliffs, overhangs, culverts, bridges	Absent. Absence of roosts for obligate Microchiropteran bats.	Absent. Absence of roosts for obligate Microchiropteran bats.
Small terrestrial prey	Likely to be low prey abundance over most of the site due to limited vegetation cover and historic disturbances. Arboreal prey species such as possums and gliders would be rare due to the no hollow-bearing trees.	The moderate vegetation cover when the site has not been slashed would provide sufficient habitat for small terrestrial prey species. Unlikely to be arboreal prey species such as possums or gliders due to the lack of connectivity between trees.
Habitat Linkages	Possible habitat linkage due to surrounding remnant vegetation and the Subject Land occurs in an area of relatively high vegetation coverage compared to the surrounding region.	Possible habitat linkage due to surrounding remnant vegetation and the Subject Land occurs in an area of relatively high vegetation coverage compared to the surrounding region.

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.

Table 11: Species credit species survey results

Common Name	Credit Class	Habitat components	Are habitat components met?	Are survey timing constraints met?	Survey Method	Species detected?
Candidate species credit species						
Acronychia littoralis Scented Acronychia	Species	<5km of Coast	Yes	Yes	10m Parallel Transects	No
Rhodamnia rubescens Scrub Turpentine	Species	-	Yes	Yes	10m Parallel Transect	No
Rhodomyrtus psidioides Native Guava	Species	-	Yes	Yes	10m Parallel Transect	No

STAGE 2 - IMPACT ASSESSMENT

5. Avoidance and Minimisation

5.1 Impact Avoidance

The Subject Land in its entirety is mapped as R2 – Low Density Residential as per the Coffs Harbour Local Environmental Plan 2013.

As the Subject Land is largely cleared of large native vegetation the proposal demonstrates an awareness of the surrounding Biodiversity Values, with no overall impact to the vegetation in those areas. Part of the Development Footprint passes through Biodiversity Values, though this is an easement and would impact only the ground layer which is in a highly disturbed state and not reflective of the surrounding Littoral Rainforest.

The key areas which have been identified has containing biodiversity values are;

- The area in the north eastern corner of the Subject Land which contains Biodiversity Values associated with the Coastal Management Act – Littoral Rainforest,
- The area in the south eastern corner of the Subject Land which contains Biodiversity Values associated with the Coastal Management Act – Littoral Rainforest

5.2 Direct Impacts

5.2.1 Vegetation and Habitat Removal

There will be 0.42ha of vegetation removal associated with the proposal. No further vegetation loss will be required through the operational phase of the development. The vegetation to be removed exists as a derived grassland featuring various native and exotic species. Two large trees will be removed one *Corymbia citriodora* and one *Lophostemon confertus* in the central portion of the development footprint. Due to the low vegetation integrity of the Development Footprint there is no requirement to be offset through the purchase and retirement of the appropriate credits.

The vegetation to be affected is unlikely to provide significant habitat to fauna in its current state.

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 will contribute to local 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 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 is of a minute scale and highly degraded and will not likely to contribute to fragmentation, as there are significant areas of habitat in the immediate surrounding area as well as the Subject Land being small and largely devoid of vegetation suitable for breeding/foraging.

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).

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 enter torpor.

The Development Footprint is mostly absent of significant habitat features such as logs, hollow bearing trees and dense ground cover. Injury/mortality during clearing is expected to be not of a high risk for this proposal though care should still be taken. 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 not exposed to any major edge effects due to the small area it encompasses. There are some edge effects in place along the northern perimeter though this is outside the Subject Land itself.

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 study area to some extent. Mitigation measures to limit the potential for spread and minimise impacts from weeds are further discussed in Section 5.5.

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 access roads within the Subject Land are used at low speeds and are overall not anticipated to pose a risk to local fauna as they allow for increased fauna detection and greater likelihood of avoided 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, Dickman 1996, May and Norton 1996, 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 a large increase in human activity in the Subject Land. The Subject Land is however located directly adjacent to an existing residential area and situated amongst a number of broader residential areas. Based on the current human presence in the 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 grassland. 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

Some tree loss will be required for the development. 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.

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 falls within a mapped regional corridor (Figure 6: Regional connectivity). On a more local scale, forested areas of much high vegetation integrity occur on adjacent land which provide connectivity for flora and fauna. The Development Footprint itself does not hold significant connectivity value.

5.4.4 Water Bodies, Water Quality and Hydrological Processes

The Subject Land does not contain any water bodied though is in close proximity to beaches on both the north and eastern directions in the adjoining landscape (Figure 5: Site context). The risks of poor water quality, hydrological process on the adjoining landscape is low due to both the small scale of the construction as well as the topography making it unlikely for construction to impact adjacent waterbodies.

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 access roads within the Subject Land are used at low speeds and are overall not anticipated to pose a risk to local fauna as they allow for increased fauna detection and greater likelihood of avoided 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 Subject Land contains an area of Biodiversity Values in the far north east (Figure 4: Biodiversity Values map) this area correlates with mapped Littoral Rainforest. The area is currently present as isolated patches of poor integrity PCT 3127 and heavily derived exotic grassland (refer to Figure 8: Vegetation zones and survey locations & Photo Plate 1: Images of the Subject Land) which is being utilised

The design of the proposed development has intentionally avoided this area.

5.5.2 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.

5.5.3 Replacement Nest Boxes

There are no hollow bearing trees on the Subject Land.

5.5.4 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.

5.5.5 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.

5.5.6 Hollow-bearing Tree Removal Protocol

Hollow-bearing trees are to be felled in a manner that will minimise the risk of injury/mortality of denning/roosting fauna within the limitation of Work Health and Safety (WHS) Guidelines. This is suggested to be achieved by the following general procedure:

- The hollow-bearing trees are to be gently bumped several times prior to removal to encourage any fauna present to vacate.
- Trees are to be felled in a manner that minimises injury to fauna. This includes gently pushing or 'soft felling' with an excavator or gradual cut down by an arborist
- A qualified ecologist is to be present during felling and sectioning of the hollow-bearing tree (at the proponent's cost) in case of animal injury. Hollows are to be inspected for fauna once the tree is deposited. All uninjured animals are to be released in the retained habitat on site.
- If the hollow is determined to be occupied and fauna do not require assistance (e.g. roosting bats), the entrance is to be blocked and the log placed in a shaded and protected area on the edge of the site. The obstacle is to be removed just prior to dusk to allow passive escape of the fauna within. The log may then be removed if required.

Upon completion of this exercise, a brief written report (with photos) detailing the above is to be submitted to Council within 14 days of the removal of the hollow-bearing trees.

5.5.7 Weed Control

Disturbance of the Subject Land's soils has 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 permanent fencing may be required upon construction of the residential dwellings. 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, 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 Mynahs) 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 12: 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	
Removal of any new weed infestations and ongoing weed control	Bush regenerator/ Ecologist
Restriction of access to site and educational signage	Project coordinator
Strategic placement of artificial lighting	Project coordinator
Restriction of domestic animals	Project coordinator/Owner/Occupants
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 in the guidance document Guide to assist decision-maker to determine a serious and irreversible impact (OEH 2017b).

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

6.2 Ecosystem Credits

Due to the low vegetation integrity of the Subject Land there is no ecosystem credits generated for the proposed development. Table 13: Ecosystem credit requirements, details the credit requirement for the vegetation zones that will be impacted by the development. The full credit report is provided in Appendix 3

6.3 Species Credits

There are no species credits generated for the proposed development.

The full credit report is provided in Appendix 3

Table 13: Ecosystem credit requirements

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss(Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Mid North Headland Brush Box Littoral Rainforest												
1	3127_good	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	52.2	52.2	0.6	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		0
2	3127_Degraded	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	30.7	30.7	0.1	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		0
											Subtotal	**0**
											Total	**0**

7. Conclusion

This report has assessed the impact of a residential subdivision on a 0.91 ha property located at 29 Charlesworth Bay Road, Coffs Harbour. It is formally described as Lot 5 DP270532 and a portion of Lot 1 DP 270532. The entirety of Subject Land is zoned R2 – low density residential.

The Subject Land and Development Footprint is zoned R2 – low density residential and the extent of clearing required exceeds the clearing threshold prescribed under the Biodiversity Assessment Method 2020 (BAM) as well as occurring within area mapped as Biodiversity Values. A Biodiversity Development Assessment Report (BDAR) is therefore required to submit with the development application.

One vegetation community was recorded in the Development Footprint and this was separated into two distinct vegetation zones. The total area of native vegetation that will require removal for the development is 0.42 ha of which is predominately maintained grassland with three larger trees, two casuarinas will be removed as part of the widening of the driveway entry as well.

An area of Biodiversity Values associated with Littoral Rainforest and occurs in the north east corner of the Subject Land. This area has a proposed easement and contains no trees, field verification considers this area inaccurately mapped as Littoral Rainforest.

The Development Footprint does not contain any EECs.

The Development Footprint does not contain any Serious and Irreversible Impacts

No threatened flora 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.

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 DCCEEW for approval under the EPBC Act 1999.

8. References

Battisti, C. (2003). Habitat fragmentation, fauna and ecological network planning: Toward a theoretical conceptual framework. *Italian Journal of Zoology*, Vol. 70:3, pp 241-247.

Biodiversity Conservation Act. Website <https://www.legislation.nsw.gov.au/~/view/act/2016/63>.

Brooker, M.I.H. & Kleinig, D.A. (2006). *Field Guide to Eucalypts*. *Volume 1, South-eastern Australia*, Bloomings Books, Hawthorn, Victoria.

Bureau of Meteorology (2018). Forester Daily Weather Observations. Australian Government. Available at <http://www.bom.gov.au/climate/dwo/201812/html/IDCJDW2046.201812.shtml>.

Chepesiuk, R. (2009). Missing the dark: Health effects of light pollution. *Environmental Health Perspectives*, vol. 117:1.

Clevenger, A.P., Chruszcz, B. and Gunson, K.E. (2002). Spatial patterns and factors influencing small vertebrate fauna road-kill aggregations. *Biological Conservation*, vol. 109, pp. 15-26.

Collinson, W.J., Parker, D.M., Bernard, R.T.F., Reilly, B.K. and Davies-Mostert, H.T. (2014). Wildlife road traffic accidents: a standardized protocol for counting flattened fauna. *Ecology and evolution*, vol. 4(15), pp. 3060-3071.

Cropper, S.C. (1993). Management of Endangered Plants. CSIRO Publications, Victoria.

Department of Agriculture, Water and the Environment (DAWE 2022a). Protected Matters Search Tool. Australian Government. Website <https://www.environment.gov.au/epbc/protected-matters-search-tool>.

DAWE (2022b). Species Profile and Threats Database: SPRAT Profile. Australian Government. Website <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>.

DAWE (2022c). Feral animals in Australia. Australian Government. Website <https://www.environment.gov.au/biodiversity/invasive-species/feral-animals-australia>.

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

Department of Environment and Climate Change (DECC 2007). Threatened Species Assessment Guidelines: The Assessment of Significance. NSW DECC, Hurstville.

Department of Planning and Environment (DPE 2023a). Bionet/Atlas of Wildlife. Website <http://www.bionet.nsw.gov.au/>.

NSW Department of Planning and Environment – NSW Mitchell Landscapes (DPE 2023d).

NSW Department of Planning and Environment – State Vegetation Type Mapping (DPE 2023e).

DPE (2022b). Regional Corridors and Key Habitats. Website <www.environment.nsw.gov.au>.

DPE (2022c). Biodiversity Values Map Viewer. Website <https://www.lmbc.nsw.gov.au/Maps/index.html?viewer=BVMap\>

DPE (2022d). Weeds. Website <https://www.environment.nsw.gov.au/topics/animals-and-plants/pest-animals-and-weeds/weeds>.

Department of Sustainability, Environment, Water, Population and Communities (2011). Survey Guidelines for Australia's Threatened Mammals. Australian Government. Available at <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/assessment-of-significance-guide-070393.pdf>.

Department of the Environment, Water, Heritage and the Arts (2013). Significant Impact Guidelines 1.1 - Matters of National Environmental Significance.

Dickman, C. (1996). Overview of the Impacts of Feral Cats on Australian Native Fauna. Report prepared for the Australian Nature Conservation Agency, Canberra.

Eby, P. (2000). A Case for Listing Grey-Headed Flying Fox (Pteropus poliocephalus) as Threatened in NSW Under IUCN Criterion A2. In: Proceedings of a Workshop to Assess the Status of the Grey-Headed Flying Fox in NSW. Richards, G. (Ed.). Australasian Bat Society, Sydney.

Environment Protection and Biodiversity Conservation Act (1999) Available at <https://www.legislation.gov.au/Series/C2004A00485>.

Gurriga, N., Santos, X., Montori, A., Richter-Boix, A., Franch, M. and Llorente, G.A. (2012). Are protected areas truly protected? The impact of road traffic on vertebrate fauna. *Biodiversity Conservation*, vol. 21, pp. 2761-2774.

Harden, G.J. (Editor) (1990) Flora of NSW. Vols 1-4. NSW Press, Sydney.

Harden, G.J, McDonald, B. and Williams, J.B. (2007).Rainforest Climbing Plants – A field guide to their identification. Gwen Harden Publishing, Nambucca Heads.

Lindenmayer, D. (2002). Gliders of Australia–A Natural History. University of NSW Press, Sydney.

Lindenmayer, D.B. and Fischer, J. (2006). Habitat fragmentation and landscape change. An ecological and conservation synthesis. *CSIRO Publishing*. Melbourne, Australia.

Longcore, T. and Rich, C. (2004). Ecological light pollution. *Frontiers in Ecology and the Environment*. vol. 2;4, pp. 191-198.

May, S.A. and Norton, T.W. (1996). Influence of fragmentation and disturbance on the potential impact of feral predators on native fauna in Australian forest ecosystems. *Australian Wildlife Research*, vol.23, pp. 387-400.

Murcia, C. (1995). Edge effects in fragmented forests: implications for conservation. *Tree*, vol. 10:2.

National Parks and Wildlife Service (NPWS) (2001). Threat Abatement Plan: Predation by the Red Fox (*Vulpes vulpes*). NSW NPWS, Hurstville.

Naturecall Environmental (2015). Statuary Ecological Assessment for Proposed Residential Development on Lot 612 DP 1160096, Blackhead Road, Hallidays Point.

Offerman, H.L., Dale, V.H., Pearson, S.M., Bierregaard, R.O. and O'Neill, R.V. (1995). *Environmental Reviews*, Vol. 3.

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

OEH (2017a). Biodiversity Assessment Method. Office of Environment and Heritage, Sydney.

OEH (2017b). Guide to assist a decision-maker to determine a serious and irreversible impact. Office of Environment and Heritage, Sydney.

OEH (2018). Threatened Species Test of Significance Guidelines.

OEH (2022). Threatened Biodiversity Data Collection. Website <https://www.environment.nsw.gov.au/threatenedSpeciesApp/>.

Preston, B.J. and Adam, P. (2004a). Describing and listing threatened ecological communities under the *Threatened Species Conservation Act 1995* (NSW): Part 1 – the assemblage of species and the particular area. Environmental and Planning Law Journal, 21:250-263

Preston and Adams (2004b). Describing and listing threatened ecological communities under the *Threatened Species Conservation Act 1995* (NSW): Part 2 – the role of supplementary descriptors and the listing process. Environmental and Planning Law Journal, 21:372-390.

Queensland Government (2019). Impacts of erosion. Website <https://www.qld.gov.au/environment/land/management/soil/erosion/impacts>.

Royal Botanical Gardens (2020). Plantnet. Website <www.plantnet.rbgsyd.nsw.gov.au/search>.

Saunders, D.A., Hobbs, R.J. and Margules, C.R. (2012). Biological Consequences of Ecosystem Fragmentation: A Review. *Society for Conservation Biology*, Vol. 5, No 1, pp. 18-32.

Schodde, R. and Tideman, S. (1990). Reader's Digest Complete Book of Australian Birds. Reader's Digest. Sydney

Scotts, D. (2002) editor. Key Habitats and Corridors for Forest Fauna of North-East NSW: A regional landscape to focus conservation, planning, assessment and management. NSW NPWS, Hurstville.

Strahan, D. (Editor) (2000). Complete Book of Australian Mammals. Cornstalk Publishing, Sydney.

Triggs, B. (1996). Scat, track and other traces. New Holland, Sydney.

Troedson, A.L. and Hashimoto, T.R. (2008). Coastal Quaternary Geology – north and south coast of NSW. Geological Survey of New South Wales, Bulletin 34.

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

Appendices

A-1 Resilience and Hazards SEPP

A-1-1 Site Context

The Study Area and a very small portion of the Subject Land contain areas mapped as Littoral Rainforest pursuant to the Resilience and Hazards SEPP 2021 in the north east, see **Error! R eference source not found.** Values Map.

Given that the development footprint falls within land mapped Littoral Rainforest the proposal is subject to Clause 2.7 of the SEPP, as follows;

- The following may be carried out on land identified as "coastal wetlands" or "littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map only with development consent—
    - the clearing of native vegetation within the meaning of Part 5A of the Local Land Services Act 2013,
    - the harm of marine vegetation within the meaning of Division 4 of Part 7 of the Fisheries Management Act 1994,
    - the carrying out of any of the following—
    - earthworks (including the depositing of material on land),
    - constructing a levee,
    - draining the land,
    - environmental protection works,
    - any other development.
- A consent authority must not grant consent for development referred to in subsection (1) unless the consent authority is satisfied that sufficient measures have been, or will be, taken to protect, and where possible enhance, the biophysical, hydrological and ecological integrity of the coastal wetland or littoral rainforest.

The proposal would not be impacting on Littoral Rainforest in reference to the above conditions as the current mapped area does not meet the definition of Littoral Rainforest. The mapped areas of Littoral Rainforest exists as ground layer strata only with no shrub or canopy vegetation. Vegetation was noted as being largely exotic grassland with some native herbs in a highly disturbed state. Furthermore, the development is unlikely to impact the hydrology of adjacent mapped Littoral Rainforest due to the steep topography of the Subject Land that is leading away from adjacent vegetation making it likely that stormwater captured by the site is to be diverted to urban areas to the west rather than feeding into the Littoral Rainforest in the northern and eastern sections of Diggers Headland.

A-2 Coffs Harbour City Council Development Control Plan

This BDAR considers the matter outlined in CHCC DCP as listed in Part E of the Plan.

Preservation of trees and Vegetation

Section E1.1 governs the preservation of trees and vegetation and requires approval from CHCC for the removal of and *Prescribed Vegetation*. *Prescribed vegetation* is defined as:

Prescribed vegetation for the purposes of the *SEPP (Biodiversity and Conservation) 2021* is:

- All *native vegetation* shown on the *Preservation of Vegetation Map* (regardless of size); and
- any native tree with either a height greater than five metres or any part of a trunk that has a diameter greater than 15 centimetres (or a girth greater than 47 cm); and
- any *hollow bearing tree*; and
- any *significant tree*.

One tree, *Lophostemon confertus*, will be removed that is greater than 5 meters tall and has a DBH of more than 15 cm. The removal of this tree can only be undertaken with council approval. Another tree is mapped to the immediate north of this however is considered a non-native in NSW and out of its natural range, *Corymbia citriodora.*

Compensatory Planting

Section E1.2 describes the necessary compensatory planting required where a development impacts on land containing *high conservation value vegetation*. This is described as:

- any primary or secondary koala habitat defined under the Coffs Harbour City Koala Plan of Management 1999;
- any endangered ecological community, or their habitat listed under the Biodiversity Conservation Act 2016;
- over-cleared vegetation types of the Coffs Harbour Local Government Area adopted by the City of Coffs Harbour 28 November 2013;
- high value arboreal habitats of the Coffs Harbour Local Government Area adopted by the City of Coffs Harbour8 May 2014;
- any heathlands, freshwater wetlands, grasslands, saline wetlands, or sedgelands;
- any native old growth or hollow-bearing tree;
- any tree listed on the City of Coffs Harbour Significant Tree Register.

There is no land meeting the definition of high conservation value vegetation on the Development Footprint.

Environmental Design Requirements – General

Section E1.4 describes the environmental design requirements that the proposed development must adhere to on land shown on the *Coffs Harbour LEP 2013 Land Application Map*.

There is an existing access road within the Subject Land and no new roads are proposed for the proposal. The proposed development does not exist within a Kangaroo Management Unit. The Subject Land is not identified as a Priority 1, 2 or 3 Kangaroo Management Zone. The Subject Land is not mapped as a Flying Fox camp as described in the Coffs Harbour LGA Flying Fox Camps Strategic Camp Management Strategy, does not adjoin land managed by the NSW Department of Planning and Environment or within 100 m of any identified Osprey nest.

Although the proposed development doesn't impact on koala habitat it is suggested that at a minimum the following design specifications are met for the subdivision as listed in the CHCC KPoM.

- the proposal will not result in significant barriers to koala movement;
- boundary fencing does not prevent the free movement of koalas;
- lighting and koala exclusion fencing is provided where appropriate on roadways adjacent to koala habitat;
- tree species listed above under Secondary Koala Habitat are retained, where possible;
- new local roads are designed to reduce traffic speed to 40 kph in potential koala blackspots;
- preferred koala trees are used in landscaping where suitable;
- threats to koalas by dogs have been minimised ie. banning of dogs or confining of dogs to koala proof yards;
- fire protection zones, including fuel reduced zones and radiation zones, are provided generally outside of Secondary Koala Habitat.

Application Requirements

Section E1.5 describes the information necessary to accompany a development application to enable proper assessment.

The Development Footprint does not propose the removal of prescribed vegetation.

The Avoid, minimise and offset principle has been demonstrated in this BDAR.

There is no land mapped as *Terrestrial Biodiversity* as per the CHCC DCP on the Subject Land.

A-3 EPBC Act MNES Assessment

A-3-1 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. See Appendix A-6 for the full report.

Table 14: 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	Yes	Outside of Subject Land as it is adjacent to the ocean.
Listed TECs	7	One listed TECs are likely to occur within the assessment area, Littoral Rainforest and Coastal Vine Thickets of Eastern Australia. The presence of this community is assessed in the sections below.
Listed Threatened Species	110	The likelihood of occurrence and the requirement for an assessment of significance for these species is presented in the sections below.
Listed Migratory Species	64	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 (DCCEEW 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-3-2 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 DCCEEW conservation advice for each community to determine whether it conforms to the prescribed definitions.

Table 15: Potential occurrence assessment (communities)

Community Name	Threatened Category	Key Determining Characteristic	Comments	Significance Assessment Required?
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	The Littoral Rainforest and Coastal Vine Thickets of Eastern Australia ecological community is a complex of rainforest and coastal vine thickets on the east coast of Australia influenced by its proximity to the sea. The canopy, which protects less tolerant species and propagules in the understorey from salt laden winds, can range from patchy to closed and may include emergents as well as dead trees due to ongoing natural disturbance. The vegetation height depends on the degree of exposure and can range from dwarf to medium (<1-25 m; Specht 1970) and tends to merge in a height continuum due to coastal processes	No PCTs within the Development Footprint conform to the floristic characteristics of the TEC.	No
Lowland Rainforest of Subtropical Australia	Critically Endangered	Lowland Rainforest mostly occurs in areas <300 m above sea level. Aspect can result in the community being found at >300 m altitude on north-facing slopes, but typically 300 m defines the extent of the lowlands. In addition, Lowland Rainforest typically occurs in areas with high annual rainfall (>1300 mm). 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.	No PCTs within the Development Footprint conform to the floristic characteristics of the TEC.	No
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	The ecological community generally occurs on alluvial soils, with more limited occurrences on in-situ soils within localised depressions, that may be at least occasionally saturated, water-logged, or inundated. The tree canopy is dominated by eucalypts and/or other myrtaceous trees	No PCTs within the Development Footprint conform to the floristic characteristics of the TEC.	No

		(specifically from the *Angophora, Corymbia, Lophostemon* and *Syncarpia* genera), often as a mixture of species.		
Dunn's white gum (Eucalyptus dunnii) moist forest in north-east New South Wales and south-east Queensland	Endangered	The canopy consists of *Eucalyptus dunnii* (Dunn's white gum) in pure stands or in combination with *E. saligna* (Sydney blue gum), *E. grandis* (Flooded gum), *E. microcorys* (Tallowwood) and *Lophostemon confertus* (Brush box). The ecological community is more commonly found at the margins of rainforests on the lower slopes of hills and escarpments and in the valley bottoms	No PCTs within the Development Footprint conform to the floristic characteristics of the TEC.	No
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	The ecological community typically occurs in low-lying coastal alluvial areas with minimal relief, such as swamps, floodplain pockets, depressions, alluvial flats, back-barrier flats, fans, terraces, and behind fore-dunes. The Coastal Swamp Sclerophyll Forest typically features a canopy and/or sub-canopy dominated by *Melaleuca* spp. and/or *Eucalyptus* robusta.	No PCTs within the Development Footprint conform to the floristic characteristics of the TEC.	No
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Coastal Swamp Oak Forest is often found in association with other vegetation types such as coastal saltmarsh, mangroves, freshwater wetlands, littoral rainforests or swamp sclerophyll forests in a 'mosaic' of coastal floodplain communities.	No PCTs within the Development Footprint conform to the floristic characteristics of the TEC.	No
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	The physical environment for the ecological community is coastal areas under regular or intermittent tidal influence. In southern latitudes saltmarsh is often the main vegetation-type in the intertidal zone and commonly occurs in association with estuaries	No PCTs within the Development Footprint conform to the floristic characteristics of the TEC	No

A-3-3 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 16: Potential occurrence assessment – flora

Scientific Name	Common Name	BCA	EPBC	Habitat requirements	Comments	Likelihood of occurrence
Acronychia littoralis	Scented Acronychia	E	E	Scented Acronychia occurs in transition zones between littoral rainforest and swamp sclerophyll forest; between littoral and coastal cypress pine communities; and margins of littoral forest.	Littoral rainforest in surrounding area, though without swamp sclerophyll nearby. 4 BioNet records.	Unlikely to occur
Alexfloydia repens	Floyd's Grass	E	-	Floyd's Grass occurs predominantly in swamp sclerophyll forest where Swamp Oak *Casuarina glauca* and/or Broad-leaved Paperbark *Melaleuca quinquenervia* are usually the dominant canopy species. The plant favours the moderate to high sunlight levels in this habitat.	Associated vegetation type not present on site. 123 BioNet records in the vicinity	Unlikely to occur
Allocasuarina thalassoscopica	-	-	E	This she-oak forms a dense, low, closed heath on the windswept south-facing upper slopes of Mount Coolum and along the coast from Noosa Heads in south-east Queensland to Diamond Beach in northern New South Wales.	Associated vegetation type not present on site.	Unlikely to occur
Arthraxon hispidus	Hairy-joint Grass	V	V	Moisture and shade-loving grass, found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps.	Associated vegetation types not present on site.	Unlikely to occur.

Scientific Name	Common Name	BCA	EPBC	Habitat requirements	Comments	Likelihood of occurrence
Boronia umbellata	Orara Boronia	V	V	This Boronia grows as an understorey shrub in and around gullies in wet open forest. It appears to regenerate well after disturbance, but it is not known whether prolonged or repeated disturbance affects long-term persistence.	Associated vegetation types not present on site. 1 BioNet record.	Unlikely to occur.
Coleus nitidus	Nightcap Plectranthus	E	E	Grows on rocky cliff-faces and boulders, in the shelter and shade provided by the adjacent rainforest and dry rainforest. Co-occurs with Plectranthus graveolens and Crofton Weed. Little is known of the ecology of this species.	Associated vegetation types not present on site.	Unlikely to occur.
Corynocarpus rupestris subsp. rupestris	Glenugie Karaka	V	V	Dry rainforest on steep basalt boulder slopes. Soil is scarce but relatively high in nutrients and very well-drained. Fire is generally excluded by the rocky terrain and absence of ground litter.	Associated vegetation types not present on site.	Unlikely to occur.
Cryptostylis hunteriana	Leafless Tongue-orchid	V	V	Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland.	Associated vegetation types not present on site.	Unlikely to occur.
Cynanchum elegans	White-flowered Wax Plant	E	E	The White-flowered Wax Plant usually occurs on the edge of dry rainforest vegetation.	Associated vegetation types not present on site.	Unlikely to occur.
Diospyros mabacea	Red-fruited Ebony	E	E	Usually grows as an understorey tree in lowland subtropical rainforest, often close to rivers. Soils are generally basalt-derived or alluvial.	Associated vegetation types not present on site. 1 BioNet record.	Unlikely to occur.
Diploglottis campbellii	Small-leaved Tamarind	E	E	Confined to the warm subtropical rainforests of the NSW-Queensland border lowlands and adjacent low ranges. The forest types in which the species occurs vary from lowland subtropical rainforest to drier subtropical rainforest with a Brush Box open overstorey.	Associated vegetation types not present on site. 1 BioNet record.	Unlikely to occur.
Diuris praecox	Rough Doubletail	V	V	Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey. Exists as subterranean tubers most of the year. It produces leaves and flowering stems in winter.	Some suitable habitat present, although in conditions that are unlikely to support this species. 1 BioNet record.	Unlikely to occur.
Eidothea hardeniana	Nightcap Oak	E	CE	The species occurs in upland warm temperate rainforest, usually near creeks.	Far outside the range of the species, 1 BioNet record in the vicinity	Unlikely to occur.

Scientific Name	Common Name	BCA	EPBC	Habitat requirements	Comments	Likelihood of occurrence
					likely to be a botanical garden record.	
Endiandra floydii	Crystal Creek Walnut	E	E	Warm temperate, subtropical rainforest or wet sclerophyll forest with Brush Box overstorey, and in and Camphor Laurel forest. The species can occur in disturbed and regrowth sites. The species generally prefers sheltered locations however it has been recorded on ridgelines, slopes, gullies and creek flats.	Associated vegetation types not present on site. 1 BioNet record.	Unlikely to occur.
Endiandra hayesii	Rusty Rose Walnut	V	V	Sheltered moist gullies in lowland subtropical and warm temperate rainforest on alluvium or basaltic soils. The species occurs in regrowth and highly modified forms of these habitats.	Associated vegetation types not present on site. 1 BioNet record.	Unlikely to occur
Eucalyptus glaucina	Slaty Red Gum	V	V	Grows in grassy woodland and dry eucalypt forest. Grows on deep, moderately fertile and well-watered soils.	Associated vegetation types and soil not present on site.	Unlikely to occur
Hakea archaeoides	Big Nellie Hakea	V	V	Found on steep, rocky, sheltered slopes and in deep gullies in open eucalypt forest. Commonly occurs at the interface of dry eucalypt forest and gully communities.	Associated vegetation types not present on site. 1 BioNet record.	Unlikely to occur
Haloragis exalata subsp. velutina	Tall Velvet Sea-berry	V	V	Grows in damp places near watercourses. This subspecies also occurs in woodland on the steep rocky slopes of gorges.	Associated vegetation types and soil not present on site	Unlikely to occur
Hicksbeachia pinnatifolia	Monkey Nut, Bopple Nut,	V	V	Subtropical rainforest, moist eucalypt forest and Brush Box forest.	Some suitable habitat present, although in conditions that are unlikely to support this species.	Unlikely to occur
Leichhardtia longiloba	Clear Milkvine	E	V	Subtropical and warm temperate rainforest, lowland moist or open eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops.	Associated vegetation types and soil not present on site	Unlikely to occur
Lindsaea incisa	Slender Screw Fern	E	-	Lindsea incisa is usually found in waterlogged or poorly drained sites along creeks, dominated by Paperbarks where ferns, sedges are common. Moist shrubby eucalypt forest on metasediments.	Associated vegetation types and soil not present on site. 4 BioNet records.	Unlikely to occur
Macadamia integrifolia	Macadamia Nut	-	V	In drier types of subtropical rainforest north from Currumbin in Qld. It is not	Associated vegetation types	Unlikely to occur

Scientific Name	Common Name	BCA	EPBC	Habitat requirements	Comments	Likelihood of occurrence
				known to occur naturally in the wild in N.S.W.	and soil not present on site	
Macadamia tetraphylla	Rough-shelled Bush Nut	V	V	Found in subtropical rainforest, usually near the coast.	Some suitable habitat present, although in conditions that are unlikely to support this species. 1 BioNet record.	Unlikely to occur
Marsdenia longiloba	Slender Marsdenia	E	V	Subtropical and warm temperate rainforest, lowland moist or open eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops.	Suitable habitat on site although highly disturbed. 72 BioNet records, none within close distance of the Subject Land.	Unlikely to occur
Niemeyera whitei	Rusty Plum	V	-	Found in gully, warm temperate or littoral rainforests and the adjacent understorey of moist eucalypt forest.	Associated vegetation types and soil not present on site. 135 BioNet records in region, most concentrated westwards amongst more varying topography.	Unlikely to occur
Oberonia complanata	Yellow-flowered King of the Fairies	E	-	This species grows on trees and rocks in littoral rainforest, subtropical rainforest, dry rainforest, wet or dry eucalypt forests, dunes (including stabilised sands), stream-side areas, swampy forests and mangroves.	Littoral rainforest occurs in the surrounding areas though due to the state of the Subject Land there are no rocks or trees suitable for this species. 1 BioNet record.	Unlikely to occur
Owenia cepiodora	Onionwood	V	V	Subtropical and dry rainforest on or near soils derived from basalt.	Associated vegetation types and soil not present on site	Unlikely to occur
Parsonsia dorrigoensis	Milky Silkpod	V	E	Found in subtropical and warm-temperature rainforest, on rainforest margins, and in moist eucalypt forest up to 800 m, on brown clay soils.	Associated vegetation types and soil not present on site.	Unlikely to occur
Peristeranthus hillii	Brown Fairy-chain Orchid	V	-	Restricted to coastal and near-coastal environments, particularly Littoral Rainforest and the threatened ecological community Lowland Rainforest on Floodplain. The species is an epiphyte, growing in clumps on tree trunks and thick vines.	Littoral rainforest occurs in the surrounding areas though due to the state of the Subject Land it is unlikely to support this species. 1 BioNet record.	
Persicaria elatior	Knotweed	V	V	This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	Associated vegetation types and soil not present on site. 2 BioNet records.	Unlikely to occur
Phaius australis	Lesser Swamp-orchid	E	E	Swampy grassland or swampy forest including rainforest,	Associated vegetation types and soil not present	Unlikely to occur

Scientific Name	Common Name	BCA	EPBC	Habitat requirements	Comments	Likelihood of occurrence
				eucalypt or paperbark forest, mostly in coastal areas.	on site. 4 Bionet records.	
Pultenaea maritima	Coast Headland Pea	V	-	The species occurs in grasslands, shrublands and heath on exposed coastal headlands and adjoining low coastal heath.	Subject Land occurs on a headland, though not within an exposed area. 37 BioNet records on a headland to the south - Macauleys Headland	Unlikely to occur
Quassia sp. Moonee Creek	Moonee Quassia	E	E	Shrubby layer below tall moist eucalypt forest and tall dry eucalypt forest, including forest edges, mostly at lower altitudes.	Associated vegetation types and soil not present on site. 1 BioNet record.	Unlikely to occur
Rhodamnia rubescens	Scrub Turpentine	E	CE	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Some suitable habitat present on site though in a disturbed state. 26 BioNet records	Unlikely to occur
Rhodomyrtus psidioides	Native Guava	CE	CE	Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	Associated vegetation types and soil not present on site. 39 BioNet records.	Unlikely to occur
Samadera sp. Moonee Creek	-	E	E	Occurs as an understorey shrub most commonly in moist shrubby open eucalypt forest on slopes or riparian rainforest gullies, and occasionally in dry open forest with a heathy understorey.	Associated vegetation types and soil not present on site.	Unlikely to occur
Sarcochilus fitzgeraldii	Ravine Orchid	V	V	The Ravine Orchid grows mainly on rocks, amongst organic matter, in cool, moist, shady ravines, gorges and on cliff faces in dense subtropical rainforest at altitudes between 500 and 700 m.	Associated vegetation types and soil not present on site. 1 BioNet record.	Unlikely to occur
Senna acclinis	Rainforest Cassia	E	-	Grows on the margins of subtropical, littoral and dry rainforests. Often found as a gap phase shrub.	Suitable habitat on site although highly disturbed.1 BioNet record.	Unlikely to occur
Sophora tomentosa	Silverbush	E	-	Silverbush occurs on coastal dunes. Seeds may be dispersed by sea currents.	Associated vegetation types and soil not present on site. 66 BioNet records along foreshore.	Unlikely to occur
Syzygium hodgkinsoniae	Smooth-bark Rose Apple	V	V	Usually found in riverine and subtropical rainforest on rich alluvial or basaltic soils.	Associated vegetation types and soil not present on site	Unlikely to occur
Thesium australe	Austral Toadflax	V	V	Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast.	Suitable habitat on site although highly disturbed.11 BioNet records near the Subject Land and on adjacent headland.	Unlikely to occur
Typhonium sp. aff. brownii	Stinky Lily	V	-	Occurs on reasonably fertile soils, in moist eucalypt forest	Associated vegetation types	Unlikely to occur

Scientific Name	Common Name	BCA	EPBC	Habitat requirements	Comments	Likelihood of occurrence
				and the moist eucalypt forest-subtropical rainforest interface. Its remaining habitat is now significantly disturbed.	and soil not present on site. 1 Bionet record.	
Uromyrtus australis	Peach Myrtle	E	E	Warm temperate rainforest on less fertile soils derived from rhyolite rock. Often associated with Coachwood (*Ceratopetalum apetalum*).	Associated vegetation types and soil not present on site. 2 BioNet records	
Vincetoxicum woollsii	-	E	E	It is a rare vine found in New South Wales and Queensland, lack of information regarding specific habitats.	-	Unlikely to occur
Zieria prostrata	Headland Zieria	E	E	Low grassy heath on exposed sites and wind-pruned open to sparse shrubland on more sheltered aspects.	Associated vegetation types and soil not present on site. 2 BioNet records	Unlikely to occur
Zieria smithii	Low growing form of Z. smithii, Diggers Head	E	-	Occurs in low heath with Kangaroo Grass (Themeda australis) on a coastal headland.	Associated vegetation types and soil not present on site. 2 BioNet records	Unlikely to occur
Key: Critically Endangered (CE), Endangered (E), Vulnerable (V)						

Table 17: Potential occurrence assessment – fauna

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
Amphibians/Fish						
Assa darlingtoni	Pouched Frog	V	-	Pouched frogs live in cool, moist rainforest, including Antarctic Beech, or moist eucalypt forest in mountainous areas, mostly above 800 m but have been found as low as 300m.	Suitable habitat not present within the Subject Land.	Unlikely to occur
Crinia tinnula	Wallum Froglet	V	-	Wallum Froglets are found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. They typically occur in sedgelands and wet heathlands.	Suitable habitat not present within the Subject Land. 16 BioNet records.	Unlikely to occur

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
Litoria aurea	Green and Golden Bell Frog	E	V	Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (Gambusia holbrooki), have a grassy area nearby and diurnal sheltering sites available.	Suitable habitat not present within the Subject Land.	Unlikely to occur
Litoria olongburensis	Wallum Sedge Frog	V	V	The Olongburra Frog is an "acid" frog confined to the coastal sandplain wallum swamps. Their life-cycle is adapted to the acidic pH (2.8-5.5) of these wetlands. Frogs are highest in abundance in relatively undisturbed wallum swamps.	Suitable habitat not present within the Subject Land.	Unlikely to occur
Mixophyes balbus	Stuttering Frog	E	V	Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range.	Some suitable habitat present within the Subject Land.	Unlikely to occur
Mixophyes iteratus	Giant Barred Frog	E	V	Giant Barred Frogs are found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation.	Suitable habitat not present within the Subject Land. 33 BioNet records.	Unlikely to occur
Philoria sphagnicolus	Sphagnum Frog	V	V	They are typically found in high rainfall areas at high elevation in Sphagnum Moss beds or seepages on steep slopes.	Suitable habitat not present within the Subject Land.	Unlikely to occur
Reptiles						
Harrisoniascincus zia	Rainforest Cool-skink	-	V	The rainforest cool-skink is most likely to persist at higher elevation (> 700 m) and/or rocky areas as climate change impacts progress. Higher elevation and/or rocky areas that have the potential to be restored to provide habitat for the rainforest cool-skink	Suitable habitat not present within the Subject Land.	Unlikely to occur

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
				are also critical to the survival of this species		
Hoplocephalus stephensii	Stephen's Banded Snake	V	-	Rainforest and eucalypt forests and rocky areas up to 950 m in altitude.	Some habitat present, though disturbed. 11 BioNet records in region.	Unlikely to occur
Birds						
Amaurornis moluccana	Pale-vented Bush-hen	V	-	Inhabits tall dense understorey or ground-layer vegetation on the margins of freshwater streams and natural or artificial wetlands, usually within or bordering rainforest, rainforest remnants or forests.	Suitable habitat not present within the Subject Land. 4 Bionet records.	Unlikely to occur
Anthochaera phrygia	Regent Honeyeater	CE	CE	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak.	Suitable habitat not present within the Subject Land. 3 Bionet records.	Unlikely to occur
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Primarily inhabit dry, open eucalypt forests and woodlands,	Suitable habitat not present within the Subject Land. 1 BioNet record.	Unlikely to occur
Atrichornis rufescens	Rufous Scrub-bird	V	E	Are now confined to high-altitude (above 600m elevation) subtropical, warm temperate and cool temperate rainforests, and wet sclerophyll forests.	Suitable habitat not present within the Subject Land. 1 BioNet record.	Unlikely to occur
Botaurus poiciloptilus	Australasian Bittern	E	E	Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (Typha spp.) and spikerushes (Eleocharis spp.).	Suitable habitat not present within the Subject Land.	Unlikely to occur.
Burhinus grallarius	Bush Stone-curlew	E	-	Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber.	Suitable habitat not present within the Subject Land. 2 BioNet records.	Unlikely to occur.
Callocephalon fimbriatum	Gang-gang Cockatoo	V	E	In spring and summer, generally found in tall mountain forests and woodlands, particularly	Suitable habitat not present within the	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
				in heavily timbered and mature wet sclerophyll forests.	Subject Land. 1 BioNet record	
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, Allocasuaraina diminuta, and A. gymnathera.	Suitable habitat not present within the Subject Land. 50 BioNet records.	Unlikely to occur.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	V	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts	Suitable habitat not present within the Subject Land. 1 BioNet records.	Unlikely to occur.
Coracina lineata	Barred Cuckoo-shrike	V	-	Rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses. They are usually seen in pairs or small flocks foraging among foliage of trees for insects and fruit. They are active birds, frequently moving from tree to tree.	Suitable habitat not present within the Subject Land. 5 BioNet records	Unlikely to occur.
Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	CE	E	Usually recorded from drier rainforests and adjacent wetter eucalypt forest but rarely seen due to its small size and cryptic habits. Also found in the wetter lowland rainforests that are now largely cleared in NSW.	Suitable habitat not present within the Subject Land. 3 BioNet records	Unlikely to occur.
Daphoenositta chrysoptera	Varied Sittella	V	-	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Suitable habitat not present within the Subject Land. 18 BioNet records	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
Diomedea antipodensis gibsoni	Gibson's Albatross	V	V	The species is regularly encountered on trans-Tasman shipping routes and at seas off Sydney, and regularly occurs off the NSW coast usually between Green Cape and Newcastle.	Suitable habitat not present within the Subject Land.	Unlikely to occur.
Dromaius novaehollandiae	Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	E	-	On the NSW north coast, Emus occur in a range of predominantly open lowland habitats, including grasslands, heathland, shrubland, open and shrubby woodlands, forest, and swamp and sedgeland communities, as well as the ecotones between these habitats. They also occur in plantations of tea-tree and open farmland, and occasionally in littoral rainforest.	Suitable habitat not present within the Subject Land. 2 BioNet record.	Unlikely to occur.
Ephippiorhynchus asiaticus	Black-necked Stork	E	-	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.	Suitable habitat not present within the Subject Land. 6 BioNet record.	Unlikely to occur.
Erythrotriorchis radiatus	Red Goshawk	E	E	In NSW, preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus forest of coastal rivers.	Suitable habitat not present within the Subject Land.	Unlikely to occur.
Falco hypoleucos	Grey Falcon	V	V	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	Suitable habitat not present within the Subject Land.	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
Fregetta grallaria grallaria	White-bellied Storm-Petrel (Tasman Sea)	V	V	Marine In Australia breeds only on offshore islands in the Lord Howe Island group. Nest consists of a chamber usually located amongst large rocks.	Suitable habitat not present within the Subject Land.	Unlikely to occur.
Glossopsitta pusilla	Little Lorikeet	V	-	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity.	Suitable habitat not present within the Subject Land. 11 BioNet records	Unlikely to occur.
Grantiella picta	Painted Honeyeater	V	V	Inhabits Boree/ Weeping Myall (Acacia pendula), Brigalow (A. harpophylla) and Box-Gum Woodlands and Box-Ironbark Forests.	Suitable habitat not present within the Subject Land.	Unlikely to occur.
Haematopus fuliginosus	Sooty Oystercatcher	V	-	Favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	Suitable habitat not present within the Subject Land. 45 Bionet records	Unlikely to occur.
Haematopus longirostris	Pied Oystercatcher	E	-	Favours intertidal flats of inlets and bays, open beaches and sandbanks.	Suitable habitat not present within the Subject Land. 23 Bionet records	Unlikely to occur.
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest).	Some Suitable habitat present within the Subject Land although not sufficient feeding grounds for such a large bird. 14 BioNet records in region.	Unlikely to occur.
Hieraaetus morphnoides	Little Eagle	V	-	Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and	Suitable habitat not present within the	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
				riparian woodlands of interior NSW are also used.	Subject Land. 1 Bionet records	
Ixobrychus flavicollis	Black Bittern	V	-	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	Suitable habitat not present within the Subject Land. 4 BioNet records	Unlikely to occur.
Lathamus discolor	Swift Parrot	E	CE	On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations.	Suitable habitat not present within the Subject Land. 9 BioNet records.	Unlikely to occur
Limosa lapponica baueri	Nunivak Bar-tailed Godwit	-	E	Usually forage near the edge of water or in shallow water within tidal estuaries and harbours (Higgins & Davies 1996). Most feeding takes place on exposed sandy or soft mud substrates on intertidal flats and beaches	Suitable habitat not present within the Subject Land.	Unlikely to occur
Lophoictinia isura	Square-tailed Kite	V	-	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.	Suitable habitat not present within the Subject Land. 9 BioNet records.	Unlikely to occur
Melanodryas cucullata cucullata	Hooded Robin (south-eastern)	V	-	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas.	Suitable habitat not present within the Subject Land.	Unlikely to occur
Neophema chrysostoma	Blue-winged Parrot	-	V	Throughout their range, they favour grasslands and grassy woodlands. They are often found near	Suitable habitat not present within Subject Land.	Unlikely to occur

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
				wetlands both near the coast and in semi-arid zones.		
Ninox connivens	Barking Owl	V	-	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils.	Suitable habitat not present within Subject Land. 2 BioNet records.	Unlikely to occur
Ninox strenua	Powerful Owl	V	-	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest.	No hollow bearing trees present on the Subject Land. 27 BioNet records within the region.	Unlikely to occur
Onychoprion fuscata	Sooty Tern	V	-	Large flocks can be seen soaring, skimming and dipping but seldom plunging in off shore waters. Breeds in large colonies in sand or coral scrapes on offshore islands and cays including Lord Howe and Norfolk Islands.	Suitable habitat not present within Subject Land. 2 BioNet records.	Unlikely to occur
Pachyptila turtur subantarctica	Fairy Prion (southern)	V	-	The burrows of fairy prions (southern) are usually in crevices, in hollows beneath cushions of *Colobanthus muscoides*.	Suitable habitat not present within Subject Land.	Unlikely to occur
Phaethon rubricauda	Red-tailed Tropicbird	V	-	Breeds in coastal cliffs and under bushes in tropical Australia. Nests on cliffs of the northern hills and southern mountains on the main island at Lord Howe Island.	Suitable habitat not present within Subject Land. 1 BioNet record.	Unlikely to occur

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
Pterodroma nigripennis	Black-winged Petrel	V	-	Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions.	Suitable habitat not present within Subject Land. 1 BioNet record.	Unlikely to occur
Pterodroma leucoptera leucoptera	Gould's Petrel	V	E	Principal nesting habitat is located within two gullies which are characterised by steeply, sloping rock scree with a canopy of Cabbage Tree Palms.	Suitable habitat not present within Subject Land.	Unlikely to occur
Pterodroma neglecta neglecta	Kermadec Petrel (western)	V	V	Nests in a crevice amongst rocks.	Suitable habitat not present within Subject Land.	Unlikely to occur
Ptilinopus magnificus	Wompoo Fruit-Dove	V	-	Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests.	Suitable habitat not present within Subject Land. 65 BioNet records	Unlikely to occur
Ptilinopus regina	Rose-crowned Fruit-Dove	V	-	Rose-crowned Fruit-doves occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful.	Suitable habitat not present within Subject Land. 20 BioNet records.	Unlikely to occur
Ptilinopus superbus	Superb Fruit-Dove	V	-	Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees.	Suitable habitat not present within Subject Land. 1 BioNet record.	Unlikely to occur
Rostratula australis	Australian Painted Snipe	E	E	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	Suitable habitat not present within Subject Land.	Unlikely to occur
Stagonopleura guttata	Diamond Firetail	V	-	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow	Suitable habitat not present within Subject Land.	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
				Gum Eucalyptus pauciflora Woodlands.		
Sternula albifrons	Little Tern	E	-	Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records)	Suitable habitat not present within Subject Land. 7 BioNet records.	Unlikely to occur.
Sternula nereis nereis	Australian Fairy Tern	-	V	Fairy Terns nest above the high water mark often in clear view of the water and on sites where the substrate is sandy and the vegetation low and sparse. Nests typically consist of a shallow scrape in the sand which is often lined with small shells and vegetation	Suitable habitat not present within Subject Land.	Unlikely to occur.
Sula dactylatra	Masked Booby	V	-	Remain at Lord Howe Island year round but range widely for food and some juveniles wander before returning to breed. Young birds banded on Lord Howe Island have been recovered as far away as the Solomon Islands.	Suitable habitat not present within Subject Land. 1 Bionet record.	Unlikely to occur.
Thalassarche bulleri platei	Buller's Albatross, Pacific Albatross	-	V	The Pacific Albatross prefers waters of the East Australia Current where sea surface-temperatures are greater than 16.5 °C	Suitable habitat not present within Subject Land.	Unlikely to occur.
Todiramphus chloris	Collared Kingfisher	V	-	Collared Kingfishers are virtually restricted to mangrove associations of estuaries, inlets, sheltered bays and islands, and the tidal flats and littoral zone bordering mangroves	Suitable habitat not present within Subject Land. 8 BioNet records.	Unlikely to occur.
Turnix melanogaster	Black-breasted Button-quail	CE	V	Preferred habitat includes drier low closed forests, including dry	Suitable habitat not present within Subject Land.	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
				rainforests, vine forest and vine thickets, often in association with Hoop Pine, and Bottletree scrubs.		
Tyto tenebricosa	Sooty Owl	V	-	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	No hollow bearing trees present on the Subject Land. 12 BioNet records	Unlikely to occur.
Mammals						
Chalinolobus dwyeri	Large-eared Pied Bat	V	E	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel), frequenting low to mid-elevation dry open forest and woodland close to these features.	Suitable habitat not present within Subject Land.	Unlikely to occur
Dasyurus maculatus	Spotted-tailed Quoll	V	V	Recorded in the rainforest, open forest woodland, coastal heath and inland riparian forest.	Suitable habitat not present within Subject Land due to disturbance. 9 BioNet records	Unlikely to occur
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	-	Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	No suitable habitat present within the Subject Land. 2 BioNet record	Unlikely to occur
Miniopterus australis	Little Bent-winged Bat	V	-	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas.	Suitable habitat present, though disturbed. 23 Bionet records	Unlikely to occur
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	No suitable habitat present within the Subject Land. 9 BioNet records	Unlikely to occur
Myotis macropus	Southern Myotis	V	-	Generally roost in groups of 10 - 15	No suitable habitat present	Unlikely to occur

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
				close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.	within theSubject Land. 5 BioNet records	
Notamacropus parma	Parma Wallaby	V	V	Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	No suitable habitat present within the Subject Land.	Unlikely to occur
Nyctophilus bifax	Eastern Long-eared Bat	V	-	Lowland subtropical rainforest and wet and swamp eucalypt forest, extending into adjacent moist eucalypt forest. Coastal rainforest and patches of coastal scrub are particularly favoured.	No suitable habitat present within the Subject Land. 4 BioNet records.	Unlikely to occur
Petauroides volans	Southern Greater Glider	E	E	Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range.	No hollow bearing trees present on site.	Unlikely to occur.
Petaurus australis	Yellow-bellied Glider	V	V	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils	No hollow bearing trees present on site. 6 BioNet records.	Unlikely to occur.
Petaurus norfolcensis	Squirrel Glider	V	-	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas.	No suitable habitat present within the Subject Land. 19 Bionet records.	Unlikely to occur
Phascogale tapoatafa	Brush-tailed Phascogale	V	-	Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest	Suitable habitat not present within Subject Land. 1 BioNet record.	Unlikely to occur

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
				and wet sclerophyll forest.		
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)	Koala	E	E	Inhabit eucalypt woodlands and forests.	No signs of Koalas present on site. 524 BioNet records in region.	Unlikely to occur
Phoniscus papuensis	Golden-tipped Bat	V	-	Found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. Also recorded in tall open forest, Casuarina-dominated riparian forest and coastal Melaleuca forests.	Suitable habitat not present within Subject Land. 2 BioNet records.	Unlikely to occur
Planigale maculata	Common Planigale	V	-	Common Planigales inhabit rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water.	Some suitable habitat present on Subject Land. 1 BioNet records.	Unlikely to occur
Potorous tridactylus tridactylus	Long-nosed Potoroo	V	V	Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas.	Suitable habitat not present within Subject Land.	Unlikely to occur
Pseudomys novaehollandiae	New Holland Mouse, Pookila	-	V	The New Holland Mouse has been found from coastal areas and up to 100 km inland on sandstone country	Suitable habitat not present within Subject Land.	Unlikely to occur
Pteropus poliocephalus	Grey-headed Flying Fox	V	V	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	Suitable habitat not present within Subject Land. 161 BioNet records.	Unlikely to occur
Syconycteris australis	Common Blossom-bat	V	-	Common Blossom-bats often roost in littoral rainforest and feed on nectar and pollen from flowers in adjacent heathland and	Suitable habitat not present within Subject Land. 3 BioNet records	Unlikely to occur

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
				paperbark swamps. They have also been recorded in a range of other vegetation communities, such as subtropical rainforest, wet sclerophyll forest and other coastal forests.		
Thylogale stigmatica	Red-legged Pademelon	V	-	Inhabits forest with a dense understorey and ground cover, including rainforest, moist eucalypt forest and vine scrub. Wet gullies with dense, shrubby ground cover provide shelter from predators.	Suitable habitat not present within Subject Land. 1 BioNet records	Unlikely to occur
Vespadelus troughtoni	Eastern Cave Bat	V	-	A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals.	Suitable habitat not present within Subject Land. 1 BioNet records	Unlikely to occur
Argynnis hyperbius inconstans	Australian Fritillary	E	CE	The Australian Fritillary is found in open swampy coastal habitat.	Suitable habitat not present within Subject Land.	Unlikely to occur
Ocybadistes knightorum	Black Grass-dart Butterfly	E	-	The Black Grass-dart Butterfly is considered to be monophageous, with Floyd's Grass Alexfloydia repens being the only larval food plant known. The butterfly is generally restricted to within about 50m of suitable patches of Floyd's Grass.	Suitable habitat not present within Subject Land. 39 BioNet records	Unlikely to occur
Phyllodes imperialis smithersi	Pink Underwing Moth	E	E	The Southern Pink Underwing Moth is found in subtropical rainforest below about 600 m elevation. Potential breeding habitat is restricted to areas where the caterpillar's food plant,	Suitable habitat not present within Subject Land.	Unlikely to occur

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Comments	Likelihood of Occurrence **
				a native rainforest vine, Carronia multisepalea, occurs in subtropical rainforest.		
Key: Critically Endangered (CE), Endangered (E), Vulnerable (V)						

A-3-4 Migratory Species

No migratory species were recorded during the survey. A total of 64 EPBC Act-listed terrestrial migratory bird species are known or considered potential occurrences in the locality were identified by desktop searches (DCCEEW 2020).

These species are shown in Table 17, with an evaluation made on the likelihood of occurrence based on cited ecology.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Habitat Present	Likelihood of Occurrence**
Birds						
Actitis hypoleucos	Common Sandpiper	-	-	Inhabits most coastal and interior wetlands. This species does not breed in the southern hemisphere (DES, 2020).	Habitat is not present on site.	Unlikely to occur.
Anous stolidus	Common Noddy	-	-	Usually occurs on or near islands, on rocky islets and stacks with precipitous cliffs, or on shoals or cays of coral or sand.	Habitat is not present on site.	Unlikely to occur.
Apus pacificus	Fork-tailed Swift	-	-	Occurs mostly over large inland plains but sometimes over foothills or in coastal areas.	Habitat is not present on site.	Unlikely to occur.
Ardenna carneipes	Flesh-footed Shearwater	-	-	Pairs breed on islands in burrows on sloping ground in coastal forest, scrubland, shrubland or grassland	Habitat is not present on site. 1 BioNet record.	Unlikely to occur.
Ardenna grisea	Sooty Shearwater	-	V	Birds nest in burrows or rock crevices on coastal slopes, ridges and cliff tops, in herbfields, tussock grassland or forest.	Habitat is not present on site.	Unlikely to occur.
Ardenna pacifica	Wedge-tailed Shearwater	-	-	Usually excavates burrows on flat or	Habitat is not present on site.	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Habitat Present	Likelihood of Occurrence**
				flattish areas with dense grassy and tussocky vegetation but much depends on the nature of soil and terrain, as at some sites burrows are below the cover of trees and shrubs.		
Ardenna tenuirostris	Short-tailed Shearwater	-	-	Colonies can be found in coastal areas from New South Wales through Western Australia, with the majority found through Bass Strait and around Tasmania.	Habitat is not present on site.	Unlikely to occur.
Calidris acuminata	Sharp-tailed Sandpiper	-	V	Has a diverse habitat range of coastal and inland wetlands with preference to beaches, salt fields, mudflats and temporary floodwaters.	Habitat is not present on site.	Unlikely to occur.
Calidris canutus	Red Knot, Knot	-	V	Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Habitat is not present on site.	Unlikely to occur.
Calidris ferruginea	Curlew Sandpiper	-	CE	Inhabits inter-tidal and coastal waterways, mudflats and estuaries. Also prefers inland lakes and sewage ponds.	Habitat is not present on site.	Unlikely to occur.
Calidris melanotos	Pectoral Sandpiper	-	-	Typically found in freshwater habitats usually coastal or near-coastal.	Habitat is not present on site.	Unlikely to occur.
Calonectris leucomelas	Streaked Shearwater	-	-	Nests in burrows. It prefers forested hills.	Habitat is not present on site.	Unlikely to occur.
Charadrius leschenaultii	Greater Sand Plover	-	V	They usually roost on sand-spits and banks on beaches or in tidal lagoons, and occasionally on rocky points	Habitat is not present on site.	Unlikely to occur.
Cuculus optatus	Oriental Cuckoo	-	-	It mainly inhabits forests, occurring in coniferous, deciduous	Habitat is not present on site.	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Habitat Present	Likelihood of Occurrence**
				and mixed forest. It feeds mainly on insects and their larvae, foraging for them in trees and bushes as well as on the ground.		
Diomedea antipodensis	Antipodean Albatross	-	V	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.
Diomedea epomophora	Southern Royal Albatross	-	V	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.
Diomedea exulans	Wandering Albatross	-	V	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.
Fregata ariel	Lesser Frigatebird	-	-	Roosts in forested areas.	Habitat is not present on site.	Unlikely to occur.
Fregata minor	Great Frigatebird	-	--	Roosts in forested areas.	Habitat is not present on site.	Unlikely to occur.
Gallinago hardwickii	Latham's Snipe	-	-	Typical habitat includes low vegetation around coastal and inland waterways	Habitat is not present on site.	Unlikely to occur.
Gallinago megala	Swinhoe's Snipe	-	-	Occurs at the edges of wetlands, such as wet paddy fields, swamps and freshwater streams.	Habitat is not present on site.	Unlikely to occur.
Gallinago stenura	Pin-tailed Snipe	-	-	Occurs most often in or at the edges of shallow freshwater swamps, ponds and lakes with emergent, sparse to dense cover of grass/sedge or other vegetation.	Habitat is not present on site.	Unlikely to occur.
Hirundapus caudacutus	White-throated Needletail	-	V	The White-throated Needletail is an aerial species flying up to 1000m over forests or coastal heathlands.	Habitat is not present on site.	Unlikely to occur.
Macronectes giganteus	Southern Giant-Petrel, Southern Giant Petrel	E	E	Common visitor off the coast of NSW.	Habitat is not present on site.	Unlikely to occur.
Macronectes halli	Northern Giant Petrel	V	V	They are a common visitor in NSW waters, predominantly along	Habitat is not present on site.	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Habitat Present	Likelihood of Occurrence**
				the south-east coast during winter and autumn.		
Monarcha melanopsis	Black-faced Monarch	-	-	The Black-faced Monarch mainly occurs in rainforest ecosystems, although sometimes in wet sclerophyll forest as well.	Suitable habitat is present on site.	Unlikely to occur.
Myiagra cyanoleuca	Satin Flycatcher	-	-	Satin flycatchers inhabit heavily wooded gullies dominated with eucalypt species.	Habitat is not present on site.	Unlikely to occur.
Numenius madagascariensis	Eastern Curlew	-	CE	Mainly forages around sheltered intertidal sandflats or mudflats that are open and without vegetation or seagrass. The species often also forages near mangroves, on saltflats or saltmarsh, around rockpools, amongst rubble on coral reefs, and on ocean beaches near the tideline	Habitat is not present on site.	Unlikely to occur.
Numenius minutus	Little Curlew	-	-	Most often found feeding in short, dry grassland and sedgeland, including dry floodplains and blacksoil plains, which have scattered, shallow freshwater pools or areas seasonally inundated.	Habitat is not present on site.	Unlikely to occur.
Pandion haliaetus	Osprey	V	-	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes.	Suitable habitat not present within Subject Land. 45 BioNet records.	Unlikely to occur
Phaethon lepturus	White-tailed Tropicbird	-	-	It disperses widely across the oceans when not breeding, and sometimes wanders far.	Habitat is not present on site.	Unlikely to occur.
Phoebetria fusca	Sooty Albatross	V	V	This pelagic or ocean-going species inhabits subantarctic and subtropical marine waters, spending the	Habitat is not present on site.	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Habitat Present	Likelihood of Occurrence**
				majority of its time at sea, and rarely occurs in continental shelf waters.		
Rhipidura rufifrons	Rufous Fantail	-	CE	Confined to high altitude (above 600m elevation) subtropical, warm temperature and cool temperate rainforests and wet sclerophyll forests.	Habitat present on site, though disturbed	Unlikely to occur.
Sternula albifrons	Little Tern	E	-	Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records).	Suitable habitat not present within Subject Land. 7 BioNet records	Unlikely to occur.
Symposiachrus trivirgatus	Spectacled Monarch	-	-	Natural habitats are subtropical or tropical moist lowland forests, subtropical or tropical mangrove forests, and subtropical or tropical moist montane forests.	Habitat is not present on site.	Unlikely to occur.
Thalassarche bulleri	Buller's Albatross, Pacific Albatross	-	V	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.
Thalassarche carteri	Indian Yellow-nosed Albatross	-	V	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.
Thalassarche cauta	Shy Albatross	E	E	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.
Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross	-	V	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.
Thalassarche melanophris	Black-browed Albatross	V	V	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.
Thalassarche salvini	Salvin's Albatross	-	V	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.
Thalassarche steadi	White-capped Albatross	-	V	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.
Thalasseus bergii	Greater Crested Tern	-	-	Marine, pelagic and aerial	Habitat is not present on site.	Unlikely to occur.

Scientific Name	Common Name	BCA*	EPBC*	Required Habitat	Habitat Present	Likelihood of Occurrence**
Tringa nebularia	Common Greenshank, Greenshank	-	E	It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass.	Habitat is not present on site.	Unlikely to occur.
Key: Critically Endangered (CE), Endangered (E), Vulnerable (V), Not Listed (NL).						

A-3-5 Conclusion

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

A-4 Site Vegetation List

Table 18: Flora species recorded on the Subject Land

Common Name	Scientific Name	BC Act Status	EPBC Act Status
Canopy Trees			
Brush Box	*Lophostemon confertus*		
Tuckeroo	*Cupaniopsis anacardioides*		
Lilly Pilly	*Acmena smithii*		
Native Tamarind	*Diploglottis australis*		
Narrow-leaved Ironbark	*Eucalyptus crebra*		
Myrtle Ebony	*Diospyros pentamera*		
Foambark Tree	*Jagera pseudorhus*		
Three-veined Cryptocarya	*Cryptocarya triplinervis*		
White Fig*	*Ficus virens**		
White Cypress Pine	*Callitris columellaris*		
Yellow Butterfly Palm*	*Dypsis lutescens**		
Umbrella Tree*	*Schefflera actinophylla**		
Sour Orange*	*Citrus X aurantium**		
Shrubs			
Scentless Rosewood	*Synoum glandulosum*		
Veiny Wilkiea	*Wilkiea huegeliana*		
Orange Thorn	*Pittosporum multiflorum*		
Logan Apple	*Acronychia imperforata*		
Creek Sandpaper Fig	*Ficus coronata*		
Beach Alectryon	*Alectryon coriaceus*		
Bolwarra	*Eupomatia laurina*		
Scentless Rosewood	*Synoum glandulosum*		
Veiny Wilkiea	*Wilkiea huegeliana*		
Orange Thorn	*Pittosporum multiflorum*		
Grasses			
Pademelon Grass	*Ottochloa gracillima*		
Spiny-headed Mat-rush	*Lomandra longifolia*		
Common Couch	*Cynodon dactylon*		
Groundcovers			
	Ottochloa gracillima		
Spiny-headed Mat-rush	*Lomandra longifolia*		
Common Couch	*Cynodon dactylon*		
Narrow-leaved Palm Lily	*Cordyline stricta*		

Common Name	Scientific Name	BC Act Status	EPBC Act Status
Water Vine	*Cissus antarctica*		
Blue Flax-lily	*Dianella caerulea*		
Sweet Morinda	*Gynochthodes jasminoides*		
Wombat Berry	*Eustrephus latifolius*		
whiteroot	*Lobelia purpurascens*		
Fleabane*	*Vernonia cinerea**		
	Mangifera spp.		
Fruit Salad Plant*	*Monstera deliciosa**		
Umbrella Tree*	*Schefflera actinophylla**		
Yellow Butterfly Palm*	*Dypsis lutescens**		
Crofton Weed*	*Ageratina Adenophora**		
Catsear*	*Hypochoeris radicata**		
Cobbler's Pegs*	*Bidens pilosa**		
Singapore Daisy*	*Sphagneticola trilobata**		
Easter Cassia*	*Senna pendula**		
Vines			
Water Vine	*Cordyline stricta*		
Lawyer Vine	*Smilax australis*		
Key: Exotic species (*)			

A-5 Biodiversity Credit Report

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00049982/BAAS23020/24/00049983	Keiley Hunter Tolhurst Estate	14/03/2024
Assessor Name	Report Created	BAM Data version *
Lachlan Gerald Webster	13/09/2024	67
Assessor Number	BAM Case Status	Date Finalised
BAAS23020	Finalised	13/09/2024
Assessment Revision	Assessment Type	BOS entry trigger
1	Part 4 Developments (Small Area)	BOS Threshold: Biodiversity Values Map

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

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

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

Mid North Headland Brush Box Littoral Rainforest												
1	3127_Grassland	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	6.9	6.9	0.58	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		0
2	3127_Degraded	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	6.3	6.3	0.12	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		0
											Subtotal	**0**
											Total	**0**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
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Assessor Name	Report Created	BAM Data version *
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Assessor Number	BAM Case Status	Date Finalised
BAAS23020	Finalised	13/09/2024
Assessment Revision	Assessment Type	BOS entry trigger
1	Part 4 Developments (Small Area)	BOS Threshold: Biodiversity Values Map

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

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

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2	3127_Degraded	Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	6.3	6.3	0.12	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		0
											Subtotal	**0**
											Total	**0**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits

A-6 EPBC MNES Search Results

EPBC Act Protected Matters Report

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

Report created: 16-Jul-2024

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	110
Listed Migratory Species:	64

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	14
Commonwealth Heritage Places:	None
Listed Marine Species:	97
Whales and Other Cetaceans:	13
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	1
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	9
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	13
Key Ecological Features (Marine):	None
Biologically Important Areas:	5
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area [Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name	Buffer Status
Commonwealth Marine Areas (EPBC Act)	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

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

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area	In feature area
Dunn's white gum (Eucalyptus dunnii) moist forest in north-east New South Wales and south-east Queensland	Endangered	Community may occur within area	In buffer area only
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In feature area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Ardenna grisea Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area	In feature area
Atrichornis rufescens Rufous Scrub-bird [655]	Endangered	Species or species habitat may occur within area	In buffer area only
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat likely to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In feature area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area	In buffer area only
FISH			
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In feature area
Maccullochella ikei Clarence River Cod, Eastern Freshwater Cod [26170]	Endangered	Species or species habitat known to occur within area	In buffer area only
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area	In feature area
FROG			
Assa darlingtoni Pouched Frog [1965]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Mixophyes iteratus			
Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat known to occur within area	In feature area
Philoria sphagnicola			
Sphagnum Frog [59709]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
INSECT			
Argynnis hyperbius inconstans			
Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area	In feature area
Phyllodes imperialis smithersi			
Pink Underwing Moth [86084]	Endangered	Species or species habitat known to occur within area	In buffer area only
MAMMAL			
Balaenoptera borealis			
Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera musculus			
Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
Balaenoptera physalus			
Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Chalinolobus dwyeri			
Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Eubalaena australis			
Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Notamacropus parma](#) Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In feature area
[Petauroides volans](#) Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
[Petaurus australis australis](#) Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
[Potorous tridactylus tridactylus](#) Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Pseudomys novaehollandiae](#) New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Pteropus poliocephalus](#) Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
[Acronychia littoralis](#) Scented Acronychia [8582]	Endangered	Species or species habitat known to occur within area	In feature area
[Allocasuarina thalassoscopica](#) [21927]	Endangered	Species or species habitat known to occur within area	In buffer area only
[Arthraxon hispidus](#) Hairy-joint Grass [9338]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Boronia umbellata](#) Orara Boronia [56301]	Vulnerable	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Coleus nitidus listed as Plectranthus nitidus			
Nightcap Plectranthus, Silver Plectranthus [91380]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Corynocarpus rupestris subsp. rupestris			
Glenugie Karaka [19303]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Cryptostylis hunteriana			
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	In feature area
Cynanchum elegans			
White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Endiandra hayesii			
Rusty Rose Walnut, Velvet Laurel [13866]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus glaucina			
Slaty Red Gum [5670]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Haloragis exalata subsp. velutina			
Tall Velvet Sea-berry [16839]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Hicksbeachia pinnatifolia			
Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leichhardtia longiloba listed as Marsdenia longiloba			
Clear Milkvine [91911]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macadamia integrifolia			
Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macadamia tetraphylla			
Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Owenia cepiodora Onionwood, Bog Onion, Onion Cedar [11344]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Parsonsia dorrigoensis Milky Silkpod [64684]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area	In feature area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Samadera sp. Moonee Creek (J.King s.n. Nov. 1949) [86885]	Endangered	Species or species habitat known to occur within area	In feature area
Sarcochilus fitzgeraldii Ravine Orchid [19131]	Vulnerable	Species or species habitat known to occur within area	In feature area
Syzygium hodgkinsoniae Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat may occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area	In feature area
Vincetoxicum woollsii listed as Tylophora woollsii [40080]	Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Zieria prostrata](#) Headland Zieria [56782]	Endangered	Species or species habitat known to occur within area	In feature area
REPTILE			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Coeranoscincus reticulatus](#) Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
[Eretmochelys imbricata](#) Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Harrisoniascincus zia](#) Rainforest Cool-skink [84785]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area	In feature area
SHARK			
[Carcharias taurus (east coast population)](#) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Congregation or aggregation known to occur within area	In feature area
[Carcharodon carcharias](#) White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Galeorhinus galeus](#) School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea			
Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area	In feature area
Ardenna pacifica			
Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
Ardenna tenuirostris			
Short-tailed Shearwater [82652]		Breeding known to occur within area	In buffer area only
Calonectris leucomelas			
Streaked Shearwater [1077]		Species or species habitat may occur within area	In feature area
Diomedea antipodensis			
Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula albifrons Little Tern [82849]		Breeding known to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche cauta Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Marine Species			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area	In feature area
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In feature area
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Orcinus orca](#) Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
[Rhincodon typus](#) Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In feature area
Migratory Terrestrial Species			
[Cuculus optatus](#) Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Monarcha melanopsis](#) Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
[Myiagra cyanoleuca](#) Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
[Rhipidura rufifrons](#) Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
[Symposiachrus trivirgatus as Monarcha trivirgatus](#) Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
[Actitis hypoleucos](#) Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris canutus](#) Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
[Calidris melanotos](#) Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Gallinago megala](#) Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Gallinago stenura](#) Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Numenius minutus](#) Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Pandion haliaetus](#) Osprey [952]		Breeding known to occur within area	In feature area
[Thalasseus bergii](#) Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia			
Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

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

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [11384]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11354]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11374]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Corporation [11373]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11380]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11382]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11378]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11379]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11385]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11381]	NSW	In buffer area only
Defence		
Defence - Training Depot [10075]	NSW	In buffer area only
Defence - Training Depot [10074]	NSW	In buffer area only
Unknown		
Commonwealth Land - [11376]	NSW	In buffer area only
Commonwealth Land - [11375]	NSW	In buffer area only

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Breeding known to occur within area	In feature area
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
Ardenna tenuirostris as Puffinus tenuirostris Short-tailed Shearwater [82652]		Breeding known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Breeding likely to occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Chroicocephalus novaehollandiae as Larus novaehollandiae Silver Gull [82326]		Breeding known to occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pelagodroma marina White-faced Storm-Petrel [1016]		Breeding known to occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Pterodroma nigripennis Black-winged Petrel [1038]		Breeding known to occur within area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Stercorarius antarcticus as Catharacta skua Brown Skua [85039]		Species or species habitat may occur within area	In buffer area only
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche carteri](#) Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Thalassarche cauta](#) Shy Albatross [89224]	Endangered	Species or species habitat may occur within area	In feature area
[Thalassarche impavida](#) Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalassarche melanophris](#) Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Species or species habitat may occur within area	In feature area
[Thalasseus bergii as Sterna bergii](#) Greater Crested Tern [83000]		Breeding known to occur within area	In buffer area only
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only
Fish			
[Acentronura tentaculata](#) Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In feature area
[Campichthys tryoni](#) Tryon's Pipefish [66193]		Species or species habitat may occur within area	In feature area
[Corythoichthys amplexus](#) Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area	In feature area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area	In feature area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In feature area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area	In feature area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area	In feature area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area	In feature area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In feature area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area	In feature area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species habitat may occur within area	In feature area
Hippocampus planifrons Flat-face Seahorse [66238]		Species or species habitat may occur within area	In feature area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In feature area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In feature area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In feature area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area	In feature area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area	In feature area
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area	In feature area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area	In feature area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area	In feature area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In feature area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In feature area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Stigmatopora nigra](#) Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In feature area
[Syngnathoides biaculeatus](#) Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In feature area
[Trachyrhamphus bicoarctatus](#) Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In feature area
[Urocampus carinirostris](#) Hairy Pipefish [66282]		Species or species habitat may occur within area	In feature area
[Vanacampus margaritifer](#) Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In feature area
Mammal			
[Dugong dugon](#) Dugong [28]		Species or species habitat may occur within area	In feature area
Reptile			
[Caretta caretta](#) Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area	In feature area
[Chelonia mydas](#) Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Dermochelys coriacea](#) Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area	In feature area
[Eretmochelys imbricata](#) Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Hydrophis elegans](#) Elegant Sea Snake, Bar-bellied Sea Snake [1104]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Hydrophis platura as Pelamis platurus](#) Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area	In feature area
[Natator depressus](#) Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area	In feature area

Whales and Other Cetaceans [Resource Information]

Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
[Balaenoptera acutorostrata](#) Minke Whale [33]		Species or species habitat may occur within area	In feature area
[Balaenoptera borealis](#) Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Balaenoptera edeni](#) Bryde's Whale [35]		Species or species habitat may occur within area	In feature area
[Balaenoptera musculus](#) Blue Whale [36]	Endangered	Species or species habitat may occur within area	In feature area
[Balaenoptera physalus](#) Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Delphinus delphis](#) Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In feature area
[Eubalaena australis](#) Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In feature area
[Grampus griseus](#) Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In feature area

Current Scientific Name	Status	Type of Presence	Buffer Status
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area	In feature area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In feature area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In feature area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In feature area

Australian Marine Parks		[Resource Information]
Park Name	Zone & IUCN Categories	Buffer Status
Solitary Islands	Special Purpose Zone (Trawl) (IUCN VI)	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Bruxner Park	Flora Reserve	NSW	In buffer area only
Coffs Coast	Regional Park	NSW	In feature area
Kororo	Nature Reserve	NSW	In buffer area only
Moonee Beach	Nature Reserve	NSW	In buffer area only
Muttonbird Island	Nature Reserve	NSW	In buffer area only
Solitary Islands	Marine Park	NSW	In feature area
Split Solitary Island	Nature Reserve	NSW	In buffer area only
Ulidarra	National Park	NSW	In buffer area only
Yuraarla	Flora Reserve	NSW	In buffer area only

Regional Forest Agreements [Resource Information]

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

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

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Clarence Valley and Coffs Harbour Regional Water Supply Project	2005/2191	Controlled Action	Post-Approval	In feature area
Pacific Highway Upgrade - Coffs Harbour Bypass, NSW	2017/8005	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
25km upgrade of the Pacific Highway	2007/3910	Not Controlled Action	Completed	In buffer area only
Community Title Residential Subdivision, 22km North of Coffs Harbour	2006/2970	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Land clearing for horticulture (blueberries), South Moonee, NSW	2013/7023	Not Controlled Action	Completed	In buffer area only
Rehabilitation and Re-sculpting of Coffs Creek Flying Fox Camp and Adjacent Rese	2007/3771	Not Controlled Action	Completed	In buffer area only
Safe management of vegetation within Obstacle Limitation Surfaces, Coffs Harbour Regional Aerodrome,	2016/7794	Not Controlled Action	Completed	In buffer area only
Sawtell Catholic Care of the Aged, NSW	2020/8738	Not Controlled Action	Completed	In buffer area only
Undertake vegetation removal as per CASA safety requirements	2011/6007	Not Controlled Action	Completed	In buffer area only
Vegetation removal over sewer infrastructure easement	2013/6725	Not Controlled Action	Completed	In buffer area only
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In feature area
World Rally Championship 'Super Special Stage'	2013/6731	Referral Decision	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Referral decision				

Biologically Important Areas [Resource Information]

Scientific Name	Behaviour	Presence	Buffer Status
Dolphins			
Tursiops aduncus			
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur	In feature area
Seabirds			
Ardenna carneipes			
Flesh-footed Shearwater [82404]	Foraging	Known to occur	In buffer area only
Procellaria parkinsoni			
Black Petrel [1048]	Foraging	Likely to occur	In buffer area only
Sharks			
Carcharias taurus			
Grey Nurse Shark [64469]	Foraging	Known to occur	In feature area
Whales			
Megaptera novaeangliae			
Humpback Whale [38]	Migration (north and south)	Known to occur	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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A-8 BAM Minimum Information Requirements Checklist

Table 19: 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	**For following maps and images:** ☐ Figures 1, 2, 4, 5, 6

Report Section	BAM Ref	Information	Report Section
		☐ Landscape features identified in BAM Subsection 3.1.3 ☐ Location Map ☐ 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	☐ 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

Report Section	BAM Ref	Information	Report Section
		☐ evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.))	☐ Section 3.2.1, Table 3
		☐ plant species relied upon for identification of the PCT and relative abundance of each species	☐ Section 3.4
		☐ 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)	☐ Section 3.2
		☐ survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.)	n/a
		☐ 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)	
		☐ 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	

Report Section	BAM Ref	Information	Report Section
		☐ Plot field data (MS Excel format)	
		☐ Plot field data sheets	
		Digital shape files of:	
		☐ PCT boundaries within subject land	
		☐ 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 ☐ Table 8
		☐ list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1)	
		☐ 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**

Report Section	BAM Ref	Information	Report Section
		☐ 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	
		☐ identify the expert, provide evidence of their expert credentials and Departmental approval of expert status	N/a
		☐ all requirements of Box 3 have been addressed in the expert report	
		Where use of local data is proposed (BAM Subsection 1.4.2):	
		☐ identify relevant species	☐ Figure 10
		☐ identify data to be amended	
		☐ identify source of information for local data, e.g. published literature, additional survey data, etc.	N/a
		☐ 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)	
		☐ 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
		☐ the ecosystem credit species removed from the list	☐ Table 6
		☐ 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

Report Section	BAM Ref	Information	Report Section
		☐ 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) ☐ 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)	n/a
		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.	
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

Report Section	BAM Ref	Information	Report Section
		MAPS and TABLES (in document) ☐ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.) ☐ 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)	n/a n/a
		DATA (to be supplied) ☐ Digital shape files of prescribed impact feature locations ☐ Prescribed impact features map in jpeg format	

Table 20: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			
Assessment of Impacts	Chapter 8, Sections	**INFORMATION** ☐ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation,			**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
	8.1 and 8.2	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): ☐ 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)			

Report Section	BAM Ref	Information	Maps and Tables (in document)	Data (to be supplied)	Report Section
		☐ 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) 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.			
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)			☐ Section 6.2 and 6.3 ☐ Table 11 ☐ Table 11 ☐ Table 11

Report Section	BAM Ref	Information	Maps and Tables (in document)	Data (to be supplied)	Report Section
		☐ number of required species credits for each candidate threatened species that is directly impacted on by the proposal (BAM Subsection 10.1.3)			☐ Table 12
		MAPS and TABLES (in document) ☐ Table of PCTs requiring offset and the number of ecosystem credits required ☐ Table of threatened species requiring offset and the number of species credits required			☐ Table 11 ☐ Table 12
		DATA (to be supplied) ☐ Submitted proposal in the BAM Calculator			
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)			

Report Section	BAM Ref	Information	Maps and Tables (in document)	Data (to be supplied)	Report Section
		☐ Digital shape files of parcels of land proposed for land-based conservation measures ☐ Maps in jpeg format			