



**ECOLOGICAL ASSESSMENT**  
29 Shirley Street, Byron Bay

A Report Prepared for  
Vitale Property Group Pty Ltd

AUGUST 2022

**JWA Pty Ltd**  
Suite C, Building 21 Garden City Office Park, 2404 Logan Road, Eight Mile Plains QLD 4113  
p 07 3219 9436 • f 07 3423 2076 • e brisbane@jwaec.com.au

[www.jwaec.com.au](http://www.jwaec.com.au)

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## ABBREVIATIONS

Abbreviation	Description
BAM	Biodiversity Assessment Method
BBST	Byron Bay Solar Train
BC Act	NSW Biodiversity Conservation Act 2016
BCCCKPoM	Byron Coast Comprehensive Koala Plan of Management
BCR	Biodiversity Conservation Regulation 2017
BOS	Biodiversity Offset Scheme
BSC	Byron Shire Council
BV Map	Biodiversity Values Map
CM Act	Coastal Management Act 2016
DAWE	Department of Agriculture, Water and the Environment
DCP	Development Control Plan
DoPIE	NSW Department of Planning, Industry and Environment
DotE	Department of the Environment
EA	Ecological Assessment
EEC	Endangered Ecological Community
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2000
Ha	Hectare
JWA	JWA Pty Ltd
Km	Kilometre
LEP	Local Environmental Plan
LGA	Local Government Area
LLS Act	Local Land Services Act 2013
m	Metres
MNES	Matters of National Environmental Significance
NSW	New South Wales
NVR Map	Native Vegetation Regulatory Map
OEH	NSW Office of Environment and Heritage
PCTs	Plant Community Types
PKFT	Preferred Koala Food Tree
PKH	Preferred Koala Habitat
PMST	Protected Matters Search Tool
QLD	Queensland
SEPP	State Environmental Protection Policy
SEQ	South East Queensland
TEC	Threatened Ecological Community

# 1 INTRODUCTION

## 1.1 Background

JWA Pty Ltd have been engaged by Vitale Property Group Pty Ltd to complete an Ecological Assessment (EA) to accompany a development application for land in Byron Bay, New South Wales (NSW) and formally described as the following (the subject site):

- 29 Shirley Street: Lot 12 on DP1138310, Lot 2 on DP582819, Lot 7 on DP841611, Lot 8 Sec 52 on DP758207 and Lot 9 Sec 52 on DP758207.
- 2 Milton Street: Lot 11 on DP113831, Lot 9 on DP841611, Lot 8 on DP841611, and Lot 1 on DP780935.
- 4 Milton Street: Lot 1 on DP582819 and Lot 2 on DP582819.

This assessment has involved the following:

- Mapping and ground truthing vegetation units and determining their conservation status;
- Searching for and recording threatened and regionally significant plant species;
- Determining the suite of threatened fauna that occurs in the locality and assessing their potential occurrence on the subject site;
- Assessing habitat provided by the site in relation to adjacent habitat and making an assessment of the corridor value of the subject site;
- Addressing statutory requirements including *State Environmental Planning Policy (Biodiversity and Conservation) 2021*, *State Environmental Planning Policy (Resilience and Hazards) 2021*, *Biodiversity Conservation Act 2016* (BC Act) and the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act); and
- Assessment of the proposed development against the relevant Byron Development Control Plan (DCP) 2014 (Chapter B1 - Biodiversity and Chapter B2 - Trees and Vegetation Management) and the Byron Coast Comprehensive Koala Plan of Management (BCCCKPoM).

## 1.2 Subject site

The subject site covers an area of approximately 0.61 ha and is formally described as the following (**FIGURE 1**):

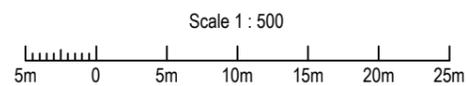
- 29 Shirley Street: Lot 12 on DP1138310, Lot 2 on DP582819, Lot 7 on DP841611, Lot 8 Sec 52 on DP758207 and Lot 9 Sec 52 on DP758207.
- 2 Milton Street: Lot 11 on DP113831, Lot 9 on DP841611, Lot 8 on DP841611, and Lot 1 on DP780935.
- 4 Milton Street: Lot 1 on DP582819 and Lot 2 on DP582819.



**LEGEND**  
 Subject Site

MILTON STREET

SHIRLEY STREET



SOURCE: MetroMap Aerial dated 07/08/2021

SCALE: 1 : 500 @ A3

JWA PTY LTD  
 Ecological Consultants

CLIENT  
 Vitale Property Group Pty Ltd  
 PROJECT  
 Ecological Assessment  
 29 Shirley Street & 2-4 Milton Street,  
 Byron Bay NSW  
 Byron Shire Council LGA

FIGURE 1

PREPARED: BW  
 DATE: 20 July 2022  
 FILE: N22004\_EA\_20220720.dwg

TITLE

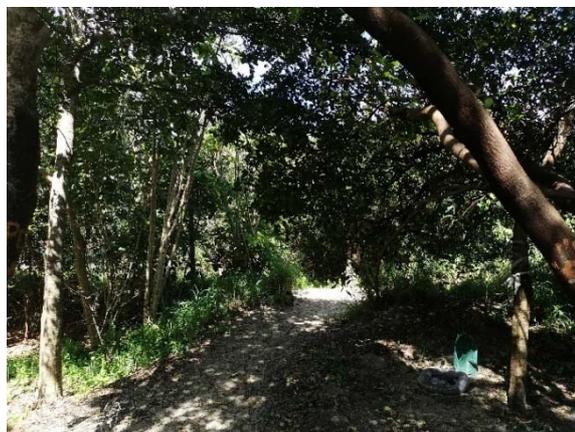
AERIAL  
 PHOTOGRAPH

The subject site is located less than 1 km from the Byron Bay central business district, and is bound by urban development to the east, south and west. To the north of the subject site is the Byron Bay Solar Train (BBST) rail corridor (approximately 20 m wide) (**PHOTO PLATE 1**), and narrow strip of native / coastal vegetation (approximately 70 m wide) that connects to the beach (**PHOTO PLATE 2**).

Most of the subject site is developed and used as private residence or backpacker's accommodation. With the exception of some scattered landscape trees (i.e. palms), these areas are void of vegetation. The back third of the backpackers contains scattered vegetation, maintained lawns and a beach volleyball court (**PHOTO PLATES 3 & 4**). Apart from one (1) isolated tuckeroo (*Cupaniopsis anarcardiodes*) on the western boundary of 4 Milton Street, the back third of the backpackers contains the most likely (and arguably 'only') ecological features on the subject site (where relevant referred to as the 'focal area'). A recent aerial photograph showing the subject site is provided in **FIGURE 1**.



**PHOTO PLATE 1**  
BYRON BAY SOLAR TRAIN RAIL CORRIDOR AT THE REAR OF THE SUBJECT SITE (PHOTO CREDIT: MELANIE JACKSON - BUSHFIRE RISK PTY LTD).



**PHOTO PLATE 2**  
COASTAL VEGETATION BETWEEN THE SUBJECT SITE AND THE BEACH (PHOTO CREDIT: MELANIE JACKSON - BUSHFIRE RISK PTY LTD).



**PHOTO PLATE 3**  
CONTEXT OF THE FOCAL AREA SHOWING MAINTAINED LAWNS AND VOLLEYBALL COURT WITH SCATTERED TREES.



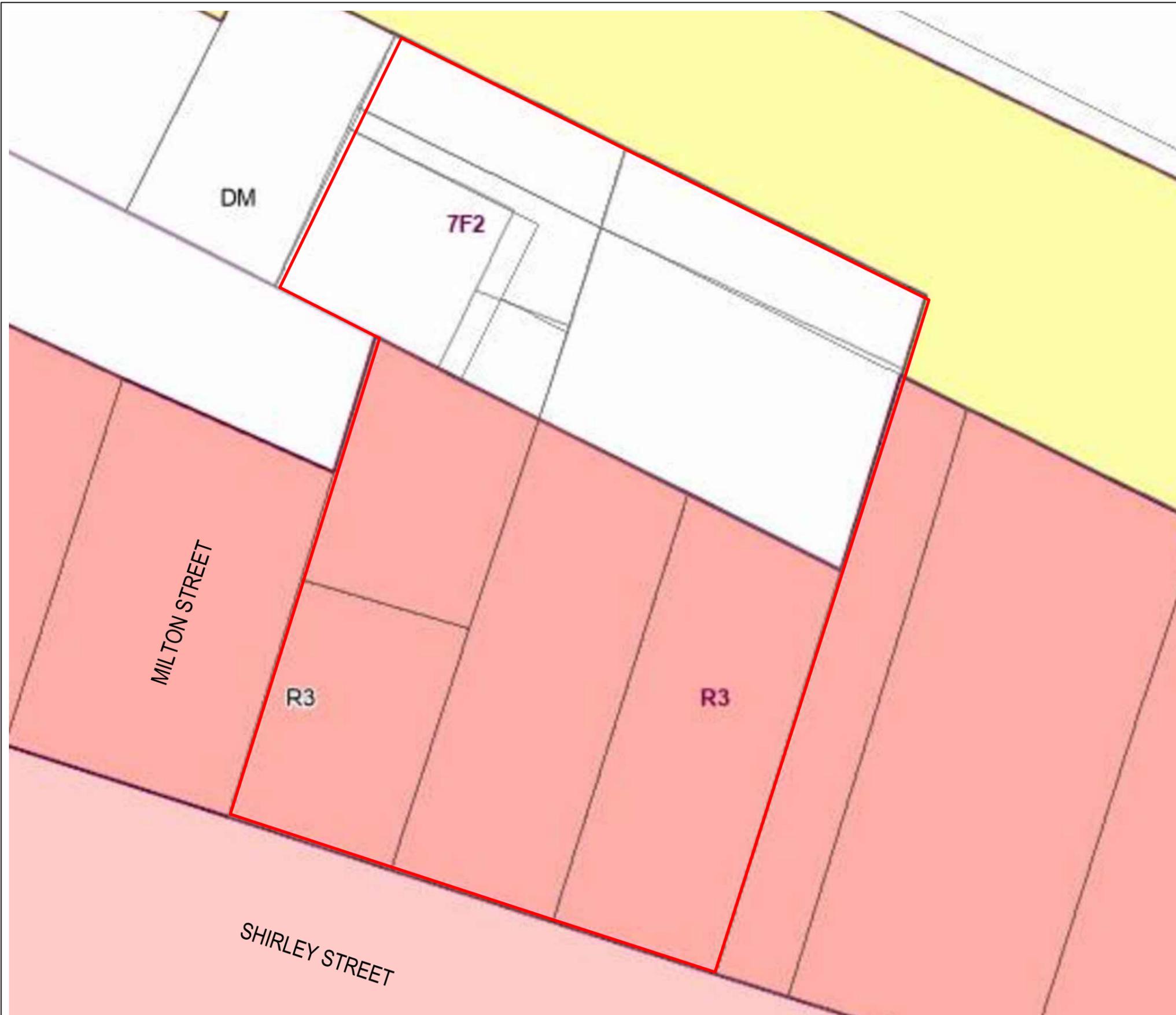
**PHOTO PLATE 4.**  
CONTEXT OF THE FOCAL AREA SHOWING MAINTAINED LAWNS AND VOLLEYBALL COURT WITH SCATTERED TREES.

### **1.3 Land use zones**

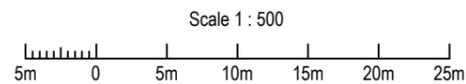
The Byron Local Environmental Plan (LEP) 2014 is the primary planning tool for the Byron Shire Council (BSC) and includes several mapping layers. The land is zoned as R3 Medium Density Residential and Deferred Matter under the Byron Local Environmental Plan (BLEP) 2014. The Deferred Matter is zoned 7(f2) Urban Coastal Lands Zone under the BLEP 1988 (**FIGURE 2**).

### **1.4 The proposed development**

The proposed development comprises a multiple dwelling twenty-six (26) unit development plus associated supporting infrastructure. A layout plan of the proposed development is provided in **APPENDIX 1**.



- LEGEND**
- Subject Site
  - Byron LEP 2014 - Zoning Plan**
  - R3 - Medium Density Residential
  - R2 - Low Density Residential
  - SP2 - Infrastructure
  - DM - Deferred Matter
  - Byron LEP 1988 - Zoning Plan**
  - 7F2 - Urban Coastal Lands



SOURCE: Byron Shire Council Online Maps  
Byron LEP 2014 Layers (accessed 31/03/22)

SCALE: 1 : 500 @ A3

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Ecological Assessment  
29 Shirley Street & 2-4 Milton Street,  
Byron Bay NSW  
Byron Shire Council LGA

**FIGURE 2**

PREPARED: BW  
DATE: 20 July 2022  
FILE: N22004\_EA\_20220720.dwg

TITLE

**ZONING  
PLAN**

## 2 DESKTOP ASSESSMENT

### 2.1 Introduction

A desktop assessment included a review of the following to highlight any potential conservation significant vegetation communities, any potential habitat for threatened flora and fauna, and any ecologically sensitive areas on the subject site:

- State and Commonwealth databases;
- Commonwealth legislation;
- New South Wales (NSW) plans, policies and legislation;
- BSC plans and policies; and
- Scientific journal articles and botanical literature to assist with habitat suitability assessments.

### 2.2 Methods

#### 2.2.1 *Commonwealth database searches*

The Protected Matters Search Tool (PMST) was used to generate a list of the following Matters of National Environmental Significance (MNES) protected under the EPBC Act that may occur within 10 km of the subject site:

- world heritage and national heritage areas;
- wetlands of international significance (Ramsar Wetlands);
- Commonwealth marine areas;
- threatened ecological communities;
- threatened species; and
- migratory species.

The PMST database incorporates information from a range of sources, including government agencies, research, and community organisations. It should be noted that there are limitations on the accuracy of some matters reported by the PMST. Database records of threatened and migratory species are based on their current known distribution and do not necessarily correlate to an actual observation. As a result, these records are an indicator of potential presence only and do not consider if suitable vegetation, geology, soil, climate, or habitat types are present to support the occurrence of a species or community.

#### 2.2.2 *State database searches*

The NSW Department of Planning, Industry and Environment (DoPIE) BioNet online database is based on collated biodiversity data acquired by the NSW Government through a range of sources including specimen collections, research and monitoring programs, and community wildlife groups. A BioNet database search was used to generate a list of threatened flora and fauna species listed under the BC Act that may occur within 10 km of the subject site.

### **2.2.3 State government legislation and mapping**

#### 2.2.3.1 Background

The following environmental legislation and mapping was reviewed as part of the desktop assessment:

- *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP);
- *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP);
- Biodiversity Values Map (BV Map); and
- Native Vegetation Regulatory Map (NVR Map).

#### 2.2.3.2 Resilience and Hazards SEPP

The Resilience and Hazards SEPP came into effect on the 1<sup>st</sup> March 2022. Chapter 2 - Coastal Management of the Resilience and Hazards SEPP contains planning provisions for land use planning within the coastal zone consistent with the Coastal Management Act 2016. Chapter 2 - Coastal Management gives effect to the objectives of the Coastal Management Act 2016 from a land use planning perspective, by specifying how development proposals are to be assessed if they fall within the coastal zone.

Part 2.1, Clause 2.4 of Chapter 2 - Coastal Management defines the following four (4) coastal management areas through detailed mapping and specifies assessment criteria that are tailored for each coastal management area:

- Coastal wetlands and littoral rainforests area - defined as areas with particular hydrological and ecological characteristics;
- Coastal vulnerability area - defined as the area affected by any one of seven coastal hazards;
- Coastal environment area - defined as the coastal waters of the state/ estuaries/ coastal lakes and foreshores including beaches/ dunes/ headlands and rock platforms as well as surrounding land; and
- Coastal use area - defined as land adjacent to the coast/ where development is or may be carried out.

Councils and other consent authorities must apply these criteria when assessing proposals for development that fall within one or more of the mapped areas.

#### 2.2.3.3 Biodiversity and Conservation SEPP

The Biodiversity and Conservation SEPP commenced on 1st March 2022. For the purposes of this EA, the following three (3) chapters in the Biodiversity and Conservation SEPP are relevant:

- 'Chapter 2 - Vegetation in non-rural areas' contains planning rules and controls relating to the clearing of native vegetation in NSW on land zoned for urban and environmental purposes that is not linked to a development application. The policy works together with the *Biodiversity Conservation Act 2016* and the *Local Land Services Amendment Act 2016* to create a framework for the regulation of clearing of native vegetation in NSW. It aims to ensure the biodiversity offset scheme (established under the Land Management and Biodiversity reforms) will apply to all clearing of native vegetation that exceeds the offset thresholds in urban areas and environmental conservation zones that does not require development consent.
- 'Chapter 3 - Koala habitat protection 2020' contains land-use planning and assessment framework for koala habitat with the rural zones of RU1, RU2 and RU3, except within the Greater Sydney and Central Coast areas.
- 'Chapter 4 - Koala habitat protection 2021' contains the land-use planning and assessment framework for koala habitat within Metropolitan Sydney and the Central Coast and applies to all zones except RU1, RU2 and RU3 in the short term.

#### 2.2.3.4 Biodiversity Values Map (BV Map)

The BV Map identifies land with high biodiversity value, as defined by clause 7.3(3) of the *Biodiversity Conservation Regulation 2017* (BCR). The Biodiversity Offsets Scheme (BOS) applies to all clearing of native vegetation and other biodiversity impacts prescribed by clause 6.1 of the BCR (i.e. all local developments, major projects or the clearing of native vegetation where the Biodiversity and Conservation SEPP applies) on land identified on the BVM.

#### 2.2.3.5 Native Vegetation Regulatory Map (NVR Map)

The NVR Map was prepared by the NSW Office of Environment and Heritage (OEH) under Part 5A of the amended *Local Land Services Act* (LLS Act) and supporting regulation. The NVR Map is a tool to give landholders certainty when planning future management of their land. The NVR Map generally covers rural land in NSW. It categorises land where management of native vegetation can occur without approval or where management of native vegetation may be carried out in accordance with Part 5A of the LLS Act.

### **2.2.4 *Local government plans and mapping***

The Byron LEP (2014) became effective on 21<sup>st</sup> July 2014 (current version 22 December 2021). Relevant environment constraints are mapped for the Byron LEP under the NSW planning portal and NVR Map. The following relevant environmental mapping was reviewed as part of the EA:

- Areas of High Environmental Value (2017);
- Big Scrub Rainforest Remnants (2016);
- Flying Fox Camp Locations;
- National Parks; and
- Vegetation Communities (2021).

The Byron Coast Comprehensive Koala Plan of Management (BCCKPoM) was adopted by BSC in August 2016 on the back of a Byron Coast Koala Habitat Study prepared in 2012 (Biolink 2012). In accordance with the objectives of the Koala SEPP 2021 (now part of the Biodiversity and Conservation SEPP) and the approved NSW Koala Recovery Plan, the overarching vision of the BCCKPoM is that the Byron Coast koala population will be recovered to more sustainable levels over the next two decades. The BCCKPoM was reviewed as part of the desktop assessment and discussed in further detail in **SECTION 6.6**.

The purpose of the BSC DCP 2010 (DCP 2010) and DCP 2014 (DCP 2014) are to specify Council's requirements for quality development and sustainable environmental outcomes on land in the Shire. DCP 2010 applies to land to which the Byron LEP 1988 (LEP 1988) applies i.e. all land deferred from LEP 2014, with the exception of the West Byron urban release area (where DCP 2014 applies). DCP 2014 applies to land to which the Byron LEP 2014 applies.

## 2.3 Results

### 2.3.1 Database Searches

#### 2.3.1.1 Threatened ecological communities (TECs)

Database searches using the Commonwealth PMST (completed on the 19<sup>th</sup> July 2022) revealed that five (5) TECs may occur within 10 km of the subject site:

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland (SEQ) ecological community (Endangered);
- Coastal Swamp Sclerophyll Forest of New South Wales and SEQ (Endangered);
- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia (Critically Endangered);
- Lowland Rainforest of Subtropical Australia (Critically Endangered); and
- Subtropical and Temperate Coastal Saltmarsh (Vulnerable).

#### 2.3.1.2 Threatened flora species

Threatened flora species detected in the database searches (completed on the 19<sup>th</sup> July 2022) are listed in **TABLE 1**. The conservation status of each species listed in **TABLE 1** is shown in accordance with the EPBC Act and BC Act.

**TABLE 1**  
**RECORDS OF THE THREATENED FLORA SPECIES WITHIN 10 KM OF THE SITE**

Botanical name	Common name	BC Act	EPBC Act
<i>Acronychia littoralis</i>	Scented acronychia	E	E
<i>Allocasuarina defungens</i>	Dwarf heath casuarina	E	
<i>Allocasuarina thalassoscopica</i>			E
<i>Archidendron hendersonii</i>	White lace flower	V	
<i>Arthraxon hispidus</i>	Hairy-joint grass	V	V
<i>Baloghia marmorata</i>	Marbled balogia	(V)	V

Botanical name	Common name	BC Act	EPBC Act
<i>Bosistoa transversa</i>	Three-leaved bosistoa	(V)	V
<i>Bulbophyllum globuliforme</i>	Miniature moss-orchid	(V)	V
<i>Caesalpinia bonduc</i>	Knicker nut	E	
<i>Chamaesyce psammogeton</i>	Sand spurge	E	
<i>Corokia whiteana</i>		(V)	V
<i>Cryptocarya foetida</i>	Stinking cryptocarya	V	V
<i>Cryptostulis hunteriana</i>	Leafless tongue orchid	(V)	V
<i>Cynanchum elegans</i>	White-flowered wax plant	(E)	E
<i>Davidsonia jerseyana</i>	Davidson's plum	E	E
<i>Davidsonia johnsonii</i>	Smooth Davidson's plum	(E)	E
<i>Desmodium acanthocladum</i>	Thorny pea	V	V
<i>Diploglottis campbellii</i>	Small-leaved tamarind	(E)	E
<i>Diuris byronensis</i>	Byron Bay diuris	E	
<i>Drynaria rigidula</i>	Basket fern	E	
<i>Elaeocarpus williamsianus</i>	Hairy quandong	(E)	E
<i>Endiandra floydii</i>	Crystal creek walnut	E	E
<i>Endiandra hayesii</i>	Rusty rose walnut	V	V
<i>Endiandra muelleri subsp. bracteata</i>	Green-leaved rose walnut	E	
<i>Floydia praealta</i>	Ball nut	V	V
<i>Fontainea australis</i>	Southern fontainea	(V)	V
<i>Geodorum densiflorum</i>	Pink nodding orchid	E	
<i>Gossia fragrantissima</i>	Sweet myrtle	(E)	E
<i>Grevillea hilliana</i>	White yiel yiel	E	
<i>Hicksbeachia pinnatifolia</i>	Monkey nut	(V)	V
<i>Isoglossa eranthemoides</i>	Isoglossa	(E)	E
<i>Macadamia integrifolia</i>	Macadamia nut		V
<i>Macadamia tetraphylla</i>	Rough-shelled bush nut	V	V
<i>Marsdenia longiloba</i>	Slender marsdenia	E	V
<i>Melicope vitiflora</i>	Coast euodia	E	
<i>Oberonia complanata</i>	Yellow-flowered king of the fairies	E	
<i>Ochrosia moorei</i>	Southern ochrosia	(E)	E
<i>Owenia cepiodora</i>	Onion cedar	V	V
<i>Phaius australis</i>	Lesser swamp-orchid	E	E
<i>Psilotum complanatum</i>	Flat fork fern	E	
<i>Pterostylis nigricans</i>	Dark greenhood	V	
<i>Randia moorei</i>	Spiny gardenia	(E)	E
<i>Rhodamnia rubescens</i>	Scrub turpentine	CE	CE
<i>Rhodomyrtus psidioides</i>	Native guava	CE	CE
<i>Sophora fraseri</i>		(V)	V
<i>Symplocos baeuerlenii</i>	Small-leaved hazelwood	(V)	V
<i>Syzygium hodgkinsoniae</i>	Red lilly pillly	V	V
<i>Syzygium moorei</i>	Durobby	V	V
<i>Thesium australe</i>	Australian toadflax	(V)	V
<i>Tinospora tinosporoides</i>	Arrow-head vine	V	
<i>Tylophora woollsii</i>		(E)	E
<i>Xylosma terrae-reginae</i>	Queensland xylosma	E	

BC Act - New South Wales *Biodiversity Conservation Act 2016*

EPBC Act - Commonwealth *Environment Protection Biodiversity and Conservation Act 1999*

Botanical name	Common name	BC Act	EPBC Act
Conservation status: CE - Critically endangered; E - Endangered; V - Vulnerable; NT - Near threatened ( ) listed but not identified in database search for the subject site.			

### 2.3.1.3 Threatened fauna species

Threatened fauna species detected in the database searches (completed on the 19<sup>th</sup> July 2022) are listed in **TABLE 2**. The conservation status of each species listed in **TABLE 2** is shown in accordance with the EPBC Act and BC Act. Species that will clearly not occur on the subject site (i.e. whales, dolphins, sharks, marine turtles) have been omitted.

**TABLE 2**  
**RECORDS OF THREATENED FAUNA SPECIES WITHIN 10 KM OF THE SITE**

Scientific name	Common name	BC Act	EPBC Act
<b>Amphibians</b>			
<i>Crinia tinnula</i>	Wallum froglet	V	
<i>Litoria aurea</i>	Green and golden bell frog	E	
<i>Litoria olongburensis</i>	Wallum sedge frog	V	V
<i>Mixophyes fleayi</i>	Fleay's frog	(E)	E
<i>Mixophyes iteratus</i>	Giant barred frog	(E)	V
<b>Birds</b>			
<i>Amaurornis moluccana</i>	Pale-vented bush-hen	V	
<i>Anthochaera phrygia</i>	Regent honeyeater	(CE)	CE
<i>Botaurus poiciloptilus</i>	Australasian bittern	E	E
<i>Burhinus grallarius</i>	Bush stone-curlew	E	
<i>Calidris canutus</i>	Red knot		E
<i>Calidris ferruginea</i>	Curlew sandpiper	E	CE
<i>Calidris tenuirostris</i>	Great knot	V	CE
<i>Calyptorhynchus lathamii</i>	Glossy black-cockatoo	V	
<i>Carterornis leucotis</i>	White-eared monarch	V	
<i>Cyclopsitta diophthalma coxeni</i>	Coxen's fig-parrot	CE	E
<i>Ephippiorhynchus asiaticus</i>	Black-necked stork	E	
<i>Erythrotriorchis radiatus</i>	Red goshawk	(CE)	V
<i>Falco hypoleucos</i>	Grey falcon	(E)	V
<i>Glossopsitta pusilla</i>	Little lorikeet	V	
<i>Grus rubicunda</i>	Brolga	V	
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle	V	
<i>Hieraaetus morphnoides</i>	Little eagle	V	
<i>Hirundapus caudacutus</i>	White-throated needletail		V
<i>Irediparra gallinacea</i>	Comb-crested jacana	V	
<i>Ixobrychus flavicollis</i>	Black bittern	V	
<i>Lathamus discolor</i>	Swift parrot	(E)	CE
<i>Limosa lapponica baueri</i>	Nunivak bar-tailed godwit		V
<i>Lophoictinia isura</i>	Square-tailed kite	V	
<i>Numenius madagascariensis</i>	Eastern curlew		CE
<i>Pandion cristatus</i>	Eastern osprey	V	
<i>Podargus ocellatus</i>	Marbled frogmouth	V	
<i>Ptilinopus magnificus</i>	Wompoo fruit-dove	V	

Scientific name	Common name	BC Act	EPBC Act
<i>Ptilinopus regina</i>	Rose-crowned fruit-dove	V	
<i>Ptilinopus superbus</i>	Superb fruit-dove	V	
<i>Rostratula australis</i>	Australian painted snipe	(E)	E
<i>Tyto longimembris</i>	Eastern grass owl	V	
<i>Tyto novaehollandiae</i>	Masked owl	V	
<i>Tyto tenebricosa</i>	Sooty owl	V	
<b>Invertebrates</b>			
<i>Argynnis hyperbius inconstans</i>	Australian fritillary	E	CE
<i>Phyllodes imperialis smithersi</i>	Southern pink underwing moth	E	(E)
<i>Thersites mitchellae</i>	Mitchell's rainforest snail	E	CE
<b>Mammals</b>			
<i>Chalinolobus dwyeri</i>	Large-eared pied bat	(V)	V
<i>Dasyurus maculatus</i>	Spotted-tailed quoll	V	E
<i>Miniopterus australis</i>	Little bent-winged bat	V	
<i>Miniopterus orianae oceanensis</i>	Large bent-winged bat	V	
<i>Myotis macropus</i>	Southern myotis	V	
<i>Nyctophilus bifax</i>	Eastern long-eared bat	V	
<i>Petaurus australis</i>	Yellow-bellied glider	(V)	V
<i>Phascolarctos cinereus</i>	Koala	V	E
<i>Planigale maculata</i>	Common planigale	V	
<i>Potorous tridactylus tridactylus</i>	Long-nosed potoroo	V	V
<i>Pseudomys gracilicaudatus</i>	Eastern chestnut mouse	V	
<i>Pseudomys novaehollandiae</i>	New Holland mouse		V
<i>Pteropus poliocephalus</i>	Grey-headed flying-fox	V	V
<i>Saccolaimus flaviventris</i>	Yellow-bellied sheath-tail-bat	V	
<i>Scoteanax rueppellii</i>	Greater broad-nosed bat	V	
<i>Syconycteris australis</i>	Common blossom-bat	V	
<i>Xeromys myoides</i>	Water mouse		V
<b>Reptiles</b>			
<i>Coeranoscincus reticulatus</i>	Three-toed snake-tooth skink		V
<i>Delma torquata</i>	Collared delma		V
BC Act - NSW <i>Biodiversity Conservation Act 2016</i> (BC Act)			
EPBC Act - Commonwealth <i>Environment Protection Biodiversity and Conservation Act 1999</i>			
Conservation status: CE - Critically endangered; E - Endangered; V - Vulnerable; NT - Near threatened			
() listed but not identified in database search for the subject site.			

#### 2.3.1.4 Migratory species

Database searches using the Commonwealth PMST also revealed that eighteen (18) migratory terrestrial species (i.e. excluding marine species) may occur within 10 km of the subject site based on the availability of suitable habitat. Migratory species identified in database searches are listed in **TABLE 3**.

**TABLE 3**  
**RECORDS OF COMMONWEALTH LISTED MIGRATORY SPECIES WITHIN 10KM OF THE SITE**

Scientific name	Common name	Status <sup>#</sup>
<i>Actitis hypoleucos</i>	Common sandpiper	M
<i>Apus pacificus</i>	Fork-tailed Swift	M
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	M
<i>Calidris canutus</i>	Red knot	M, E
<i>Calidris ferruginea</i>	Curlew sandpiper	M, CE
<i>Calidris melanotos</i>	Pectoral sandpiper	M
<i>Cuculus optatus</i>	Oriental cuckoo	M
<i>Gallinago hardwickii</i>	Latham's snipe	M
<i>Hirundapus caudacutus</i>	White-throated needletail	M, V
<i>Limosa lapponica</i>	Bar-tailed godwit	M
<i>Monarcha melanopsis</i>	Black-faced monarch	M
<i>Monarcha trivirgatus</i>	Spectacled monarch	M
<i>Motacilla flava</i>	Yellow wagtail	M
<i>Myiagra cyanoleuca</i>	Satin flycatcher	M
<i>Numenius madagascariensis</i>	Eastern curlew	M, CE
<i>Pandion haliaetus</i>	Osprey	M
<i>Rhipidura rufifrons</i>	Rufous fantail	M
<i>Tringa nebularia</i>	Common greenshank	M
# Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) CE - Critically Endangered, E - Endangered, V - Vulnerable. M - Migratory		

### 2.3.2 State government legislation and mapping

#### 2.3.2.1 Resilience and Hazard SEPP

The entire subject site is mapped as coastal use area.

#### 2.3.2.2 Biodiversity and Conservation SEPP

The approved BCCKPoM applies to the subject site. As a result, 'Chapter 4 - Koala habitat protection 2021' of the Biodiversity and Conservation SEPP applies and is further discussed in **SECTION 6.5**.

#### 2.3.2.3 Biodiversity Values Map (BV Map)

The subject site is not mapped on the BV Map.

#### 2.3.2.4 Native Vegetation Regulatory Map (NVR Map)

As the subject site is not mapped within the rural zone the NVR Map does not apply.

### 2.3.3 Local government plans and mapping

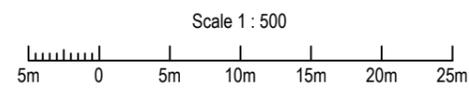
BSC mapping identifies parts of Lot 12 / DP1138310 and the east of Lot 7 / DP841611 as containing Areas of High Environmental Value (HEV). More specifically, these areas are mapped as being representative of a littoral rainforest (**FIGURE 3**), which is listed as *endangered* under the BC Act and *critically endangered* under the EPBC Act.



**LEGEND**  
 [Red Outline] Subject Site  
 [Green Fill] Byron Vegetation Mapping 2021  
 [Green Fill] Littoral Rainforests

MILTON STREET

SHIRLEY STREET



SOURCE: Byron Shire Council Online Maps  
 Environmental Layers (accessed 31/03/22)

SCALE: 1 : 500 @ A3

JWA PTY LTD  
 Ecological Consultants

CLIENT  
 Vitale Property Group Pty Ltd  
 PROJECT  
 Ecological Assessment  
 29 Shirley Street & 2-4 Milton Street,  
 Byron Bay NSW  
 Byron Shire Council LGA

FIGURE 3

PREPARED: BW  
 DATE: 20 July 2022  
 FILE: N22004\_EA\_20220720.dwg

TITLE  
 BYRON  
 VEGETATION  
 MAPPING 2021

It should be noted that areas of HEV are also mapped over Lot 11 / DP1138310, Lot 9 / DP 841611, Lot 1 / DP780935, and Lot 8 / DP41611. These areas are now entirely void of vegetation due to past / recent clearing and residential development.

TECs are identified as 'red flags' under the BSC DCP. As a result, Chapter B1 - Biodiversity of the DCP warrants investigation for the subject site. Given that the proposal includes development either now or in the future, Chapter B2 - Trees and Vegetation Management of the DCP does not apply.

Under the BCCKPoM the subject site is included in the koala planning area and is mapped as part of the South Byron Coast Koala Management Area (KMA). Despite this, the subject site is **not** mapped as being part of a Koala Management Precinct (KMP) or containing potential koala habitat.

## 3 SITE ASSESSMENT

### 3.1 Introduction

A site assessment was completed by one (1) senior ecologist on 23<sup>rd</sup> March 2022. The subject site was traversed on foot and a general plant species list was compiled and mapping of vegetation communities was completed with the aid of a recent aerial photograph. Photographs were taken to illustrate the condition and status of the focal area and subject site in general.

### 3.2 Vegetation description

The focal area is predominately cleared with maintained lawns and recreational facilities (**PHOTO PLATE 3 & 4**). Apart from some palms and fruit trees, scattered vegetation present in the focal area includes (\* = exotic species; \*\* = native but not endemic) (**PHOTO PLATES 5-8**) (refer **APPENDIX 2** for tree locations):

1. Small leaf fig (*Ficus obliqua*);
2. Coconut palm (*Cocos nucifera*)\*;
3. Bloodwood (*Corymbia intermedia*);
4. Tuckeroo (*Cupaniopsis anacardioides*);
5. Group of Bloodwoods (x5)
6. Pandanus (*Pandanus tectorius*);
7. Tuckeroo
8. Paperbark (*Melaleuca quinquenervia*);
9. Firewheel (*Stenocarpus sinuatus*);
10. Ivory curl tree (*Buckinghamia celsissima*)\*\*;
11. Lilli Pilli (*Syzygium luehmannii*);
12. Cook Island pine (*Araucaria columnaris*)\*;
13. Paperbark
14. Guioa (*Guioa semiglauca*);
15. Bloodwood; and
16. Tuckeroo (located outside of the focal area but within the subject site)

No threatened flora was recorded on the subject site; however, four (4) species (including six individual trees) underlined above indicated the community's potential as a littoral rainforest TEC.

It should be noted that several trees, including two (2) rainforest species (i.e. lilli pilli and guioa) were confirmed by the property owner as being planted within the past 15 years.



**PLATE 5**  
**BEACH VOLLEYBALL COURT WITH  
SCATTERED TREES (PHOTO CREDIT: MELANIE  
JACKSON - BUSHFIRE RISK PTY LTD).**



**PLATE 6**  
**SCATTERED TREES AND MAINTAINED LAWNS.**



**PLATE 7**  
**SCATTERED TREES AND MAINTAINED LAWNS.**



**PLATE 8**  
**SCATTERED TREES AND MAINTAINED LAWNS  
AND ACCESS PATH.**

### 3.3 Opportunistic fauna records

The following fauna species were recorded opportunistically on the subject site during the site assessment:

- Carpet python (*Morelia spilota*) (PHOTO PLATE 9);
- Masked lapwing (*Vanellus miles*) (PHOTO PLATE 10);
- Little wattle bird (*Anthochaera chrysoptera*);
- Rainbow lorikeet (*Trichoglossus haematodus*); and
- Australia magpie (*Gymnorhina tibicen*).

It should be noted that a masked lapwing nest and eggs was recorded on the fringe of the volleyball court (PHOTO PLATE 10). Regular breeding (at least annually) in the focal area was confirmed by the property owner.



**PHOTO PLATE 9**  
**CARPPET PYTHON (*MORELIA SPILOTA*)**  
**RECORDED IN THE FOCAL AREA.**



**PHOTO PLATE 10**  
**MASKED LAPWING (*VANELLUS MILES*)**  
**BREEDING IN THE FOCAL AREA. INDIVIDUAL**  
**CAN BE SEEN WITTING ON A NEST AND EGGS**  
**ON THE EDGE OF THE VOLLEYBALL COURT.**

## 4 HABITAT SUITABILITY ASSESSMENT

### 4.1 Background

The suitability of the habitats for listed threatened flora and fauna species identified in database searches was assessed to determine which species could potentially occur in the impact area and on the subject site.

The impacts associated with current land uses, vegetation clearing, land, and waterway erosion/degradation, weed and feral invasion and previous fire regimes were all considered when completing habitat suitability assessments. Particular attention was paid to habitat features such as:

- mature trees with hollows, fissures and/or other suitable roosting/nesting places;
- PKFTs and/or glossy black cockatoo feed trees (forest oak and/or black she-oak);
- the presence of characteristic signs of foraging (e.g. chewed cones or glider feeding scars);
- condition, flow and water quality of drainage lines and bodies of water;
- areas of dense vegetation;
- hollow logs/debris and areas of dense leaf litter;
- fruiting and/or blossoming flora species;
- connectivity and proximity to neighbouring areas of intact vegetation; and
- caves and man-made structures suitable as microchiropteran bat roost sites.

Potential occurrences of threatened fauna species and migratory species are discussed as *unlikely*, *possible*, or *likely* to occur in habitats on the subject site. Possible occurrences are species which may occur sporadically or are provided with small areas of potentially suitable habitat. Likely occurrences are provided with habitat of high quality.

### 4.2 Applicability to the subject site

No threatened species was recorded on the subject site.

Due to the presence of a small number of flowering native trees (i.e. *Corymbia* sp., *Melaleuca* sp.) across the subject site, the very occasional presence of the threatened grey-headed flying-fox cannot be confidentially ruled out. Notwithstanding this, these resources are commonly available across the broader locality and the grey-headed flying-fox can cover vast distances while foraging.

Given its coastal location it is likely that threatened flora and/or fauna species are present within proximity and/or traverse the subject site aerially from time to time. Despite this, the subject sites developed and disturbed nature means that it is highly unlikely that the proposed development will have an impact on the habitat of any of the threatened species listed in **TABLES 1-3**.

## 5 IMPACTS AND AMELIORATION

### 5.1 Impacts of the proposed development

#### 5.1.1 *Native vegetation*

Based on data collected during the site assessment and those provided by Northern Tree Care (2021) and Bushfire Risk Pty Ltd (**APPENDIX 2**), at least 16 native and endemic trees will require removal for the proposed development. Of these, five (5) are identified as characteristic species for the EPBC Act TEC *Littoral Rainforest and Coastal Vine Thickets of Eastern Australia* and/or BC Act EEC *Littoral rainforest in the NSW North Coast, Sydney Basin and South-East Corner bioregions*.

Detailed assessment of this potential TEC / EEC is provided in **SECTION 6.2.5**, **SECTION 6.3.3**, and **APPENDIX 3**.

In addition to vegetation removal, indirect impacts on vegetation communities and plants may include:

- Clearance of areas on the site represents a minor loss of habitat available for dispersal for plants and will reduce visits by pollination and dispersal vectors.
- Disturbance to the site creates opportunities for weeds to colonise. Weeds may be introduced during construction works in materials or by vehicles. Subsequent occupation of the site also creates opportunities for weeds to become established. Landscape species may escape to retained areas of vegetation.
- The removal of vegetation from the site represents the loss of organic material from the site.

#### 5.1.2 *Threatened flora*

No threatened flora was recorded on the subject site.

#### 5.1.3 *Fauna*

The proposed development will result in some very minor loss of foraging and sheltering habitat for common and urban adapted native fauna occurring in the locality. This loss may have the following impacts:

- Minor loss of forage habitat for nectarivorous and insectivorous fauna species.
- Minor increase in the fragmentation of habitat in the locality.
- Minor loss of sheltering and breeding habitat for native fauna.
- Animals may be killed or injured during the clearance of vegetation.

#### 5.1.4 *Threatened fauna*

No threatened fauna species were recorded from the subject site. No impacts are considered likely for these species further than those described in **SECTION 5.1.3**.

## 5.2 Amelioration

### 5.2.1 Introduction

This section discusses possible ameliorative measures and opportunities for enhancing the natural environment on the subject site i.e. plant communities, fauna communities, and threatened species.

### 5.2.2 Amelioration for native vegetation

It is recommended that a Vegetation Management Plan (VMP) be prepared for the proposed development. The VMP should provide guidelines for controlling activities during the pre-clearing and clearing phases of the development and detail how the retained small leaf fig (tree #1) should be clearly marked and protected (see **APPENDIX 2** for relevant location)

Other amelioration measures include:

- Weeds should be controlled during construction.
- Vegetation removed during construction should be mulched for use on the subject site. This will prevent the introduction of weeds from seeds in mulch brought in from elsewhere.
- Weeds should be controlled in landscaped areas and areas of retained vegetation.
- Known environmental weeds should be avoided in landscaping.
- For the trees being retained on the subject site tree protection measures should be used in accordance with recommendations provided by a suitable qualified arborist.

### 5.2.3 Amelioration for threatened flora

No threatened flora will be impacted by the proposed development.

### 5.2.4 Amelioration for fauna

Vegetation clearing for the proposed development will result in some minor loss of habitat for fauna. Given the extent of this habitat is minor, and no significant ecological features were recorded (i.e. tree hollows, nests\* etc.), the following amelioration would be considered sufficient for vegetation clearing works:

- A suitably qualified ecologist who holds a fauna survey licence is required to manage wildlife onsite during any tree removal and/or disturbance to wildlife habitat. Where translocation is required, the proponent shall seek any relevant permits from the state regulating agency. It is the responsibility of the proponent to ensure all relevant licences have been obtained prior to any fauna interactions.

**\*Note:** this does not include the masked lapwing nest that is currently present on the ground; however, appropriate measures listed above should apply in this case.

Recommended additional amelioration measures for fauna include the following:

- Appropriate disposal of rubbish and food scraps reduces opportunities for non-native predators and disturbance adapted competitors.
- Landscape and landfill materials should be sourced from a supplier where Cane toads do not occur.
- Landscape plantings should include native species that will provide forage habitat for nectarivorous and frugivorous birds and bats.

## 6 STATUTORY CONSIDERATIONS

### 6.1 Introduction

This section includes an assessment of the likely impacts of the proposed development with regards to relevant Commonwealth, State and Local legislation.

Amelioration measures recommended to minimise and mitigate any impacts on the biodiversity and habitat values of the subject site and impact area have also been detailed where applicable. Detailed assessment of compliance with relevant legislative requirements is provided in the following sections.

### 6.2 EPBC Act (Commonwealth)

#### 6.2.1 Background

The EPBC Act provides a mechanism for assessing the environmental impact of activities and development on MNES. A person must not, without an approval under the Act, take an action that has or will have, or is likely to have, a significant impact on any of the following MNES:

- world heritage properties or national heritage places.
- declared Ramsar wetlands.
- listed threatened species or ecological community.
- listed migratory species.
- Commonwealth marine area or Commonwealth land.

The Act also prohibits the taking, without an approval under the Act, of:

- a nuclear action; and
- an action in a Commonwealth marine area or on Commonwealth land that has or will have, or is likely to have, a significant impact on the environment.

MNES in NSW include:

- declared World Heritage areas.
- declared Ramsar wetlands.
- listed threatened species (Schedule 1 and 2 of the *Commonwealth Endangered Species Protection Act 1992*).
- listed ecological communities.
- listed migratory species (JAMBA and CAMBA).

An action includes a project, development, undertaking or an activity or series of activities. An action does not require approval if it is a lawful continuation of a use of land, sea or seabed that was occurring before the commencement of the Act. An enlargement, expansion or intensification of a use is not a continuation of a use.

The EPBC Act does not require Commonwealth approval for the rezoning of land; however, it does suggest that when rezoning land, planning authorities should consider whether to allow actions that could significantly affect MNES or the environment of Commonwealth land.

A Commonwealth assessment will be required for proposed activities on the subject site if they affect a MNES. The Commonwealth Department of the Environment has prepared EPBC Act Policy Statements, including the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (DotE 2013), which provides a self-assessment process to assist in determining whether an action should be referred to the Commonwealth for a decision on whether assessment and approval is required.

Where a project or action is believed to potentially cause a significant impact on a MNES, it is to be referred to the Australian Government Department of Agriculture, Water and the Environment (DAWE) for assessment as to whether the action is a 'controlled action' requiring Commonwealth approval for the proposed action. The proposed development has been considered against the Principal Significant Impact Guidelines for each of the MNES identified on the subject site. This assessment is provided in the following sections.

### **6.2.2 Declared world heritage areas**

There are no declared world heritage areas located on or near the subject site.

### **6.2.3 Declared Ramsar wetlands**

There are no declared Ramsar wetlands located on or near the subject site.

### **6.2.4 Commonwealth listed threatened flora and fauna species**

#### **6.2.4.1 Significant impact criteria**

An action is likely to have a significant impact on a critically endangered, endangered, or vulnerable species if it results in the following:

- a long-term decrease in the size of a population;
- reduction in the area of occupancy of the species;
- fragments an existing population into two or more populations;
- adversely affect habitat critical to the survival of a species;
- disrupts the breeding cycle of a population;
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;
- introduces disease that may cause the species to decline; or
- interferes with the recovery of the species.

A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered, or vulnerable threatened species, occurrences include but are not limited to a geographically distinct regional population, or collection of local populations, or a population, or collection of local populations that occur within a particular bioregion.

An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources, or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

#### 6.2.4.2 Applicability to the subject site

No threatened flora or fauna species was recorded on the subject site.

Due to the presence of a small number of flowering native trees (i.e. *Corymbia sp*, *Melaleuca sp.*) across the subject site, the very occasional presence of the threatened grey-headed flying-fox cannot be confidentially ruled out. Notwithstanding this, the loss of these trees is negligible when considering the species wide-ranging movements and commonly occurring native resources across the broader locality.

Given its coastal location it is likely that threatened flora and/or fauna species are present within proximity or traverse the subject site aerially from time to time. Despite this, the subject sites developed and disturbed nature means that it is highly unlikely to support an important population of any of the flora / fauna species listed as threatened under the *EPBC Act* (see **TABLE 2**), and as such there will be no significant impact on these species.

### **6.2.5 *Listed ecological communities***

#### 6.2.5.1 Introduction

Several tree species on the subject site have been identified as characteristic species for the EPBC Act TEC *Littoral Rainforest and Coastal Vine Thickets of Eastern Australia*. When making a determination as to whether this nationally listed ecological community is present at a particular site, the 'Description' (including the 'General Features' and 'Key Diagnostic Characteristics') and 'Condition Thresholds' of the listed ecological community as outlined in the Approved Conservation Advice for the ecological community must be used as the primary factor for determination rather than any other classification system.

An assessment of the subject site (with particular attention given to the focal area) vegetation against the description and condition thresholds included within the Approved Conservation Advice for the *Littoral Rainforest and Coastal Vine Thickets of Eastern Australia* ecological community has therefore been completed below.

#### 6.2.5.2 Description

The focal area is cleared and maintained as lawns and recreational facilities, but scattered native trees are still present. Of the eight (8) native (and endemic) tree species on the

subject site, four (4) species (and 5 individual trees) are characteristic of the *Littoral rainforest and costal vine thickets of eastern Australia* in the *Southern South Eastern Queensland and NSW North Coast* bioregion (TSSC 2008b), listed within schedules of the EPBC Act.

- **Small leaf fig (*Ficus obliqua*);**
- **Tuckeroo (*Cupaniopsis anacardioides*);**
- Pandanus (*Pandanus tectorius*);
- Paperbark (*Melaleuca quinquenervia*);
- Firewheel (*Stenocarpus sinuatus*);
- **Lilli Pilli (*Syzygium luehmannii*);**
- **Guioa (*Guioa semiglauca*);** and
- Bloodwood (*Corymbia intermedia*).

6.2.5.3 Condition thresholds

**TABLE 4** provides an assessment of the condition thresholds of the listing advice (TSSC 2008a; 2008b) for the EPBC Act TEC *Littoral Rainforest and Coastal Vine Thickets of Eastern Australia* against the characteristics of the community within the focal area.

**TABLE 4  
CONDITION THRESHOLDS FOR DETERMINING THE EPBC ACT LISTED *LITTORAL RAINFOREST AND COSTAL VINE THICKETS OF EASTERN AUSTRALIA* IN THE *SOUTHERN SOUTH EASTERN QUEENSLAND AND NSW NORTH COAST BIOREGION*.**

Condition threshold	Assessment
Small patches can be resilient and viable, but the minimum size of a patch needs to be 0.1 ha, AND	Yes - the patch on the subject site is larger than 0.1 ha.
The cover of transformer weed species (as identified in Attachment A) is 70% or less, AND	Yes - there is less than 70% transformer weed species present.
The patch must have:  at least 25% of the native plant species diversity characteristic of this ecological community in that bioregion, OR  at least 30% canopy cover of one rainforest canopy (either tree or shrub) species	No - four (4) species present on the subject site are characteristic of this ecological community in the <i>Southern South Eastern Queensland and NSW North Coast</i> (TSSC 2008b): <ul style="list-style-type: none"> <li>• Small leaf fig (<i>Ficus obliqua</i>)</li> <li>• Tuckeroo (<i>Cupaniopsis anacardioides</i>)</li> <li>• Lilli pilli (<i>Syzygium luehmannii</i>)</li> <li>• Guioa (<i>Guioa semiglauca</i>)</li> </ul> None of the above species comprise 30% canopy cover within the patch.

Notwithstanding the above condition characteristics, the developed and disturbed nature of the focal area and areas directly adjacent (i.e. BBST rail corridor, residential dwellings) have resulted in considerable gaps in the canopy of this community.

As per the condition thresholds notes of the listing advice, these canopy gaps *should be in the process of regenerating with the usual suite of rainforest gap species for the site* for the patch to be classified as the TEC, which in this instance they are not.

#### 6.2.5.4 Summary

Given the disturbed nature of the focal area (and broader subject site), and an absence of the required regeneration in the canopy gaps, the vegetation does not meet the minimum level for patches to be included in the listed ecological community. Despite this, the removal of four (4) key characteristic species (i.e. tuckeroo, lilli pilli, peanut tree and three veined laurel) should be offset by way of landscape plantings.

### **6.2.6 *Listed migratory species***

#### 6.2.6.1 Significant impact criteria

An action will require approval if the action has, will have, or is likely to have a significant impact on a listed migratory species. Note that some migratory species are also listed as threatened species. The significant impact criteria below are relevant to migratory species that are not threatened.

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

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

An area of 'important habitat' for a migratory species is:

- habitat used by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or
- habitat that is of critical importance to the species at life-cycle stages; and/or
- habitat utilized by a migratory species which is at the limit of the species range; and/or
- habitat within an area where the species is declining.

Listed migratory species cover a broad range of species with different life cycles and population sizes. Therefore, the definition of what an 'ecologically significant proportion' of the population is varies with the species (each circumstance needs to be evaluated). Some factors that should be considered include the species' population status, genetic distinctiveness, and species-specific behavioural patterns (for example, site fidelity and dispersal rates).

The term 'population' in relation to migratory species, means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one (1) or more national jurisdictional boundaries including Australia.

#### 6.2.6.2 Applicability to the subject site

Given its coastal location it is likely that migratory species are present within proximity or traverse the subject site aerially from time to time. Despite this, the subject site in isolation does not provide important habitat for any of the migratory species listed in **TABLE 3**. As a result, it is considered highly unlikely that the proposed development will have a significant impact on any migratory species.

#### **6.2.7 Requirement for commonwealth assessment**

Based on the above assessment, it is concluded that Commonwealth Assessment is not required for the proposed development of the subject site.

### **6.3 BC Act (NSW)**

#### **6.3.1 Background**

The NSW BC Act commenced on the 25<sup>th</sup> August 2017. The BC Act, together with the *Biodiversity Conservation Regulation 2017* (BCR), outlines the framework for addressing impacts on biodiversity from development and clearing. It establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the BOS.

The BOS creates a transparent, consistent, and scientifically based approach to biodiversity assessment and offsetting for all types of development that are likely to have a significant impact on biodiversity. It also establishes biodiversity stewardship agreements, which are voluntary in-perpetuity agreements entered into by landholders, to secure offset sites. There are five key steps to participating in the BOS for developers or landholders ('proponents') who want to undertake development or clearing.

- Step 1 - The proponent determines whether the BOS applies.
- Step 2 - An accredited assessor applies the Biodiversity Assessment Method and offsetting rules to the activity.
- Step 3 - The consent authority assesses the application and determines whether to approve or refuse the application.
- Step 4 - The consent authority determines the application and sets the offset obligation.

- Step 5 - The proponent satisfies its credit obligation and can begin the approved activity.

Step 1 of this process has been completed (in the following sections) as part of this EA to determine if the BOS applies to the proposed development. Additional steps (if required) will be completed separately, and in addition, to this EA report.

### **6.3.2 Biodiversity Offsets Scheme (BOS)**

#### 6.3.2.1 Background

The BOS applies to:

1. local development assessed under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP & A Act) that triggers the BOS threshold or is likely to significantly affect threatened species based on the test of significance in section 7.3 of the BC Act;
2. state significant development and state significant infrastructure projects, unless the Secretary of the Department of Planning and Environment and the Chief Executive of OEH determine that the project is not likely to have a significant impact;
3. biodiversity certification proposals;
4. clearing of native vegetation in urban areas and areas zoned for environmental conservation that exceeds the BOS threshold and does not require development consent;
5. clearing of native vegetation that requires approval by the Native Vegetation Panel under the LLS Act; and
6. activities assessed and determined under Part 5 of the EP & A Act (generally, proposals by government entities), if proponents choose to 'opt in' to the BOS.

Point 1 above applies to the proposed development.

#### 6.3.2.2 The BOS threshold

The BOS Threshold is a test used to determine when is necessary to engage an accredited assessor to apply the Biodiversity Assessment Method (BAM) to assess the impacts of a proposal.

It is used for local developments (development applications submitted to councils) and clearing that does not require development consent in urban areas and areas zoned for environmental conservation *i.e.* under the Vegetation SEPP.

The BCR sets out threshold levels for when the BOS will be triggered. The threshold has two elements:

1. whether the amount of native vegetation being cleared exceeds a threshold area set out below; and
2. whether the impacts occur on an area mapped on the BVM published by the Minister for the Environment.

If clearing and other impacts exceeds either trigger, the BOS applies to the proposed development including biodiversity impacts prescribed by clause 6.1 of the BCR.

Area clearing threshold

The area threshold varies depending on the minimum lot size (shown in the lot size maps made under the relevant LEP), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP) as shown in **TABLE 5** below. The area threshold applies to all proposed native vegetation clearing associated with a proposal, regardless of whether this clearing is across multiple lots.

**TABLE 5  
BOS AREA CLEARING THRESHOLD**

Minimum lot size associated with the property	Threshold for clearing, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

The minimum lot size associated with the front three (3) lots of the subject site (Lot 2 on DP582819, Lot 8 Sec 52 on DP758207 and Lot 9 Sec 52 on DP758207) is 0.40 ha (4000 m<sup>2</sup>). An area clearing threshold of 0.25 ha (2500 m<sup>2</sup>) or more therefore applies to these two (2) lots for entry into the BOS.

Lot 12 on DP1138310 and Lot 7 on DP841611 are zoned as 7(f2) Urban Coastal Lands Zone under the Byron LEP 1988, and as such does not have a minimum lot size assigned. To remain conservative, the smallest threshold of 0.25 ha (2500 m<sup>2</sup>) has been applied.

As a result, entry into the BOS is **not triggered** based on the area clearing threshold.

6.3.2.3 Biodiversity Values Map (BVM) threshold

The BVM identifies land with high biodiversity value, as defined by clause 7.3(3) of the BCR. The BOS applies to all clearing of native vegetation and other biodiversity impacts prescribed by clause 6.1 of the BCR on land identified on the map.

There are no biodiversity values mapped on the subject site or on adjacent properties, and therefore entry into the BOS is **not triggered** by the BVM threshold.

**6.3.3 Test of significance**

6.3.3.1 Background

In addition to the BOS Threshold, proponents are also required to carry out a 'test of significance' for all local development proposals. The test of significance is set out in section 7.3 of the BC Act and is used to determine if a development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

In determining the nature and magnitude of an impact, it is important to consider matters such as:

- Pre-construction, construction and occupation/maintenance phases;
- All on-site and offsite impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones;
- All direct and indirect impacts;
- The frequency and duration of each known or likely impact/action;
- The total impact which can be attributed to that action over the entire geographic area affected, and over time;
- The sensitivity of the receiving environment; and
- The degree of confidence with which the impacts of the action are known and understood.

Recovery and threat abatement plans, priorities action statements and threatened species profiles may provide further guidance on whether an action/activity is likely to be significant.

Application of the precautionary principle requires that a lack of scientific certainty about the potential impacts of an action does not itself justify a decision that the action is not likely to have a significant impact. If information is not available to conclusively determine that there will not be a significant impact on a threatened species, population or ecological community, or its habitat, then it should be assumed that a significant impact is likely.

#### 6.3.3.2 Endangered Ecological Communities (EECs)

##### ***Introduction***

The subject site contains scattered native trees that indicate the potential presence of the EEC - *Littoral rainforest in the NSW North Coast, Sydney Basin and South-East Corner bioregions* as listed within schedules of the BCC Act.

##### ***Description***

Notwithstanding the occasional presence of palm and fruit trees, the subject site contains the 17 scattered native and endemic trees (**APPENDIX 2**) with a paucity of native ground and shrub cover due to infrastructure, ongoing lawn maintenance and a beach volleyball court.

Of these, four (4) species are considered characteristic of the EEC *Littoral rainforest in the NSW North Coast, Sydney Basin and South-East Corner bioregions*:

- Small leaf fig (*Ficus obliqua*);
- Tuckeroo (*Cupaniopsis anacardioides*);
- Lilli Pilli (*Syzygium luehmannii*); and
- Guioa (*Guioa semiglauca*).

### ***Applicability to the subject site***

Littoral rainforest is typically recognised by its proximity to the ocean (<2 km) and closed canopy (at least 70%). With this considered, and despite the presence of some characteristic species, the small size and degraded / fragmented nature of the vegetation in the focal area (and broader subject site) suggests that it does not meet the relevant criteria for representing a **littoral rainforest EEC**.

Notwithstanding this, to remain precautionary a 'Test of Significance' has also been completed in accordance with the requirements of **Section 7.3** of the BC Act to undertake a qualitative analysis of the likely impacts on this 'potential' EEC (**APPENDIX 3**).

#### 6.3.3.3 Flora

No threatened flora species listed within schedules of the BC Act was recorded on the subject site.

#### 6.3.3.4 Fauna

No threatened fauna species listed within schedules of the BC Act were recorded during the site assessment.

Apart from the grey-headed flying-fox (addressed in **Section 7.2.4.2**) and the potential for some threatened species to be present in nearby coastal areas or traverse the subject site aerially from time to time, no other threatened species are considered possible occurrences on the subject site due to an absence of suitable habitat types and/or structural diversity. As a result, no significant impact is considered likely.

### **6.3.4 Summary**

Entry into the BOS is not triggered by the area clearing threshold or the BVM threshold.

As a precautionary principle, a 'Test of Significance' has been completed for the littoral rainforest EEC (**APPENDIX 3**). Despite the presence of some characteristic rainforest species, the small size and degraded / fragmented nature of the vegetation community in the focal area suggests that it does not meet the relevant criteria for representing a **littoral rainforest EEC**. Notwithstanding this, a 'Test of Significance' in accordance with Section 7.3 of the BC Act has determined that there would be no significant impacts on the littoral rainforest EEC because of the proposed development.

No other significant impacts on any relevant matters are likely to result from the proposed development.

In accordance with the requirements of the BCR it is therefore not considered necessary to engage an accredited assessor to apply the BAM to assess the impacts of the proposal or prepare a Biodiversity Development Assessment Report (BDAR) to accompany the development application.

## 6.4 Resilience and Hazards SEPP 2021

The entire subject site is mapped as Coastal Use Area. Any future development will need to comply with the Resilience and Hazards SEPP 2021 which includes:

*Development on land within the coastal use area*

- 1) *Development consent must not be granted to development on land that is within the coastal use area unless the consent authority—*
  - a. *has considered whether the proposed development is likely to cause an adverse impact on the following—*
    - i. *existing, safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,*
    - ii. *overshadowing, wind funnelling and the loss of views from public places to foreshores,*
    - iii. *the visual amenity and scenic qualities of the coast, including coastal headlands,*
    - iv. *Aboriginal cultural heritage, practices and places,*
    - v. *cultural and built environment heritage, and*
  - b. *is satisfied that—*
    - i. *the development is designed, sited and will be managed to avoid an adverse impact referred to in paragraph (a), or*
    - ii. *if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or*
    - iii. *if that impact cannot be minimised—the development will be managed to mitigate that impact, and*
  - c. *has taken into account the surrounding coastal and built environment, and the bulk, scale and size of the proposed development.*
- 2) *This clause does not apply to land within the Foreshores and Waterways Area within the meaning of Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005.*

## 6.5 Biodiversity and Conservation SEPP 2021 - Koala habitat protection 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) commenced on 1st March 2022. Chapter 4 - Koala Habitat Protection 2021 of the Biodiversity and Conservation SEPP contains the land-use planning and assessment framework for koala habitat within Metropolitan Sydney and the Central Coast and applies to all zones except RU1, RU2 and RU3 in the short term.

The principles of Chapter 4 - Koala Habitat Protection 2021 are to:

- Help reverse the decline of koala populations by ensuring koala habitat is properly considered during the development assessment process.
- Provide a process for councils to strategically manage koala habitat through the development of koala plans of management.

Chapter 4 - Koala Habitat Protection 2021 applies to all zones in the following nine (9) LGAs - Metropolitan Sydney LGAs (Blue Mountains, Campbelltown, Hawkesbury, Ku-Ring-Gai, Liverpool, Northern Beaches, Hornsby, Wollondilly) and the Central Coast LGA.

In all other identified LGAs, the provisions of Chapter 4 - Koala Habitat Protection 2021 do not apply to land zoned RU1 Primary Production, RU2 Rural Landscape or RU3 Forestry.

For all RU1, RU2 and RU3 zoned land outside of the Sydney Metropolitan Area and the Central Coast, Chapter 3 - Koala Habitat Protection 2020 of the Biodiversity and Conservation SEPP continues to apply. This is an interim measure while new land management and private native forestry codes are developed.

### **6.5.1 Relevance to the subject site**

The BCCKPoM (BSC 2015) was adopted by BSC in August 2016 as is prepared in accordance with the objectives of the Koala SEPP 2021 (now part of the Biodiversity and Conservation SEPP) and the approved NSW Koala Recovery Plan. As the subject site is covered by the Koala Plan of Management Part 2, Clause 10 of the Koala Habitat Protection SEPP 2021 applies. Any development on the subject site will need to be consistent with the BCCKPoM.

Part 4.1, Clause 4.2 of Chapter 4 - Koala Habitat Protection 2021 of the Biodiversity and Conservation SEPP defines koala habitat and core koala habitat as:

*“**Koala habitat** means koala habitat however described in a plan of management under this Policy or a former Koala SEPP and includes core koala habitat.”*

*“**Core koala habitat** means -*

- a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or*
- b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.”*

It is noted that the term **highly suitable habitat** is not defined within the Biodiversity and Conservation SEPP. However, a factsheet issued by the NSW Government provides the following definition:

*“**Highly suitable habitat** is where 15% or greater of the total number of trees within any Plant Community Type (PCT) are the regionally relevant species of those listed in Schedule 2 of the SEPP.”*

It is also noted that Part 3.1, Clause 3.2 of Chapter 3 - Koala Habitat Protection 2020 of the Biodiversity and Conservation SEPP "potential koala habitat" is defined as follows:

*"Potential koala habitat means areas of native vegetation where trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component."*

Under the BCCKPoM the subject site is included in the koala planning area and is mapped as part of the South Byron Coast KMA. Despite this, the subject site is **not** mapped as being part of a Koala Management Precinct (KMP) or containing 'highly suitable' or 'potential' koala habitat. The subject site does not contain any Preferred Koala Food Trees (PKFTs) as per the definitions set out in the BCCKPoM.

With the above considered, there is no evidence to indicate that the proposed development will have an impact on koalas or their habitat. No further investigation or management actions are considered necessary.

## 6.6 Byron Coast Comprehensive Koala Plan of Management (2015)

### 6.6.1 Background

The BCCKPoM applies to those lands within the identified koala planning area. The overall vision of the Plan is to enable a long-term, sustainable future for koala populations inhabiting the koala planning area. This vision is envisaged to be realised by way of the following aims:

- a) an increase in the total area of potential koala habitat in central parts of the koala planning area by a minimum of 20% to at least 1,800 ha, including consolidated linkages within and beyond the koala planning area;
- b) the presence of a self-sustaining, stable koala population of 250 - 300 individuals distributed equitably along the Byron Coast; and
- c) a community that is collectively informed and committed to a sustainable future for the Byron Coast koalas.

The Koala Management Framework is expressed in the CCKPoM through:

- the identification and classification of koala habitat;
- the identification of areas known to contain resident koala populations;
- the division of the koala planning area into Koala Management Areas (KMAs) and Koala Management Precincts (KMPs); and
- management principles for habitat buffer areas and koala corridors.

### 6.6.2 Applicability to the subject site

As discussed in **SECTION 6.5**, the subject site is included in the koala planning area and is mapped as part of the South Byron Coast KMA. Despite this, the subject site is **not** mapped as being part of a Koala Management Precinct (KMP) or containing potential koala habitat and does not contain PKFTs. As a result, no further actions are considered necessary.

## 6.7 Byron DCP (2014), Chapter B1 - Biodiversity

### 6.7.1 Background

The aim of the Biodiversity DCP (Chapter B1) is to ensure that, subject to any relevant overarching state or commonwealth legislation, the planning and design of new development maintains or improves ecological values within Byron Shire thereby increasing the resilience of natural areas and supporting both biodiversity and climate adaptation. The objectives of the Biodiversity DCP are:

- 1) Identify, retain and restore native vegetation and habitats for native species in patches of a size and configuration that will enable existing plant and animal communities to survive in the long term and support climate adaptation.
- 2) Identify and retain high carbon storage ecosystems (e.g. blue carbon systems such as salt marsh, mangroves and sea grasses), wildlife corridors and refugia.
- 3) Provide development controls that prevent the degradation or loss of ecological values and or biodiversity.
- 4) Provide guidance on the information required to enable informed decision- making.
- 5) Ensure that construction and operational impacts of development are avoided and or mitigated using current best practice standards.
- 6) Provide guidance on acceptable measures to avoid or minimise the impact of proposed development on biodiversity including proposals affected by Part 7 of the BC Act and the Koala Habitat Protection SEPP.
- 7) Compensate for unavoidable habitat losses in accordance with applicable legislation, or in the absence of such legislation, contemporary best practice.

This section provides an assessment of compliance with the relevant sections of the Byron Shire Council DCP - Chapter B1.

### 6.7.2 Applicability to the subject site

The subject site is mapped as containing the following 'red flagged' area as listed in Table 3 of the Biodiversity DCP:

- High Environmental Value (HEV) vegetation
  - Threatened Ecological Community

Given the disturbed nature of the focal area (and broader subject site), limited extent of the vegetation community, and an absence of the natural regeneration, vegetation in the focal area (and across the broader subject site) does not satisfactorily meet the requirements to be considered a TEC or EEC under the EPBC Act and BC Act, respectively. In addition, a precautionary 'Test of Significance' in accordance with Section 7.3 of the BC Act determined there would be **no significant impacts** on the 'potential' littoral rainforest EEC in the focal area.

It should be noted that areas mapped as HEV vegetation over 2 Milton Street, has been entirely cleared for past residential development. This part of the subject site retains no vegetation.

With the above assessments considered, a required ecological setback of 30 m is not deemed necessary in this case. Adequate setbacks are already in place between areas of mapped littoral rainforest and the focal area by way of the BBST rail corridor. This buffer will be required to be maintained for the purposed of asset protection (i.e. bushfire).

The proposed development will remove at least 16 native and endemic trees, of which five (5) are characteristic species for littoral rainforest. However, as previously discussed, vegetation in the focal area (and broader subject site) does not meet the criteria to be classified as a TEC / EEC; however, it is recommended that characteristic species being removed are offset through revegetation/landscaping on site with species characteristic of the Littoral rainforest EEC.

A VMP is recommended as per B1.2.5 of the Biodiversity DCP. Among other things, the VMP should provide guidelines for offsetting and for protecting the retained fig tree (see **SECTION 5.2.2**).

## 7 SUMMARY AND CONCLUSIONS

JWA Pty Ltd have been engaged by Vitale Property Group Pty Ltd to complete an Ecological Assessment (EA) to accompany a development application for land in Byron Bay, NSW, and formally described as the following (the subject site):

- 29 Shirley Street: Lot 12 on DP1138310, Lot 2 on DP582819, Lot 7 on DP841611, Lot 8 Sec 52 on DP758207 and Lot 9 Sec 52 on DP758207.
- 2 Milton Street: Lot 11 on DP113831, Lot 9 on DP841611, Lot 8 on DP841611, and Lot 1 on DP780935.
- 4 Milton Street: Lot 1 on DP582819 and Lot 2 on DP582819.

The subject site is located less than 1 km from the Byron Bay central business district, and is bound by urban development to the east, south and west. To the north of the subject site is the BBST rail corridor, and narrow strip of native / coastal vegetation that connects to the beach.

Most of the subject site is developed and used as private residence or backpacker's accommodation. With the exception of some scattered landscape trees (i.e. palms), these areas are void of vegetation. The back third of the backpackers contains scattered vegetation, maintained lawns and a beach volleyball court. This area contains the most likely (and arguably 'only') ecological features on the subject site, and therefore forms a primary focus of this assessment (where applicable referred to as the 'focal area').

No threatened flora or fauna species was recorded on the subject site; however, due to the presence of a small number of flowering native trees, the very occasional presence of the threatened grey-headed flying-fox cannot be confidentially ruled out. Notwithstanding this, the loss of these trees is negligible when considering the species wide-ranging movements and commonly occurring native resources across the broader locality.

In addition, given its coastal location it is likely that threatened flora and/or fauna species are present within proximity or traverse the subject site aerially from time to time. Despite this, the subject sites developed and disturbed nature means that it is highly unlikely to support an important population of any threatened flora / fauna species, and therefore any significant impact is considered highly unlikely.

The focal area is cleared and maintained as lawns and recreational facilities, but scattered native trees are present. Of the eight (8) native (and endemic) tree species on the subject site, four (4) are characteristic of the *Littoral rainforest and coastal vine thickets of eastern Australia* in the *Southern South Eastern Queensland and NSW North Coast* bioregion, listed within schedules of the EPBC Act. In addition, the same species are considered characteristic of the EEC *Littoral rainforest in the NSW North Coast, Sydney Basin and South-East Corner bioregions*, listed within schedules of the BC Act.

Notwithstanding this, the disturbed nature of the focal area (and broader subject site), limited extent of the vegetation community, and an absence of the natural regeneration, vegetation does not satisfactorily meet the requirements to be considered a TEC or EEC

under the EPBC Act and BC Act, respectively. In addition, a precautionary 'Test of Significance' in accordance with Section 7.3 of the BC Act determined there would be **no significant impacts** on the 'potential' littoral rainforest EEC.

The BOS Threshold test has determined that the proposed development will not trigger the relevant area clearing threshold or include impacts on an area mapped on the Biodiversity Values map published by the Minister for the Environment. In accordance with the requirements of the BCR it is not considered necessary to engage an accredited assessor to apply the BAM to assess the impacts of the proposal or prepare a Biodiversity Development Assessment Report (BDAR) to accompany the development application.

Under the BCCKPoM the subject site is included in the koala planning area and is mapped as part of the South Byron Coast KMA. Despite this, the subject site is **not** mapped as being part of a Koala Management Precinct (KMP) or containing potential koala habitat. The subject site does not contain any Preferred Koala Food Trees (PKFTs) as per the definitions set out in the BCCKPoM. With this considered, there is no evidence to indicate that the proposed development will have an impact on koalas or their habitat. No further investigation or management actions are considered necessary.

In accordance with the BSC Biodiversity DCP, the subject site is mapped as containing 'red flagged' High Environmental Value (HEV) vegetation. However, considering the assessments against the EPBC Act and BC Act, a required ecological setback of 30 m is not deemed necessary in this case. Adequate setbacks are already in place between areas of mapped littoral rainforest and the focal area by way of the BBST rail corridor. This buffer will be required to be maintained for the purpose of asset protection (i.e. bushfire).

The proposed development will remove at least 16 native and endemic trees, of which five (5) are characteristic species for littoral rainforest. However, as previously discussed, vegetation does not meet the criteria to be classified as a TEC / EEC; however, it is recommended that characteristic species being removed are offset through revegetation/landscaping on site with species characteristic of the Littoral rainforest EEC. A VMP is recommended as per B1.2.5 of the Biodiversity DCP. Among other things, the VMP should provide guidelines for offsetting and for protecting retained vegetation in the focal area (see **SECTION 5.2.2**).

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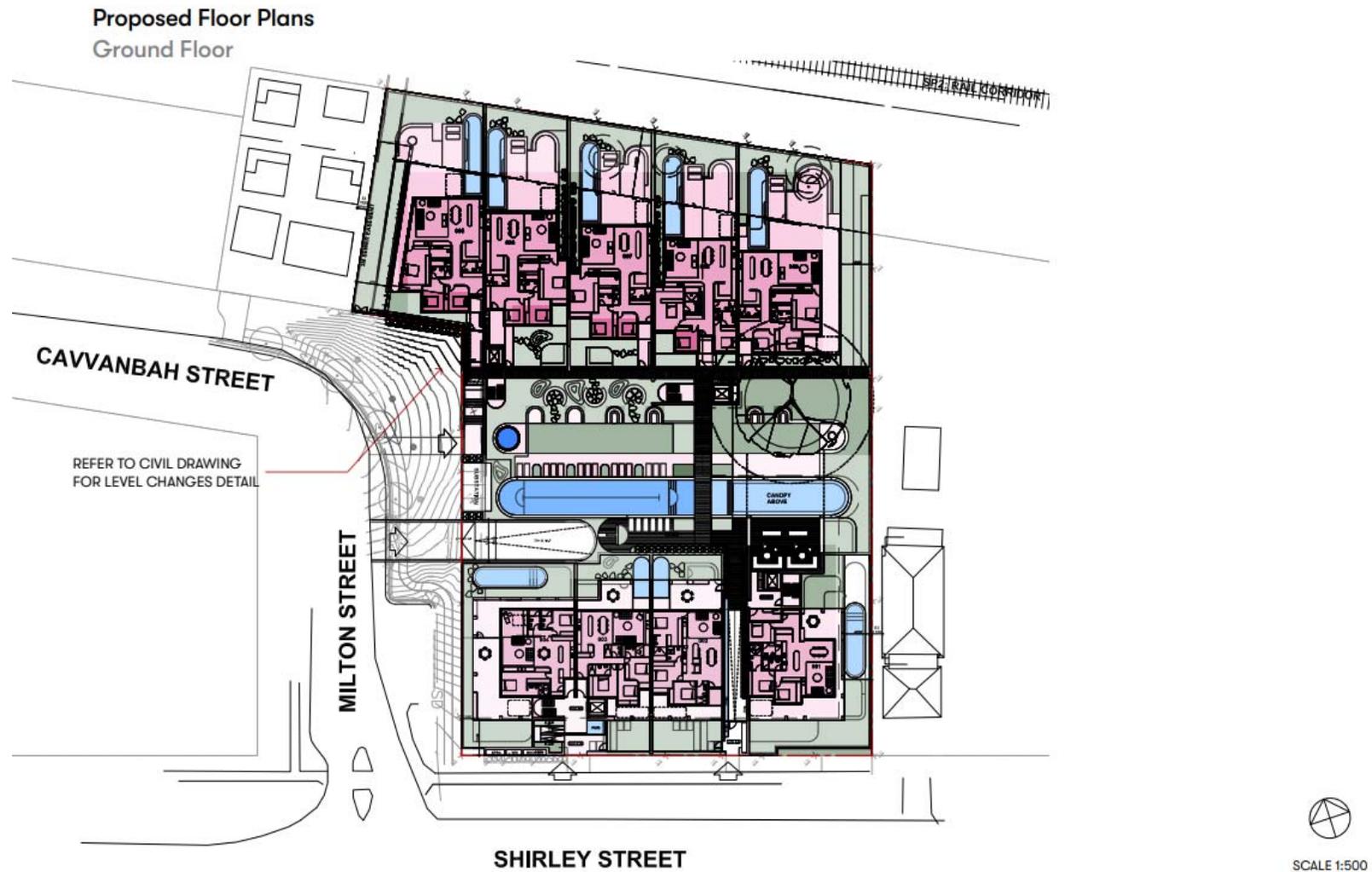
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## APPENDIX 1 - PROPOSED LAYOUT (GROUND FLOOR)

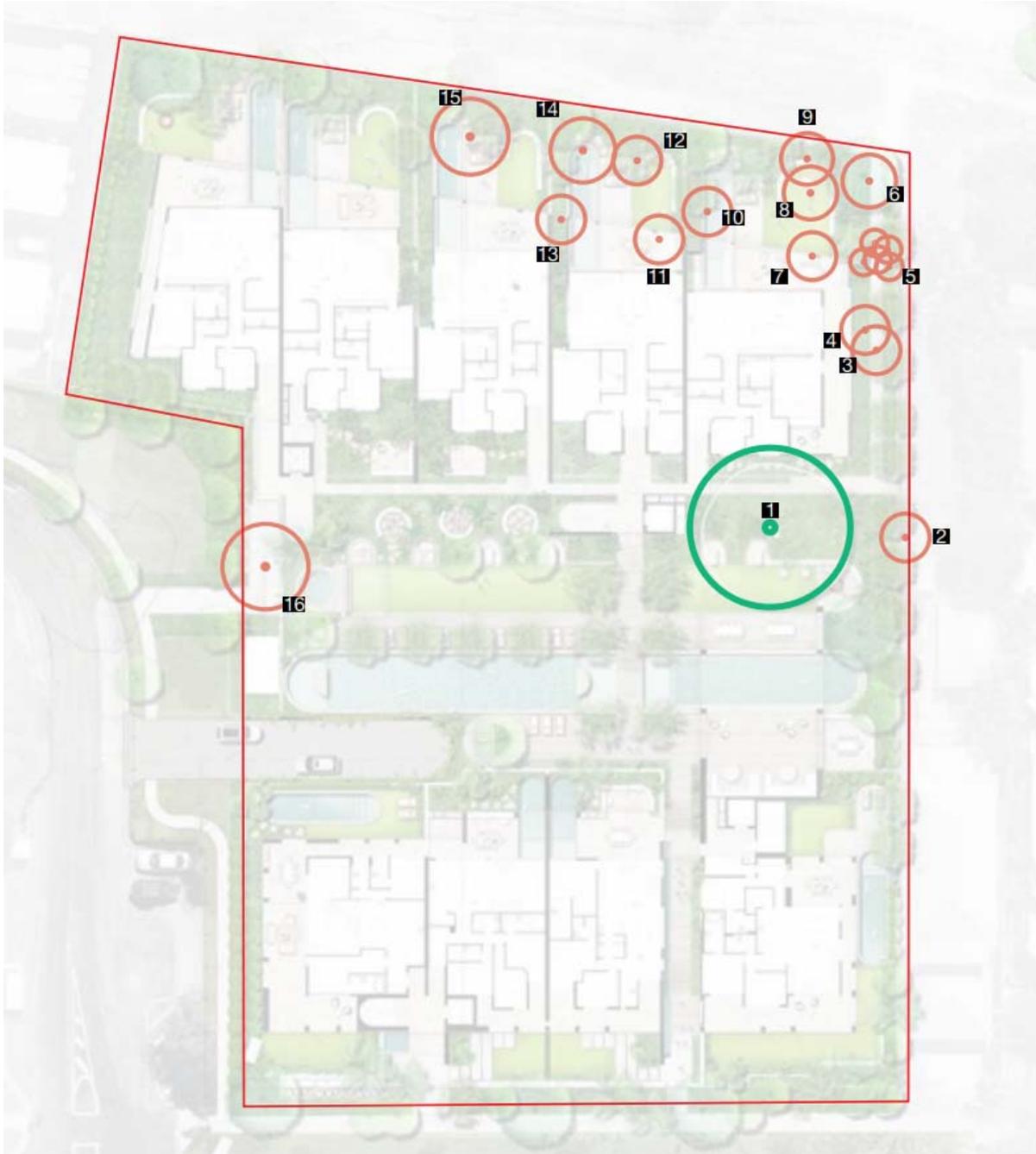
Source: Development Application (dated 3<sup>rd</sup> August 2022)



## APPENDIX 2 - TREE LOCATIONS AND PROPOSED REMOVAL

Source: Statement of Landscape Intent (dated April 2022)

Green = retain | Red = remove



## APPENDIX 3 - ASSESSMENTS OF SIGNIFICANCE (5-PART TEST)

### Littoral Rainforest - Endangered Ecological Community (EEC)

*(a) In the case of a Threatened species, whether the life cycle of the species is likely to be disrupted such that a viable local population of the species is likely to be placed at risk of extinction.*

Not applicable to EECs.

*(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.*

Not applicable to EECs.

*(c) In the case of an endangered ecological community or critically endangered ecological community whether the action proposed:*

- is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction;*

According to the *Threatened Species Test of Significance Guidelines (OEH 2018)*, the local occurrence of a community is defined as follows:

*“Local occurrence: the ecological community that occurs within the study area. However, the local occurrence may include adjacent areas if the ecological community on the study area forms part of a larger contiguous area of that ecological community and the movement of individuals and exchange of genetic material across the boundary of the study area can be clearly demonstrated.”*

Based on written advice regarding a previous test of significance for this EEC, the local occurrence of an EEC may be comprised of multiple patches that are not directly adjoining, in recognition that genetic exchange can occur over a considerable distance. Indeed, dispersal of genetic material for plants within the littoral rainforest community on the subject site may occur via one or a combination of the following methods:

1. Bird and bat dispersal - Dispersal of seeds by birds and flying foxes is well documented and is likely to be the primary method of genetic exchange between the site and other local EEC patches.

As examples, the diagnostic flora species of the EEC on the subject site (i.e. small leaf fig, tuckeroo, lilli pilli) are dispersed by highly mobile bird species including Australasian figbird (*Sphecotheres vieilloti*), green catbird (*Ailuroedus crassirostris*), and pied currawong (*Strepera graculina*).

In addition, flying-foxes are recognised as the most effective seed dispersers and pollinators of rainforest vegetation communities. Unlike birds and insects, flying-foxes have the advantages of a large body size combined with a fur coat that allows pollen

to stick to and be transported potentially up to 50 km in one night. Flying-foxes can also carry small seeds of rainforest fruits in their gut for up to an hour, by which time they may have flown 30 km away from where the fruit was eaten.

2. Wind dispersal - some plants have seeds that are adapted to reduce their fall time (i.e. small, light seeds or those with structures designed to catch wind), hence facilitating their ability to be carried over greater distances by wind. Wind is likely to play a role for some plant species in genetic exchange between the site and nearby EEC patches.

With consideration of the surrounding area, approximately 7.5 ha of mapped littoral rainforest is located within 1.2 km of the subject site, with the closest (and largest) patch less than 20 m away (across the BBST rail corridor). Although the extent of flora species which make up the composition of the littoral rainforest patch on the subject site is low, all species can be pollinated/have genetic material exchanged by mobile vectors. Therefore, when applying the description of local occurrence for EEC's from the guidelines (OEH 2018), which includes where 'movement of individuals and exchange of genetic material across the boundary of the subject site can be demonstrated', it is reasonable to assume other 'patches' within proximity of the subject site can be included as contiguous.

With consideration of the above, there is potential for genetic exchange to occur between the highly disturbed patch of potential littoral rainforest EEC on the subject site and patches of similar vegetation adjacent to or nearby, and potentially throughout the region. However, for the purpose of this assessment the 'local occurrence' has considered patches of similar vegetation occurring immediately adjacent and nearby to the site. In this regard, a review of the 'vegetation communities (2021)' mapping under the BSC LEP, identified that no less than 11 ha of littoral rainforest is mapped within 1.2 km of the potential EEC patch on the subject site. The "local occurrence" of this EEC is likely to extend well beyond 1.2 km as discussed above.

The composition of potential littoral rainforest on the subject site is limited to five (5) diagnostic trees. Excluding trees that are being retained, the proposed development will result in the removal of at least seven (7) native and endemic tree species, of which three (3) are considered characteristic of littoral rainforest. This equates to less than 1% of the potential littoral rainforest EEC identified within approximately 1.2 km of the subject site. It is also noted that the highly degraded condition and fragmented nature of this patch, and its presence in the urban landscape, suggests that the patch is unlikely to be able to maintain its integrity over time. This relatively isolated and highly degraded patch of littoral rainforest EEC is considered to make minimal contribution to the extent of this vegetation type in the locality and the less than 1% loss of vegetation extent is therefore an overestimate when considering these limiting factors.

For the above reasons the removal of a small number of scattered and disturbed diagnostic littoral rainforest trees is considered highly unlikely to place the local occurrence of this EEC at risk of extinction.

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

The removal of approximately 0.1 ha (or five diagnostic trees) of this community will not place the local occurrence of this EEC at risk of extinction for the following reasons:

1. Areas identified as representing this EEC within the site are degraded and maintained as lawns and for recreation activities with a limited number of scattered diagnostic tree species.
2. The subject site's developed status and degraded vegetation community has very low connectivity values.
3. The removal of approximately 0.1 ha equates to less than 1% of the extent of this community within approx. 1.2 km of the EEC patch on the subject site. Furthermore, the "local occurrence" of this EEC is likely to extend well beyond 1.2 km.
4. Significant areas of good quality littoral rainforest EEC are known from the locality including areas protected in nature reserves/national parks.

Given the above, it is determined that the proposed development will not adversely affect the extent of the ecological community nor adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

***(d) In relation to the habitat of a threatened species, population or ecological community:***

- ***the extent to which habitat is likely to be removed or modified as a result of the action proposed, and***

The proposed development will necessitate the removal of approximately 0.1 ha of highly degraded and fragmented littoral rainforest EEC from the site. As discussed above, this equates to less than 1% of the extent of this community within approx. 1.2 km of the EEC patch on the subject site and the extent of the "local occurrence" of this EEC is likely to extend well beyond 1.2 km. Furthermore, the highly degraded condition and fragmented nature of this patch, and its presence in the urban landscape, suggests that the patch is unlikely to be able to maintain its integrity over time. This isolated and highly degraded patch of littoral rainforest EEC is therefore considered to make minimal contribution to the extent of this vegetation type in the locality and the less than 1% loss of vegetation extent is an overestimate when considering these limiting factors.

- ***whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and***

The patch is already fragmented from nearby patches due to a maintained rail footprint and urban development, making any exchange of genetic material between patches limited to birds, bats or wind. Nonetheless, the littoral rainforest EEC located on the subject site is highly degraded regular maintenance that has prevented any natural regeneration in the canopy gaps. The proposed development is unlikely to contribute significantly to an increase in the fragmentation of habitat for the Littoral rainforest EEC.

- ***the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.***

The littoral rainforest EEC on the subject site is in a highly degraded state, comprises limited and scattered diagnostic flora species, and has relatively low connectivity value. The area to be removed equates to less than 1% of the extent of this EEC within approx. 1.2 km of the EEC patch on the subject site. Furthermore, as discussed above, the “local occurrence” of this EEC is likely to extend well beyond 1.2 km from the site. The highly degraded condition and fragmented nature of this patch, and its presence in the urban landscape, suggests that the patch is unlikely to be able to maintain its integrity over time. This isolated and highly degraded patch of Littoral rainforest EEC is therefore considered to make minimal contribution to the extent of this vegetation type in the locality and is not considered to be important to the long-term survival of the ecological community in the locality.

***(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).***

There will be no adverse effects on any of the critical habitats listed under the BC Act.

***(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.***

No Approved Recovery Plans or Threat Abatement Plans have been prepared for the littoral rainforest the EEC.

***(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of a key threatening process.***

A “threatening process” means a process that threatens, or may have the capability to threaten, the survival or evolutionary development of a species, population or ecological community. Key Threatening Processes (KTP) have been listed in Schedule 4 of the *BC Act (2016)*.

Key Threatening Processes (Schedule 4):

- Aggressive exclusion of birds from woodland and forest habitat by abundant **Noisy Miners** (*Manorima melanocephala*)
- Alteration of habitat following **subsidence due to longwall mining**
- **Alteration to the natural flow regimes** of rivers, streams, floodplains & wetlands
- Anthropogenic Climate Change
- **Bushrock Removal**
- Clearing of **native vegetation**
- Competition and grazing by the **feral European rabbit** (*Oryctolagus cuniculus*)
- Competition and habitat degradation by **feral goats** (*Capra hircus*)

- Competition from **feral honeybees** (*Apis mellifera*)
- Death or injury to marine species following capture in **shark control programs on ocean beaches**
- Entanglement in, or ingestion of **anthropogenic debris in marine and estuarine environments**
- Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners
- Habitat degradation and loss by feral horses
- Herbivory and environmental degradation caused by **feral deer**
- High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
- Importation of **Red Imported Fire Ants** (*Solenopsis invicta*)
- Infection by **Psittacine Circoviral (beak & feather) Disease** affecting endangered psittacine species and populations
- Infection of frogs by amphibian chytrid causing the disease chytridiomycosis
- Infection of native plants by *Phytophthora cinnamomi*
- Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae
- Introduction of the Large Earth Bumblebee (*Bombus terrestris*)
- Invasion and establishment of **exotic vines and scramblers**
- Invasion and establishment of Scotch Broom (*Cytisus scoparius*)
- Invasion and establishment of the **Cane Toad** (*Bufo marinus*)
- Invasion, establishment and spread of **lantana** (*Lantana camara*)
- Invasion of native plant communities by African Olive (*Olea europaea* subsp. *cuspidata*)
- Invasion of native plant communities by *Chrysanthemoides monilifera*
- Invasion of native plant communities by **exotic perennial grasses**
- Invasion of the **yellow crazy ant** (*Anoplolepis gracilipes*)
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants
- Loss of **hollow-bearing trees**
- Loss and degradation (or both) of **sites used for hill-topping by butterflies**
- Predation and hybridisation by **Feral Dogs** (*Canis lupus familiaris*)
- Predation by **Gambusia holbrooki** (Plague Minnow or Mosquito Fish)
- Predation by the **European Red Fox** (*Vulpes vulpes*)
- Predation by the **Feral Cat** (*Felis catus*)

- Predation by the **Ship Rat (*Rattus rattus*) on Lord Howe Island**
- Predation, habitat degradation, competition and disease transmission by **Feral Pigs (*Sus scrofa*)**
- Removal of **dead wood and dead trees**.

Given the urban / residential setting, some KTPs are likely to be already widespread across the landscape. These include the following:

- Clearing of **Native Vegetation**;
- Invasion and establishment of **exotic vines and scramblers**
- Invasion, establishment and spread of (*Lantana camara*);
- Invasion of native plant communities by **exotic perennial grasses**;
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants;
- Invasion and establishment of the **Cane Toad (*Bufo marinus*)**; and
- Predation by the **Feral Cat (*Felis catus*)**.

The proposed development will contribute towards the '**Clearing of native vegetation**'. The final determination of the NSW Scientific Committee notes that clearing of native vegetation is recognised as a major factor contributing to loss of biological diversity, with impacts such as: destruction of habitat; fragmentation of habitat; riparian zone degradation; increased greenhouse gas emissions; increased habitat for invasive species; loss of leaf litter layer; loss or disruption of ecological function (e.g. loss of populations of pollinators or seed dispersers) and changes to soil biota.

Habitat loss is the main threatening process affecting all subject species. The proposed development will make a minor contribution towards the loss of habitat in the region. However, as previously discussed, the vegetation to be lost has been highly disturbed by past/current development and land use activities, and therefore is not considered to be important to the long-term survival of the ecological community in the locality. In addition, the native vegetation to be removed will be replaced at a ratio of 10:1 to bolster nearby mapped littoral rainforest areas.

The proposed development has the potential to result in an increase in the '**Invasion and establishment of exotic vines and scramblers**', '**Invasion of native plant communities by exotic perennial grasses**', '**Invasion, establishment and spread of *Lantana camara***' and '**Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants**'. Exotic vines, scramblers and aquatic plants may be introduced to native vegetation communities and animal habitat via garden escapees or the illegal dumping of garden waste. Future landowners should be encouraged not to plant invasive or undesirable vines, scramblers and aquatic plants. Illegal dumping is an offence under the Protection of the *Environment Operations Act 1997*. The invasion by exotic perennial grasses and lantana may occur if native vegetation communities are disturbed (e.g. by unlawful clearing, trampling, creation of tracks etc.). The level of risk associated

with these KTPs is considered to be low given the development will not directly adjoin any littoral rainforest EEC areas.

Cane toads are likely to be already established within the subject site. The proposed development is unlikely to result in increased numbers of cane toads.

Cats may be categorised as domestic, stray or feral. Domestic cats are pet or house animals living with people; their ecological requirements are intentionally provided by humans. Stray cats rely only partly on humans for provision of their ecological requirements, and include animals in urban fringe situations, dumped animals, and cats kept on farms for rodent control. Feral cats are free-living; they have minimal or no reliance on humans for their ecological requirements and survive and reproduce in self-perpetuating populations. Individuals can shift between categories in their lifetimes. This KTP concerns only feral cats; however, domestic or stray cats from the proposed development may contribute to the overall numbers if allowed to roam. Cats will have no direct impact on the littoral rainforest EEC but may impact the fauna species that naturally inhabit this vegetation type. Mandatory registration of domestic cats and identification of animals by way of micro-chip and using a collar and tag with owner's contact details (in accordance with the *Companion Animals Act 1998*) will assist in reducing the risk of increasing the impact of this KTP.

## **Summary - Result of the Assessment of Significance**

Based on the assessments provided above, and given the recommended provisions for offsets, there will be no significant impacts on the littoral rainforest EEC because of the proposed development. The assessment of KTPs also concluded that with the adoption of the recommended management actions, the proposed development is unlikely to exacerbate these KTPs on top of what is already present. It is therefore concluded that a Species Impact Statement (SIS) is not required for impacts of the proposed development on degraded littoral rainforest EEC vegetation occurring on the subject site.