



ECOLOGICAL ASSESSMENT

Terranora Rise Marana Street, Bilambil Heights

> A Report Prepared for GemLife

> > JANUARY 2025

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ABBREVIATIONS

Abbreviation	Description
~	Approximately
BAM	Biodiversity Assessment Method
BC Act	NSW Biodiversity Conservation Act 2016
BCR	Biodiversity Conservation Regulation 2017
BDAR	Biodiversity Development Assessment Report
BOS	Biodiversity Offset Scheme
BV Map	Biodiversity Values Map
CEEC	Critically Endangered Ecological Community
CM Act	Coastal Management Act 2016
DA	Development Application
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DCP	Development Control Plan
DGEAR	Director General Environmental Assessment Requirements
DoPE	Department of Planning and Environment
DotE	Department of the Environment
EA	Ecological Assessment
EEC	Endangered Ecological Community
EP & A Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
Ha	Hectare
JWA	JWA Pty Ltd
Km	Kilometre
KMA	Koala Management Areas
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
PKFT	Preferred Koala Food Tree
РКН	Preferred Koala Habitat
PMST	Protected Matters Search Tool
SEPP	State Environmental Protection Policy
SEQ	South East Queensland
SRPMP	Site Rehabilitation & Pest Management Plan
TCCKPoM	Tweed Coast Comprehensive Koala Plan of Management
TEC	Threatened Ecological Community
TSC	Tweed Shire Council
VZ	Vegetation Zone

1 INTRODUCTION

1.1 Background

JWA Pty Ltd (JWA) have been engaged by GemLife to complete an Ecological Assessment (EA) for land at Marana Street, Bilambil Heights; otherwise described as Lot 32 on DP1085109 (herein referred to as the 'subject site') (FIGURE 1).

The subject site is part of a larger (184 ha) Concept Plan for the area and that was authorised in October 2008 by the Minister for Planning and is contained within the Far North Coast Regional Strategy for Urban Expansion, plus the proposed Sports Park and sections of the proposed Rise residential community at Bilambil Heights. The Director General subsequently issued Environmental Assessment Requirements (DGEAR's) in February 2009.

Responses to the DGEAR's were prepared in July 2009 and included (among other things) an EA (Volume 1) and Site Rehabilitation & Pest Management Plan (Volume 3) (SRPMP) prepared by JWA. After submissions from the public and government agencies, the overall proposed development layout and concept plan was revised and approved (No. 08_0234).

It is understood that Gemlife proposed to submit a modification to the Rise Concept Plan approval (MP 08_0234) over the area referred to as 'Precinct B' in the State approved Master Plan.

This EA involved a two-stage approach. Firstly, a desktop review was undertaken to identify updated Commonwealth, State and Local environmental constraints that may apply. These include (but may not be limited to), the presence of significant vegetation communities, potential habitat for threatened flora or fauna, and/or ecologically sensitive areas. Secondly, as guided by the desktop review, several past and recent field assessment have been interrogated to confirm the presence or likely presence of flora, fauna, and habitat.

This EA has involved the following:

- determining the suite of Commonwealth and State listed threatened and regionally or locally significant flora and fauna species that occur in the locality from literature and database records;
- assessing the likelihood of occurrence of threatened flora and fauna species;
- assessing habitat provided and the context of the surrounding area;
- assessing the corridor values at a local and regional scale;
- assessing the potential impacts of the proposed modification and any subsequent development and determining appropriate mitigation measures;
- addressing statutory requirements regarding impacts to flora and fauna;
- addressing relevant development assessment codes and policies; and
- assessment of the proposed modification and any subsequent development against the relevant TSC planning and development controls.

1.2 The Subject Site

The subject site covers an area of approximately 6.62 ha and encompasses land in the far eastern portion of the broader 'Rise Bilambil Heights' site (identified as Precinct B on the Approved Master Plan) (FIGURE 2).

The subject site is located approximately 7 km southwest of the Tweed Central Business District and 8.5 km west from the coastal fringe. The Terranora Broadwater is located approximately .5 km to the east and includes the Tweed Estuary system (i.e., Bilambil Creek, Terranora Creek etc.). The Cobaki Nature Reserve and Cobaki Broadwater is approximately 4 km to the east north-east.

The subject site itself is predominately cleared and maintained grassland with occasional scattered trees and no intact vegetation. Residential dwellings associated with the broader Bilambil Heights township exist to the east of the subject site and associated with McAllisters Road and Marana Street border the north and south, respectively. To the west is the disused Terranora Golf Resort and associated grazing land.

A recent aerial photograph showing the subject site is provided in **FIGURE 3**.

1.3 Planning Context

The subject site is part of the broader 'Rise Bilambil Heights' site that is <u>excluded</u> from the Tweed LEP Land Application Map, and the State Environmental Planning Policy (Major Development) 2005 (Major Development SEPP) applies. The planning intent under the State Approved Master Plan is for 'Retirement Living' (FIGURE 2).

Under the Major Development SEPP Rise Bilambil Heights land zoning map (sheet LZN 001), the subject site is zoned as General Residential (FIGURE 4).

1.4 Relevant Legislation

It is important to note that the transitional and savings provision of various NSW legislation is applicable to the proposed modification and any subsequent development. In this regard, the following repealed legislation is relevant to this assessment:

- Threatened Species Conservation Act 1995 (TSC Act) the version in force immediately before its repeal (which is saved under the transitional provisions of the Biodiversity Conservation Act [BC Act]);
- State Environmental Planning Policy No. 14 (SEPP 14) the version in force immediately before its repeal (which was saved under the transitional provisions of the Coastal Management SEPP, which are in turn saved by virtue of provisions in the *Interpretation Act 1987* despite the repeal of the Coastal Management SEPP by the State Environmental Planning Policy (Resilience and Hazards) 2021;
- State Environmental Planning Policy No. 26 (SEPP 26) the version in force immediately before its repeal (which is saved for the same reasons as SEPP 14);

- State Environmental Planning Policy No. 71 (SEPP 71) the version in force immediately before its repeal (which is saved for the same reasons as SEPP 14); and
- State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) in particular the current Chapter 3.

Other relevant legislation addressed in this assessment include:

• Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act);

<u>Note</u>: As per Part 26, Division 1 (5) of the Major Development SEPP "the only environmental planning instruments that apply, according to their terms, to land within the Rise Bilambil Heights site are this Policy and all other State environmental planning policies, other than State Environmental Planning Policy No 1–Development Standards". Given the above legislative standings, the Tweed LEPs and Development Control Plans (DCPs) do not apply.

1.5 Previous Surveys / Studies

The following reports / field assessments (**TABLE** 1) have been undertaken by JWA and others on, or adjacent to the subject site. These have been discussed where relevant throughout this EA.

Report	Flora	Survey year(s)	Fauna	Survey year(s)
WBM Oceanics (1996). <i>Terranora Golf Project - Flora and Fauna Report</i> . A report prepared for Weathered Howe Pty Ltd.	~	1996	~	1996
JWA (2004). Flora and Fauna Assessment. A Report to Masterbuilt Building Lifestyles.	~	2004	~	2004
JWA (2005). Flora and Fauna Assessment - Marana Street, Terranora lakes project, Bilambil. A Report to Terranora Group Management Pty Ltd.	~	2005	~	2005
JWA (2007). Flora and Fauna Assessment - Pacific Highlands Estate, Bilambil Heights. A Report to Terranora Group Management Pty Ltd.		2005 2006 2007		2006 2007
JWA (2009a). Rise Estate, Bilambil Heights West Tweed - Volume 1 - Ecological Assessment. A Report to Terranora Group Management Pty Ltd. JWA (2009b). Rise Estate, Bilambil Heights West Tweed - Volume 2 - Appendices to the Ecological Assessment. A	~	2009*	~	2009*
JWA (2009c). Rise Estate, Bilambil Heights West Tweed - Volume 3 - Site Rehabilitation and Pest Management Plan. A Report to Terranora Group Management Pty Ltd.				

 TABLE 1

 ASSESSMENTS COMPLETED ON OR ADJOINING THE SUBJECT SITE

Report	Flora	Survey year(s)	Fauna	Survey year(s)
JWA (2010). <i>Revised Ecological Assessment</i> . A Report to Terranora Group Management Pty Ltd.				
Biolink (2011). <i>Tweed Coast Koala Habitat Study</i> . Report to Tweed Shire Council.			~	2010
JWA (2020). Draft Ecological Assessment - Rise Estate, Bilambil Heights (MP 08-0234). A Report to Terranora Group Management Pty Ltd.	~	2020	~	2020
JWA 2023 [#]	~	2023	~	2023
*JWA (2009) incorporates data collected for, and discussed within, JWA (2007). #includes targeted threatened flora and fauna field survey data only (no reporting).				

1.6 The Proposed Modification

Under the current consent, the subject site is approved for Retirement Living (Precinct B), which will remain unchanged. The modification seeks changes to the approved project through removal of the detailed layout to allow for flexibility to adjust the design of the development when a subsequent development application is lodged with Council. Therefore, there are no changes proposed to the approval description, land use, yields or building heights.

The form and scale of development, as approved, will continue to be:

- Land Use: Retirement Living;
- Dwelling yield: 195 dwellings; and
- Maximum building height: 13.6 m / 4 storeys.

2 DESKTOP ASSESSMENT

2.1 Introduction

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

- State and commonwealth databases;
- Commonwealth legislation;
- NSW plans, policies and legislation;
- TSC 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 Commonwealth EPBC Act that may occur within 10 km of the subject site:

- World heritage and national heritage areas;
- Wetlands of international significance (Ramsar wetlands);
- 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 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.

As previously discussed, the repealed TSC Act continues to apply however, under the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*, the following provision applies:





0

Scale 1 : 6000 SCALE: 1:6000 @ A3 200m 300m 100m

PROJECT Ecological Assessment Lot 32 on DP1085109 Marana Street, Bilambil Heights NSW Tweed Shire Council LGA

JWA PTY LTD

Ecological Consultants

Approx. Area	Dwellings/	Ha Potential Dwellings
6	43	257
6.62	29	195
0.47		
10.37	12	129
5.52	14	75
5.93	34	199
4.03	10	39
4.26		
0.24		
I.	22	22
44.44		916
1.15	174	200 beds
77.41		1116
FIGURE	2	TITLE STATE APPRO MASTER PI
PREPARED: BW DATE: 19 December FILE: N21054_EA_202	2024 241219.dwg	- PRECINCT



Subject Site Cadastre

FIGURE 3

TITLE

PREPARED: BW DATE: 19 December 2024 FILE: N21054_EA_20241219.dwg





- R1 General Residential
- B4 Mixed Use
- E2 Environmental Conservation

FIGURE 4

PREPARED: BW DATE: 19 December 2024 FILE: N21054_EA_20241219.dwg

TITLE

LAND ZONING - RISE **BILAMBIL HEIGHTS**

<u>31 New threatened species listings to apply to continued application of former</u> <u>planning provisions</u>

For the purposes of the application of the former planning provisions in accordance with this Part, any change under the new Act to the listings of threatened species and ecological communities is taken to be a corresponding change to the listings under the Threatened Species Conservation Act 1995 referred to in the former planning provisions.

With the above considered, a BioNet database search was used to generate a list of threatened flora and fauna species listed under the 'current' NSW BC Act that may occur within 10 km of the subject site. This search allows inclusion of any new threatened species listed since the TSC Act.

2.2.3 State Government Legislation and Mapping

2.2.3.1 Background

As previously discussed, the below 'repealed' environmental legislation applies to the subject site and therefore were reviewed as part of the desktop assessment:

- State Environmental Planning Policy no. 14 Coastal Wetlands (Coastal Wetlands SEPP);
- State Environmental Planning Policy no. 26 Littoral Rainforest (Littoral Rainforest SEPP); and
- State Environmental Planning Policy no. 71 Coastal Protection (Coastal Protection SEPP).

In addition, the current Chapter 3 of the Biodiversity and Conservation SEPP applies and was assessed as part of this EA.

Further discussion of the relevant legislation is provided in **SECTION 7**.

2.2.4 Local Government Plans and Mapping

Environmental features mapped across the TSC LGA includes flying-fox camps, osprey (*Pandion cristatus*) nests, vegetation communities, drainage lines, and fauna corridors.

The Tweed Coast Comprehensive Koala Plan of Management (TCCKPoM) was adopted by TSC in February 2015 on the back of a Tweed Coast Koala Habitat Study prepared in 2011 (Phillips & Hopkins 2011). On 17 March 2021, the TCCKPoM was approved by the DoPE. In accordance with the objectives of the Koala SEPP 2021 (now Biodiversity and Conservation SEPP) and the approved NSW Koala Recovery Plan, the overarching vision of this Plan is that the Tweed Coast koala population will be recovered to more sustainable levels over the next two decades. The TCCKPoM was reviewed as part of the desktop assessment.

2.3 Results

2.3.1 Database Searches

2.3.1.1 World or National Heritage Properties

No World or National heritage properties listed under the EPBC Act occur on or within 10 km of the subject site.

2.3.1.2 Wetlands of International Significance (Ramsar Wetlands)

No wetlands of international significance (Ramsar wetlands) occur on or within 10 km of the subject site.

2.3.1.3 Threatened Ecological Communities (TECs)

Database searches using the Commonwealth PMST revealed that eight (8) TECs listed under the EPBC Act may occur within 10 km of the subject site:

- Coastal Swamp oak (*Casuarina glauca*) forest of NSW and South East Queensland (SEQ) ecological community Endangered;
- Coastal swamp sclerophyll forest of NSW and SEQ Endangered;
- Dunn's white gum (*Eucalyptus dunnii*) moist forest in north-east NSW and SEQ Endangered;
- Grey box-grey gum wet forest of subtropical eastern Australia Endangered;
- Littoral rainforest and coastal vine thickets of eastern Australia Critically Endangered;
- Lowland rainforest of subtropical Australia Critically Endangered;
- Subtropical and temperate coastal saltmarsh Vulnerable; and
- Subtropical eucalypt floodplain forest and woodland of the NSW North Coast and SEQ bioregions Endangered.

2.3.1.4 Threatened Flora Species

Threatened flora species identified in the database searches are listed in **TABLE 2**. The conservation status of each species is shown in accordance with the EPBC Act and *BC Act*.

TABLE 2DATABASE RECORDS OF THE THREATENED FLORA SPECIESWITHIN 10 KM OF THE SUBJECT SITE

Scientific Name	Common Name	BC Act	EPBC Act
		ALL	ALL
Acacia bakeri	Marblewood	V	
Acalypha eremorum	Acalypha	E	
Acronychia littoralis	Scented acronychia	E	E
Archidendron hendersonii	White lace flower	V	

Scientific Name	Common Name		EPBC
	Common Name	Act	Act
Arthraxon hispidus	Hairy-joint grass	V	V
Baloghia marmorata	Jointed baloghia	V	V
Bosistoa transversa	Yellow satinheart	V	V
Bulbophyllum globuliforme	Miniature moss-orchid	V	V
Cassia marksiana	Brush cassia	E	
Coatesia paniculata	Axe-breaker	E	
Corokia whiteana	Corokia	E	E
Cryptocarya foetida	Stinking cryptocarya	V	V
Cryptostylis hunteriana	Leafless tongue-orchid	V	V
Cynanchum elegans	White-flowered wax plant		E
Cupaniopsis serrata	Smooth tuckeroo	E	
Davidsonia jerseyana	Davidson's plum	E	E
Davidsonia johnsonii	Smooth davidsonia	E	E
Diospyros mabacea	Red-fruited ebony	E	E
Diospyros yandina	Shiny-leaved ebony	E	
Diploglottis campbellii	Small-leaved tamarind	E	E
Dipteracanthus australasicus subsp.		F	
corynothecus		E	
Drynaria rigidula	Basket fern	E	
Endiandra floydii	Floyd's walnut	E	E
Endiandra hayesii	Rusty rose walnut	V	V
Endiandra muelleri subsp. bracteata	Green-leaved rose walnut	E	
Floydia praealta	Ball nut	V	V
Fontainea australis	Southern fontainea	V	V
Geodorum densiflorum	Pink nodding orchid	E	
Gossia fragrantissima	Sweet myrtle	E	E
Grevillea hilliana	White yiel yiel	E	
Harneiria hygropholoides	Native justica	E	
Hicksbeachia pinnatifolia	Red bopple nut	V	V
Isoglossa eranthemoides	Isoglossa	E	
Leichhardtia longiloba	Clear milluine	Б	V
(listed as Marsdenia longiloba)		E	v
Lepiderema pulchella	Fine-leaved tuckeroo	V	
Lepidium peregrinum	Wandering pepper-cress	E	E
Lindsaea brachypoda	Short-footed screw fern	E	
Lindsaea fraseri	Fraser's screw fern	E	
Macadamia integrifolia	Macadamia nut		V
Macadamia tetraphylla	Rough-shelled bush nut	V	V
Niemeyera whitei	Rusty plum	V	
Ochrosia moorei	Southern ochrosia	E	E
Owenia cepiodora	Onionwood	V	V
Peristeranthus hillii	Brown fairy-chain orchid	V	
Phaius australis	Lesser swamp-orchid	E	E
Plectranthus nitidus	Nightcap plectranthus	E	E
Randia moorei	Spiny gardenia	E	E
Rhodamnia maideniana	Smooth scrub turpentine	CE	CE
Rhodamnia rubescens	Scrub turpentine	CE	CE
Rhodomyrtus psidioides	Native guava	CE	CE

Scientific Name	Common Name		EPBC	
Sciencific Name			Act	
Samadera bidwillii	Quassia		V	
Sarcochilus fitzgeraldii	Ravine orchid	۷	V	
Selaginella andrewsii	Tallebudgera spikemoss		V	
Sophora fraseri	Brush sophora	٧	V	
Symplocos baeuerlenii	Small-leaved hazelwood	۷	V	
Syzygium hodgkinsoniae	Red lilly pilly	۷	V	
Syzygium moorei	Durobby	۷	V	
Thesium australe	Austral toadflax	۷	V	
Tinospora tinosporoides	Arrow-head vine	۷		
Vincetoxicum woolsii		F	F	
(listed as Tylophora woollsii)		E	E	
Westringia rupicola			V	
BC Act - New South Wales Biodiversity Conservation Act 2016				

EPBC Act - Commonwealth Environment Protection Biodiversity and Conservation Act 1999

Conservation status: CE - Critically endangered; E - Endangered; V - Vulnerable; NT - Near threatened

2.3.1.5 <u>Threatened Fauna Species</u>

Threatened fauna species identified in the database searches are listed in **TABLE 3**. The conservation status of each species is shown in accordance with the EPBC Act and BC Act. Species that will clearly not occur on the subject site have been omitted (i.e. whales, dolphins, sharks, marine turtles, water mouse, and bird species that rely heavily on coastal / marine / natural wetland environments).

TABLE 3
DATABASE RECORDS OF THREATENED FAUNA SPECIES
WITHIN 10 KM OF THE SUBJECT SITE

Scientific Name	Common Namo	BC	EPBC
Scientific Name	Common Name	Act	Act
Amphibians			
Assa darlingtoni	Pouched frog	V	V
Crinia tinnula	Wallum froglet	V	
Litoria olongburensis	Wallum sedge frog	V	V
Mixophyes balbus	Stuttering frog	E	V
Mixophyes fleayi	Fleay's frog	E	E
Mixophyes iteratus	Giant barred frog	E	V
Birds			
Anthochaera phrygia	Regent honeyeater	CE	CE
Burhinus grallarius	Bush stone-curlew	E	
Calyptorhynchus lathami	Glossy-black cockatoo	V	V
Carterornis leucotis	White-eared monarch	V	
Climacteris picumnus victoriae	Brown treecreeper	V	V
Coracina lineata	Barred cuckoo-shrike	V	
Cyclopsitta diophthalma coxeni	Coxen's fig-parrot	CE	E
Daphoenositta chrysoptera	Varied sittella	V	

Scientific Name	Common Name		EPBC
		Act	Act
Erythrotriorchis radiatus	Red goshawk	CE	V
Falco hypoleucos	Grey falcon	E	V
Falco subniger	Black falcon	V	
Geophaps scripta scripta	Squatter pigeon		V
Glossopsitta pusilla	Little lorikeet	V	
Haliaeetus leucogaster	White-bellied sea-eagle	V	
Hieraaetus morphnoides	Little eagle	V	
Hirundapus caudacutus	White-throated needletail		V
Lathamus discolor	Swift parrot	Е	CE
Lophoictinia isura	Square-tailed kite	V	
Ninox connivens	Barking owl	V	
Ninox strenua	Powerful owl	V	
Pandion cristatus	Eastern osprey	V	
Petroica boodang	Scarlet robin	V	
Ptilinopus magnificus	Wompoo fruit-dove	V	
Ptilinopus regina	Rose-crowned fruit-dove	V	
Ptilinopus superbus	Superb fruit-dove	V	
Stagonopleura quttata	Diamond firetail		V
Turnix melanogaster	Black-breasted button quail	CE	V
Tyto longimembris	Eastern grass owl	V	
Tyto novaehollandiae	Masked owl	V	
Tyto tenebricosa	Sooty owl	V	
Invertebrates			1
Argynnis hyperbius inconstans	Australian fritillary		CE
Phyllodes imperialis smithersi	Pink underwing moth	E	E
Thersites mitchellae	Mitchell's rainforest snail	E	CE
Mammals			
Chalinolobus dwyeri	Large-eared pied bat		V
Chalinolobus nigrogriseus	Hoary wattled bat	V	
Dasyurus maculatus	Spotted-tailed quoll	V	E
Micronomus norfolkensis	Eastern freetail-bat	V	
Miniopterus australis	Little bentwing bat	V	
Miniopterus orianae oceanensis	Large bentwing bat	V	
Myotis macropus	Southern myotis	V	
Nyctimene robinsoni	Eastern tube-nosed bat	V	
Nyctophilus bifax	Eastern long-eared bat	V	
Notamacropus parma	Parma wallaby		V
Ozimops lumsdenae	Northern free-tailed bat	V	
Petauroides volans	Greater glider	E	E
Petaurus australis	Yellow-bellied glider	V	V
Petaurus norfolcensis	Squirrel glider	V	
Petrogale penicillata	Brush-tailed rock-wallaby		V
Phascolarctos cinereus	Koala	E	Е
Planigale maculata	Common planigale	V	
Potorous tridactylus	Long-nosed potoroo	V	V
Pseudomys novaehollandiae	New Holland mouse		V
Pteropus poliocephalus	Grey-headed flying fox	V	V
Saccolaimus flaviventris	Yellow-bellied sheathtail-bat	V	

Scientific Name	Common Name	BC Act	EPBC Act	
Syconycteris australis	Common blossom-bat	V		
Reptiles				
Coeranoscincus reticulatus Three-toed snake-tooth skink V		V		
Delma torquata	Collared delma		V	
Furina dunmalliDunmall's snakeV				
BC Act - New South Wales <i>Biodiversity Conservation Act 2016</i> EPBC Act - Commonwealth <i>Environment Protection Biodiversity and Conservation Act 1999</i> CE - Critically Endangered, E - Endangered, V - Vulnerable				

2.3.1.6 Migratory Species

Migratory species identified in database searches are listed in **TABLE 4**. Species that will clearly not rely on habitat available on the subject site have been omitted (e.g., cetaceans, sea turtles, and marine/shore/oceanic birds). Species that will clearly not occur on the subject site have been omitted (i.e. whales, dolphins, sharks, marine turtles, and bird species that rely heavily on coastal / marine / natural wetland environments).

TABLE 4 DATABASE RECORDS OF COMMONWEALTH LISTED MIGRATORY SPECIES WITHIN 10 KM OF THE SUBJECT SITE

Scientific Name	Common Name	EPBC Act
Cuculus optatus	Oriental cuckoo	Μ
Hirundapus caudacutus	White-throated needletail	M, V
Monarcha melanopsis	Black-faced monarch	Μ
Motacilla flava	Yellow wagtail	Μ
Myiagra cyanoleuca	Satin flycatcher	Μ
Pandion haliaetus	Osprey	Μ
Rhipidura rufifrons	Rufous fantail	Μ
Symposiachrus trivirgatus	Spectacled monarch	Μ
EPBC Act - Commonwealth <i>Environment Protection Biodiversity and Conservation Act 1999</i> CE - Critically Endangered, E - Endangered, V - Vulnerable, M - Migratory		

2.3.2 State Government Legislation and Mapping

2.3.2.1 Coastal Wetlands SEPP

The subject site is not mapped as containing coastal values under the Coastal Wetland SEPP (No. 14).

2.3.2.2 Littoral Rainforest SEPP

The subject site is not mapped as containing SEPP 26 Littoral Rainforest.

2.3.2.3 Biodiversity and Conservation SEPP

The subject site is greater than 1 ha in size and located within the Tweed LGA. As a result, the Biodiversity and Conservation SEPP applies. This is further discussed in **SECTION 7.6**.

2.3.3 Local Government Mapping

2.3.3.1 <u>Tweed Environmental Mapping</u>

The following TSC environmental layers are mapped on the subject site:

- Highly modified and disturbed vegetation community (FIGURE 5a);
- Subregional fauna corridor (FIGURE 5b); and
- One (1) drainage line (FIGURE 5a).

An Osprey nest is located \sim 1.2 km to the south of the subject site along the Tweed River, and an active flying-fox roost is located \sim 2.8 km to the north-east.

2.3.3.2 <u>Tweed Koala Mapping</u>

The subject site is mapped in the Tweed Heads Koala Management Area (Tweed Heads KMA); but is not mapped as part of a Koala Activity Precinct (KAP) or Koala Linkage Precinct (KLP). No Preferred Koala Habitat (PKH) is mapped on the subject site (**FIGURE 5c**).



		Scale 1	: 2500		
		1			
0	20m	40m	60m	80m	100m

SOURCE: Tweed Shire Council Interactive Mapping - Environmental Mapping (accessed 22/09/23)
SCALE: 1:2500 @ A3
JWA PTY LTD Ecological Consultants

PROJECT Ecological Assessment Lot 32 on DP1085109 Marana Street, Bilambil Heights NSW Tweed Shire Council LGA



Drainage line
<u>TSC Vegetation Mapping 2009</u>

Highly Modified / Disturbed - Substantially Cleared of Native Vegetation Highly Modified / Disturbed - Camphor Laurel Dominant Closed to Open Forest

Miscellaneous Map Units - Not Assessed

FIGURE 5A
PREPARED: BW DATE: 19 December 2024 FILE: N21054_EA_20241219.dwg

TITLE

TSC VEGETATION MAPPING 2009 & DRAINAGE LINES



		Scale 1	: 10 000		
0	100m	200m	300m	400m	500m

SOURCE: Tweed Shire Council Interactive Mapping - Environmental Mapping	CLIENT GemLife
(accessed 22/09/23)	PROJEC
SCALE: 1:10 000 @ A3	Ecologic
JWA PTY LTD Ecological Consultants	Lot 32 or Marana

GemLife PROJECT Ecological Assessment Lot 32 on DP1085109 Marana Street, Bilambil Heights NSW Tweed Shire Council LGA

LEGEND Subject Site TSC Fauna Corridors Regional Corridor Subregional Corridor

FIGURE 5B	TITLE
PREPARED: BW DATE: 19 December 2024 FILE: N21054_EA_20241219.dwg	CORRIDORS



		Scale 1	: 10 000			
		1				
0	100m	200m	300m	400m	500m	

OURCE: Tweed Shire Council Interactive apping - Environmental Mapping	CLIENT GemLife				
ccessed 22/09/23)	PROJECT				
CALE: 1:10 000 @ A3	Ecological Assessment				
JWA PTY LTD Ecological Consultants	Lot 32 on DP1085109 Marana Street, Bilambil Heights NSW Tweed Shire Council LGA				

+

Subject Site
<u>TSC Indicative Preferred Koala Habitat</u>
Preferred Koala Habitat - Indicative Only

FIGURE 5C	IIILE TSC INIDICATIVE
PREPARED: BW DATE: 19 December 2024 FILE: N21054_EA_20241219.dwg	PREFERRED KOALA HABITAT

3 FIELD ASSESSMENT

3.1 Introduction

This section discusses the methods and results of the most recent field assessment completed on the subject site by one (1) Ecologist on the 28th March 2023. Findings from previous field assessment identified in **TABLE 1** have been discussed where relevant.

3.2 Methods

3.2.1 Flora Assessment

Due to the relatively small impact areas, the random meander technique (Cropper 1993) was used to complete targeted searches for threatened flora species listed in **TABLE 2**.

Preliminary identification of the vegetation on the subject site was undertaken prior to the commencement of fieldwork via interpretation of aerial photographs and previous flora assessments. To validate current mapping, vegetation communities were investigated across the subject site.

3.2.2 Fauna Assessment

During vegetation surveys the subject site was assessed to determine habitat value for native fauna species (see **SECTION 4**). Any logs, sheets of tin, cardboard, bark and leaves were overturned in search of reptiles and amphibians while traversing the subject site. Searches were undertaken for diggings, scats (including the Koala), and bones. Active observation of bird and amphibian activity, both aurally and visually, was undertaken during the field assessment.

3.3 Results

3.3.1 Flora

No threatened flora species listed within schedules of the EPBC Act or the BC Act have been recorded on the subject site during previous and recent targeted field assessments.

3.3.2 Vegetation Zones (VZs)

The subject site does not represent an intact vegetation community provides no conservation significance and limited ecological value. Instead, the subject site can be categorised into two (2) broad VZs.

3.3.2.1 Vegetation Zone 1

Due to historical clearing and ongoing management, most of the subject site is comprised of cleared and managed grassland with scattered native trees (PLATES 1-6; FIGURE 6 & 7).



Scale 1 : 2500						
	 20m	40m	60m	80m	 100m	
Ũ	2011	Tom	com	oom	100111	

SOURCE: JWA Site Investigations; Metro Map Aerial dated 22/07/23				
SCALE:	1:2500 @ A3			
	JWA PTY LTD Ecological Consultants			

GemLife PROJECT Ecological Assessment Lot 32 on DP1085109 Marana Street, Bilambil Heights NSW Tweed Shire Council LGA

Surveyed TreesSubject Site

FIGURE 6

PREPARED: BW DATE: 19 December 2024 FILE: N21054_EA_20241219.dwg







)m

Metro Map Aerial dated 22/07/23				
SCALE:	1:2500 @ A3			
	JWA PTY LTD Ecological Consultants			

PROJECT Ecological Assessment Lot 32 on DP1085109 Marana Street, Bilambil Heights NSW Tweed Shire Council LGA

Subject Site

- VZ1 Cleared and managed grassland with scattered trees
- VZ2 Exotic / native shrubs or trees or landscape / garden plants

	וחר	
IGL	IKE	

7

TITLE

PREPARED: BW DATE: 19 December 2024 FILE: N21054_EA_20241219.dwg



Mature tree species remaining include Spotted gum (*Corymbia citriodora*), Grey box (*Eucalyptus moluccana*), Forest red gum (*E. tereticornis*), and Swamp mahogany (*E. Robusta*) in the far western extent (**PLATE 3**). A large Fig species remains on the subject site (**PLATE 4**), which is proposed to be retained and used as a feature tree in future development.

Throughout central and eastern portions of the subject site, scattered species include Kauri pine (*Agathis robusta*), Tulipwood (*Harpullia pendula*), Spotted gum, Grey gum (*E. propinqua*), Broad-leaved paperbark (*Melalueca quinquenervia*), and Pricky-leaved tea tree (*M. Styphyelioides*).



PLATE 1



PLATE 2



PLATE 3



PLATE 4



PLATE 5



PLATE 6

3.3.2.2 <u>Vegetation Zone 2</u>

Four (4) areas along the boundary of the subject site are comprised of exotic and native shrubs / trees or garden variety species that occur most likely because of planting or as escapees behind fringing residential dwellings (PLATES 7-10; FIGURE 7).

Species include (as examples); Acacia sp., Agave* (Agave attenuata), Black tea tree (M. bracteata), Bottlebrush (Callistemon viminalis), Bunya pine (Araucaria bidwillii), Camphor laurel* (Cinnamomum camphora), Cocos palm* (Syagrus romanzoffiana), Jacaranda* (Jacaranda mimosifolia), Leopard tree* (Libidibia ferrea), Silky oak (Grevillea robusta), Tibouchina* (Tibouchina sp.), Yucca* (Yucca aloifolia).

The area in the north-western extent of the subject site is dominated by exotic grasses and shrubs (**PLATE 7**).



PLATE 7



PLATE 8



PLATE 9



PLATE 10

3.3.3 Fauna

No threatened or migratory fauna species have been recorded from the subject site during past and recent field assessments.

Recent field assessment recorded the following species:

- Australian magpie (*Gymnorhina tibicen*)
- Australian white ibis (*Threskiornis moluccus*)
- Bar-shouldered dove (Geopelia humeralis)
- Black-faced cuckoo-shrike (Coracina novaehollandiae)
- Brahminy kite (Halliastur indus)
- Laughing kookaburra (*Dacelo novaeguineae*)
- Magpie-lark (*Grallina cyanoleuca*)
- Masked lapwing (Vanellus miles)
- Noisy minor (Manorina melanocephala)
- Pied butcherbird (*Cracticus nigrogularis*)
- Rainbow lorikeet (Trichoglossus haematodus)
- Tawny grassbird (*Cincloramphus timoriensis*)
- Torresian crow (*Corvus orru*)
- Welcome swallow (*Hirundo neoxena*)
- Whistling kite (*Haliastur sphenurus*)
- Willie wagtail (*Rhipidura leucophrys*)

4 HABITAT SUITABILITY ASSESSMENT

4.1 Background

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

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);
- 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 flora 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

4.2.1 Flora

Given the highly disturbed nature of subject site, threatened plant species have not been recorded during previous and recent surveys, and suitable habitat is absent.

4.2.2 Amphibians

The habitat requirements of most species are strongly influenced by factors such as climate, distance to water bodies, riparian vegetation, hydrological and morphological characteristics of water bodies and the availability of suitable micro-habitat for aestivation and shelter.

Many species that occur within the region lay eggs in or near temporary or permanent water bodies and rely on free water for larval development and metamorphosis. Of these species, a few are dependent on forested habitats beyond the riparian zone or beyond areas of temporary inundation. These species include the Red-eyed tree frog (*Litoria chloris*), Leseuer's frog (*Litoria leseueri*), Fletchers frog (*Lechriodus fletcheri*) and the Barred frogs of the *Mixophyes* genus.

Grasslands, provide suitable habitat for a range of amphibian species, particularly along drainage depressions and soaks. Species commonly encountered in grassland communities include the Common eastern froglet, Eastern sign bearing froglet (*Crinia parinsignifera*), Striped marsh frog (*Limnodynastes peronii*), Spotted grass frog (*Limnodynastes tasmaniensis*), Striped rocket frog (*Litoria nasuta*), and Cane toad* (*Rhinella marina*).

The fragmented and disturbed nature of the vegetation across the subject site is likely to limit use to common and disturbance adapted species. No suitable habitat is available for the threatened frog species listed in TABLE 3. See APPENDIX 2 for detailed habitat suitability assessments.

4.2.3 Birds

The significance of near coastal environments of the NSW Far North Coast and South-East Queensland as over-wintering habitat for migratory birds has been established by many observers and bird banders including Keast (1968), Robertson (1973), Gravatt (1974), Porter (1982) and Robertson and Woodall (1983). These patterns may be attributable to the relatively high winter temperatures and long growing season of this region compared with the rest of south-eastern Australia (Fitzpatrick and Nix 1973; Edwards 1979; Nix 1982).

Many insectivorous birds from higher latitudes and elevation over-winter in the locality. These include species such as the Fantail cuckoo (*Cacomantis flabelliformis*), Sacred kingfisher (*Todiramphus sanctus*), Rainbow bee-eater (*Merops ornatus*), Noisy pitta (*Pitta versicolor*), Tree martin (*Petrochelidon nigricans*), Black-faced cuckoo-shrike (*Coracina novaehollandiae*), Cicada bird (*Coracina tenuirostris*), Golden whistler (*Pachycephala pectoralis*), Rufous whistler (*Pachycephala rufiventris*), Rose robin (*Petroica rosea*), Grey fantail (*Rhipidura albiscapa*), White-throated gerygone (*Gerygone olivacea*), Silvereye (*Zosterops lateralis*), Olive-backed oriole (*Oriolus sagittatus*) and Spangled drongo (*Dicrurus bracteatus*).

Birds such as honeyeaters and lorikeets are Blossom nomads (*ibid*.). These birds move locally in response to variation in the availability of nectar and or pollen, important components in their diet. Porter (1982) highlights the importance of Forest red gum, Broad-leaved paperbark, and Coast banksia for Scaly-breasted (*Trichoglossus chlorolepidotus*) and Rainbow (*Trichoglossus moluccanus*) lorikeets as these species flower during the lorikeet's winter breeding period. A sequence of important nectar bearing plants in the genera Eucalyptus, Banksia, Melaleuca and Callistemon provide a continuity of food for nectarivorous birds.

Studies of bird usage in rainforest remnants by Holmes (1987), Connelly and Specht (1988) and Lott & Duigan (1993) indicate that the diversity and abundance of birds is related to the size of the rainforest patches and their degree of isolation from major areas of native forest. Lott & Duigan (1993) and Howe *et al* (1981) also note that sites with a higher diversity of vegetation and those which are closer to water generally support a greater

diversity of birds. Locally nomadic and migratory rainforest species such as the Wompoo (*Ptilinopus magnificus*), Rose-crowned (*Ptilinopus regina*) and Superb fruit-doves (*Ptilinopus superbus*), Common koel (*Eudynamys orientalis*) and Black-faced cuckoo-shrike are known to use scattered areas of habitat as "stepping-stones" between more intact areas of forest (Date *et al* 1992; Lott & Duigan 1993).

The following species are wide-ranging and cannot be conclusively ruled out as being likely to aerially traverse the area from time-to-time, but are unlikely to rely on resources available on the subject site:

- Grey falcon (*Falco hypoleucos*)
- Osprey (Pandion haliaetus);
- White-bellied sea-eagle (*Haliaeetus leucogaster*); and
- White-throated needletail (*Hirundapus caudacutus*).

The subject site does not contain suitable large nest hollows or dry eucalypt forest or woodland for the Masked owl (*Tyto novaehollandiae*); however, scattered trees and forest edges alongside cleared areas may be used for foraging by the individuals if they are occupying surrounding areas.

Although considered much less likely, it cannot be conclusively ruled out that scattered mature trees 'may' provide limited forage resources on the subject site for the Little lorikeet (*Glossopsitta pusilla*).

Although many threatened bird species are considered likely residents of the broader landscape, the subject site provides little to no habitat of importance to the survival of any species listed in TABLE 3. With this considered, the continued use of the surrounding landscape by these species will not be impacted by the proposed modification and any subsequent development. See APPENDIX 2 for detailed habitat suitability assessments.

4.2.4 Invertebrates

The subject site does not contain suitable habitat to support any of the threatened invertebrates listed in TABLE 3. See APPENDIX 2 for detailed habitat suitability assessments.

4.2.5 Mammals

Small terrestrial mammals generally occur in highest densities in association with complex vegetation structures. A dense understorey layer, which provides shelter from predators and provides nesting opportunities, is particularly important. In general, medium-large terrestrial mammals such as macropods select habitats which provide a dense cover for shelter and refuge and open areas for feeding. The larger species tend to occupy drier more open habitats: the smaller species, moister and more densely vegetated habitats.

Arboreal mammals that occur in the region (apart from the koala) utilise tree hollows for nesting and shelter (although the common ringtail possum *Pseudocheirus peregrinus* is not

dependent on hollows). Smith and Lindenmeyer (1988) consider that shortage of nest hollows is likely to limit arboreal mammal populations where density of hollow bearing trees is less than 2 to 8 trees per hectare.

Arboreal folivores are widespread and abundant but exhibit local variation in response to such factors as tree species composition, foliage protein and fibre levels, leaf toughness, toxins, forest structure and the availability of shelter sites. Arboreal folivores are expected to be most abundant in areas of high productivity, high soil fertility and moderate climate, in conjunction with adequate shelter and suitable foraging substrate.

Arboreal nectarivore/insectivores feed on a wide variety of plant and insect exudates including the nectar of flowering eucalypts, and shrubs such as Banksia and Acacia sp. These species also feed extensively on insects, particularly under the shedding bark of eucalypts. The distribution of nectarivore/insectivores is considered to be related to the abundance of nectar and pollen producing plants, the abundance of bark shedding eucalypts which harbour insect prey, and the occurrence of sap and gum exudate producing trees and shrubs (*e.g.* Acacia sp.). Arboreal nectarivores and insectivores are generally hollow dependent species.

Cleared grasslands provide suitable habitat for native terrestrial mammals such as Kangaroos and Wallabies. Notwithstanding, the small number of scattered mature trees, predominately in the far western extent, provide the only potential habitat for threatened species.

These scattered trees provide potential forage habitat for the Squirrel glider (*Petaurus norfolcensis*) and comprise the following preferred koala food trees (PKFTs):

- Forest red gum (Eucalyptus tereticornis);
- Grey box (*E. moluccana*); and
- Grey gum (*E. propinqua*.

Notwithstanding the above, the extent of this habitat is limited to less than five (5) scattered trees, mainly in the far western extent. The value of this habitat is considered negligible for the ongoing survival of these species in the surrounding landscape.

Scattered flowering and fruiting trees across the subject site provide forage habitat for the Grey-headed flying fox (*Pteropus poliocephalus*). Notwithstanding this, the loss of any of these trees will be negligible given the wide-spread availability across the broader landscape. The Yellow-bellied sheathtail bat (*Saccolaimus flaviventris*) has a broad habitat preference that includes cleared areas. Although, it is considered unlikely that this species would roost on the subject site, it cannot be conclusively ruled out from traversing while foraging. Notwithstanding, both species will continue to utilise habitat in the area and across the subject site despite the proposed modification and any subsequent development.

The only habitat providing any value to threatened mammals is scattered mature trees. With this considered, the loss these trees would not result in a negative impact to these
species, and their use of the surrounding landscape will continue unimpeded. See **APPENDIX 2** for detailed habitat suitability assessments.

4.2.6 Reptiles

The quality of habitat for reptiles is strongly influenced by the structural characteristics of vegetation (e.g. complexity of vegetation density and vertical strata) and ground cover (e.g. woody debris and rocky outcrops) which influence microclimate, solar irradiance and the availability of suitable basking and shelter sites (Garden et al. 2007).

Because only a few Australian reptile species are frugivorous, omnivorous or herbivorous (Dubas and Bull 1991), the nutritional composition of vegetation and vegetation species are less important than the structural features (e.g. basking sites, hollows, leaf litter) that a vegetation community can provide (Garden et al 2007).

The subject site provides suitable habitat for native and commonly occurring reptile species; however, an absence of preferred habitat and/or microhabitat features means it is highly unlikely that the subject site supports any of the threatened reptile species listed in TABLE 3 (see APPENDIX 2 for habitat suitability assessments).

4.3 Summary

Based on field and habitat suitability assessments, and excluding those species that may only traverse the subject site from time-to-time, six (6) threatened species cannot be conclusively ruled out from being possible occurrences based on the presence of limited habitat (see **APPENDIX 2** for habitat suitability assessments). These species include:

- Grey-headed flying-fox;
- Koala;
- Little lorikeet;
- Masked owl;
- Squirrel glider; and
- Yellow-bellied sheathtail bat.

5 CORRIDORS AND CONNECTIVITY

5.1 Background

The term 'connectivity' is used to describe the degree to which the landscape facilitates or impedes the movement of species among habitat areas (Bélisle 2005). The level of connectivity between habitat areas in the landscape can be described along a (high - medium - low - isolated) continuum.

Landscapes with high levels of connectivity form an unbroken expanse of habitat through which a wide range of the fauna species can easily move to or between high quality areas. Landscapes with low levels of connectivity are characterised by habitat areas that are bisected by wide gaps, and where the quality and quantity of remaining habitat is reduced (habitat fragmentation). Habitat fragmentation impedes the movement of species among remaining suitable habitat areas (Andrén 1994; Fahrig 2003) and generally restricts movement and increases threats to all but the most mobile of species.

At a broad landscape scale, maintaining habitat connectivity is necessary to maintain the long-term viability of species populations (Beier and Noss 1998). In fragmented landscapes, corridors of native vegetation (ecological corridors) can enhance landscape connectivity by providing habitat for a range of species and facilitating safe movement between larger, more suitable habitat areas.

Three (3) broad types of corridors can be distinguished. These are:

- <u>Linear corridors</u> long, uninterrupted strips of vegetation, such as hedges, strips of forest, and the vegetation growing on banks of rivers and streams;
- <u>Steppingstone corridors</u> a series of small, non-connected habitats that are used to find shelter, food, or to rest; and
- <u>Landscape corridors</u> diverse, uninterrupted landscape elements that provide sufficient cover for safe movement from one core area to another.

5.2 Applicability to the Subject Site

The subject site is mapped as being part of a subregional corridor under the TSC LEP (FIGURE 7b). Notwithstanding this, this mapped corridor clearly contains a paucity of natural features (i.e. intact vegetation) and the northern and southern boundaries of the subject site are fringed by residential dwellings and roads. These factors remove the viability of the mapped corridor to the extent that it is not considered functional.

6 IMPACTS AND AMELIORATION

6.1 Introduction

The following sections examine the likely direct and indirect impacts of the proposed modification and any subsequent development and recommends amelioration measures to minimise and mitigate impacts on the biodiversity and habitat values of the subject site.

6.2 Potential Impacts

6.2.1 Vegetation Clearing

With the exception of the large Fig tree (Tree 15; FIGURE 6; PLATE 4), it is expected that the entire site will be cleared to accommodate the proposed modification and any subsequent development. This includes 24 native, mature trees (FIGURE 8; APPENDIX 1) and four (4) areas comprised of exotic and native shrubs / trees or landscape plants that occur most likely because of planting behind fringing residential dwellings (PLATES 7-10; FIGURE 9).

Impacts that may occur due to the removal of vegetation from the subject site if appropriate amelioration measures are not implemented include:

- A minor reduction in the size and area of habitats available for the dispersal and recruitment of native flora species;
- Greater opportunities for weeds to colonise the subject site and adjacent vegetation via introduction in construction materials and/or vehicles;
- A minor decrease in organic material and biomass;
- Disturbance to the soil structure and integrity, which has the potential reduce the health and longevity of adjacent areas of remaining vegetation;
- Potential for injury, displacement, or death of fauna;
- Minor removal of food sources, shelter, and other habitat attributes important for fauna.

6.2.2 Impacts on Threatened Flora

No threatened flora species have been recorded on the subject site, and it is considered unlikely that there would be any significant impacts on species listed in TABLE 2 or their potential habitat across the surrounding landscape.

6.2.3 Threatened and/or Native Fauna

The proposed modification and any subsequent development will result in some minor loss of grassland foraging habitat for common and urban adapted native fauna occurring in the locality. In addition, the removal any mature trees may provide a potential but limited forage resource for the Grey-headed flying-fox, Koala, Little lorikeet, Masked owl, Squirrel glider, and Yellow-bellied sheathtail bat. This loss may have the following impacts:

- Minor loss of forage habitat for grazing fauna species.
- Animals may be killed or injured during the clearance of vegetation.
- Increased light, noise and activity may cause reclusive species to move away from habitat edges;
- The proposed works will result in an increase in traffic on and to the subject site. This increases the likelihood of animals being killed or injured by vehicles.

Despite the above, there is no evidence to suggest that there would be an impact on habitat critical to the survival of threatened species present, or likely to be present, in the locality. As a result, no impacts on threatened fauna species are expected and general amelioration measures for fauna are considered sufficient (SECTION 6.3.5 refers).

6.2.4 Impacts on Drainage Lines

One (1) drainage line is mapped on the subject site which extends approximately 50 m into the north-western portion of the subject site. This drainage line extends approximately 200 m through a new residential estate and McAllisters Road and given this alignment it is considered to have very limited ecological function.

6.3 Amelioration

6.3.1 Vegetation Clearing

The proposed modification and any subsequent development will result in the loss of 24 scattered native trees. The following amelioration measures are recommended to minimise indirect impacts to any adjacent retained vegetation:

- Any landscape plantings should utilise locally endemic native plant species.
- Weeds should be controlled during construction through vehicle, tool and plant hygiene measures.
- Weeds should be controlled in landscaped areas and known environmental weeds should be avoided in landscape plantings.
- Appropriate disposal of rubbish and food scraps reduces opportunities for non-native predators and disturbance adapted competitors.

6.3.2 Tree Protection

If deemed necessary, adjacent vegetation should be identified and demarcated prior to the commencement of site preparation works. Tree protection fences shall be installed in accordance with the Australian Standard AS 4970-2009.

Note: This amelioration measure will be crucial for the protection of the large Fig tree proposed to be retained as a feature of any future development (Tree 15; FIGURE 6; PLATE 4).

6.3.3 Habitat Trees

Based on field assessments, potential habitat features were observing in two (2) trees. Habitat trees removed during clearing should be kept whole or in large but manageable sections. These trees should be relocated to the environmental conservation area approximately 800 m to the west to preserve their value as fauna habitat.

Any hollows that are removed will be offset at a minimum of 1:1 offset ratio through the provision of nest boxes. For each hollow or pipe identified in the removed trees, compensation in the form of suitable sized nesting boxes will be installed in retained vegetation within the abovementioned environmental conservation area.

The exact number of nest boxes will be determined post clearing by the fauna spotter catcher / ecologist who is required to accurately document the number of hollows removed. Note is to be made of the sizes and types of hollows removed so to ensure that adequate numbers and types of nest boxes have been provided. The exact type, location and orientation of the nest box is to be determined and the installation by a suitably qualified Ecologist.

It is recommended that the CYPLAS range of nest boxes manufactured by Hollow Log Homes (<u>https://www.hollowloghomes.com/cyplas-range</u>) are utilised on site. CYPLAS boxes are made from 100% recycled, high density polyethylene and QLD Cypress. All boxes come with the Habisure SystemTM ready to be installed, are termite and rot proof, and have a lifespan of 30+ years. The 30+ year lifespan of the CYPLAS range makes these boxes preferable to the Birch Plywood Boxes that only offer a lifespan of 5-10 years.

6.3.4 Amelioration for Threatened Flora

Amelioration measures are therefore not considered necessary for threatened flora.

6.3.5 Amelioration for Fauna

Appropriate fauna management strategies including the use of a spotter-catcher should be implemented during vegetation clearing operations to minimise potential adverse impacts on native fauna. The following amelioration measures should be employed to reduce potential indirect impacts to native fauna species:

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

7 CONSIDERATION OF STATUTORY REQUIREMENTS

7.1 Introduction

This section includes an assessment of the likely impacts of the proposed modification and any subsequent development with regards to relevant commonwealth, state and local legislation as listed in **SECTION 2**.

7.2 EPBC Act (Commonwealth)

7.2.1 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; and
- 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.

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 Climate Change, Energy, the Environment and Water for assessment as to whether the action is a 'controlled action' requiring commonwealth approval for the proposed action. The proposed modification and any subsequent 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.

7.2.2 Declared World Heritage Areas

There are no declared World Heritage areas located on or near the subject site.

7.2.3 Declared Ramsar Wetlands

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

7.2.4 Threatened Ecological Communities (TECs)

7.2.4.1 Significant Impact Criteria

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

- reduce the extent of an ecological community;
- fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;
- adversely affect habitat critical to the survival of an ecological community;
- modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns;
- cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting;
- cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
 - assisting invasive species, that are harmful to the listed ecological community, to become established; or
 - causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community; or
- interfere with the recovery of an ecological community.

7.2.4.2 Applicability to the Subject Site

The subject site does not contain any intact vegetation that could represent a TEC.

7.2.5 Commonwealth Listed Threatened Flora and Fauna Species

7.2.5.1 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.

7.2.5.2 Applicability to the Subject Site

No Commonwealth threatened flora species have been recorded on the subject site.

Two (2) Commonwealth threatened fauna species were considered possible occurrences within the subject site based on the availability of limited, but suitable habitat:

- Grey-headed flying fox (*Pteropus poliocephalus*); and
- Koala (Phascolarctos cinereus);

Given that the proposed works will result in minimal vegetation clearing, it is not expected that any significant impacts (as listed in the criteria above) will occur on populations of any threatened species that may be present on the subject site.

7.2.6 Listed Migratory Species

7.2.6.1 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.

7.2.6.2 Applicability to the subject site

No migratory species listed in **TABLE 4** are considered to utilise habitat on the subject site (see **APPENDIX 2** for habitat suitability assessments). As a result, the proposed modification and any subsequent development is unlikely to impact habitat critical to any migratory species.

7.2.7 Requirement for Commonwealth Referral

Based on the assessment above, a referral under the EPBC Act is <u>not</u> considered necessary. No offsets are required under the Commonwealth *EPBC Act Environmental Offsets Policy* (2012).

7.3 Assessment of Significance (Seven-Part Test)

7.3.1 Background

An Assessment of Significance (7-part test equivalence) has been undertaken for all listed species/EECs recorded on the subject site, including threatened fauna predicted to occur over time (SECTION 4). Potential impacts on threatened species, populations or ecological communities, or their habitats were assessed using the *Threatened Species Assessment Guidelines: The Assessment of Significance* (DECC 2007).

The Assessment of Significance should not be considered a "pass or fail" test as such, but a system allowing proponents to undertake a qualitative analysis of the likely impacts and ultimately whether further assessment needs to be undertaken via a Species Impact Statement. All factors must be considered, and an overall conclusion must be drawn from all factors in combination. Where there is any doubt regarding the likely impacts, or where detailed information is not available, a Species Impact Statement should be prepared.

Mitigating, ameliorative or compensatory measures proposed as part of the action, development or activity should not be considered in determining the degree of the effect on threatened species, populations or ecological communities, unless the measure has been proven successful for that species in a similar situation. In many cases where complex mitigating, ameliorative or compensatory measures are required, such as translocation, bush restoration, purchase of land, further assessment through the Species Impact Statement process is likely to be required.

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.

7.3.2 Endangered Ecological Communities (EECs)

The subject site does not contain any intact vegetation that could represent an EEC.

7.3.3 Flora

No BC Act threatened flora species have been recorded on the subject site, and it is considered unlikely that the proposed modification and any subsequent development would contribute significantly to the threats or lifecycle of any naturally occurring specimens or the local population of this species to the point that it is at risk of extinction.

7.3.4 Fauna

Six (6) threatened fauna species listed under the BC Act were considered possible occurrences within the subject site based on the availability of limited, but suitable habitat:

- Grey-headed flying-fox;
- Koala;
- Little lorikeet;
- Masked owl;
- Squirrel glider; and
- Yellow-bellied sheathtail bat.

The proposed modification and any subsequent development will result in minimal vegetation clearing restricted to scattered trees that are likely to be of minimal value when compared to the context of the broader locality. As a result, it is not expected that any

significant impacts will occur on populations of any threatened species that may be present on the subject site. In accordance with the requirements of Section 5 of the EP&A Act a 'Test of Significance" has been completed for all threatened fauna species that were confirmed on the subject site or considered possible or likely occurrences (APPENDIX 3).

7.3.5 Summary

A '7-Part Test of Significance' (Section 5A of the EP&A Act) has been completed for five (5) threatened fauna species that have been confirmed on or near the subject site, or are considered a possible or likely occurrence based on the presence of suitable habitat.

The assessment concluded that the impacts of the proposed modification and any subsequent development are unlikely to threaten the viability of any local populations of the nominated species/communities and the proposal was not likely to result in a significant impact. A Species Impact Statement is therefore not required.

7.4 Coastal Wetlands SEPP (No. 14)

7.4.1 Background

For the subject site the repealed Coastal Wetlands SEPP (No. 14) applies. The Coastal Wetlands SEPP was saved under the transitional provisions of the Coastal Management SEPP, which are in turn saved by virtue of provisions in the Interpretation Act 1987 despite the repeal of the Coastal Management SEPP by the Resilience and Hazards SEPP.

The Coastal Wetlands SEPP aimed to preserve and protect coastal wetlands in the environmental and economic interest of the State. It did this by defining any development that involves clearing, draining, or filling wetlands, or constructing levees on wetlands to be designated development (EDO 2007).

7.4.2 Applicability to the Subject Site

The proposed modification and any subsequent development will not impact on a mapped SEPP wetland.

7.5 Littoral Rainforest SEPP (No. 26)

7.5.1 Background

For the subject site the repealed Littoral Rainforest SEPP (No. 26) applies (i.e., saved for the same reasons as SEPP 14). The primary purpose of the Littoral Rainforest SEPP was to provide a mechanism for the consideration of applications for development that is likely to damage or destroy littoral rainforest areas with a view to the preservation of those areas in their natural state.

7.5.2 Applicability to the Subject Site

The subject site is not mapped as containing Littoral Rainforest under SEPP 26.

7.6 Biodiversity and Conservation SEPP

7.6.1 Background

At the time the DA was lodged, State Environmental Planning Policy No 44–Koala Habitat Protection (SEPP 44) applied. SEPP 44 was repealed and replaced by the State Environmental Planning Policy (Koala Habitat Protection) 2019 (Koala SEPP 2019) on 1 March 2020.

Clause 15 of Koala SEPP 2019 provided:

A development application made, but not finally determined, before the commencement of this Policy in relation to land to which this Policy applies must be determined as if this Policy had not commenced.

Accordingly, SEPP 44 continued to apply to the DA by reference to clause 15 of Koala SEPP 2019.

The Koala SEPP 2019 was repealed and replaced with the State Environmental Planning Policy (Koala Habitat Protection) 2020 (Koala SEPP 2020) on 30 November 2020. Koala SEPP 2020 did not contain any savings provisions with respect to Koala SEPP 2019 and therefore Koala SEPP 2020 applied to the DA.

While section 5(6) and section 30(2)(d) of the *Interpretation Act 1987* operate to save the transitional provision in Koala SEPP 2019 (i.e. clause 15), the transitional provision is limited to Koala SEPP 2019. That is, it does not apply to later instruments, which must be construed on their own terms. Accordingly, SEPP 44, which was previously saved by clause 15 of Koala SEPP 2019, ceased to be saved upon the repeal of Koala SEPP 2019 and the commencement of Koala SEPP 2020.

On commencement, Koala SEPP 2020 applied to all land located within the Richmond Valley LGA. However, when the State Environmental Planning Policy (Koala Habitat Protection) 2021 (Koala SEPP 2021) commenced on 17 March 2021, a consequential amendment was made to Koala SEPP 2020, which restricted its application to zones RU1, RU2 and RU3.

Notwithstanding the amendment to Koala SEPP 2020, clause 18 of Koala SEPP 2021 provided:

A development application made in relation to land, but not finally determined before this Policy applied to the land, must be determined as if this Policy had not commenced in its application to the land.

Accordingly, the proposed modification and any subsequent development is to be determined as if Koala SEPP 2021 had not commenced. That is, the version of Koala SEPP 2020 which applies is that immediately prior to the introduction of Koala SEPP 2021 on 17 March 2021.

Koala SEPP 2020 and Koala SEPP 2021 were both transferred to the State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP)

on 1 March 2022. The SEPPs were incorporated into Chapters 3 and 4 of the Biodiversity and Conservation SEPP, respectively.

The savings provision from clause 18 of the Koala SEPP 2021 was transferred into section 4.16 of the Biodiversity and Conservation SEPP. The continuation of clause 18 enables regard to be had to the version of Koala SEPP 2020 as in force before the commencement of Koala SEPP 2021, which confirms the application of Chapter 3 of the Biodiversity and Conservation SEPP to the subject site.

7.6.2 Applicability to the Subject Site

Chapter 3 of the Koala Habitat Protection SEPP does not apply because the subject site is zoned as general residential (**FIGURE 4** refers).

7.7 Tweed Coast Comprehensive Koala Plan of Management

7.7.1 Background

The TCCKPoM was prepared by the TSC in January 2015 in accordance with the SEPP 44 (now Biodiversity and Conservation SEPP) and the approved NSW Koala Recovery Plan. The overarching vision of the TCCKPoM is that the Tweed Coast koala population will be recovered to more sustainable levels over the next two decades.

The adoption of the TCCKPoM replaces the requirement under SEPP 44 for developments in the LGA to address koala issues individually (although this option remains subject to Council and State approval) provided the proposal is consistent with the requirements of the TCCKPoM. The adoption of the TCCKPoM does not negate the responsibility of TSC or a proponent considering undertaking a development requiring TSC consent to fully consider whether such an activity is likely to result in a significant effect on a threatened species, population or ecological community or their habitat.

7.7.2 Applicability to the subject site

The subject site is mapped in the Tweed Heads KMA; but is not mapped as part of a KAP or KLP. Further to this, the subject site provides potentially suitable habitat by way of the following PKFTs:

- Forest red gum (*Eucalyptus tereticornis*);
- Grey box (E. moluccana);
- Grey gum (*E. propinqua*); and
- Swamp mahogany (E. Microcorys).

The following key points have also been considered:

• The Atlas of Living Australia contains no records of koalas from within the subject site (accessed 17th December 2024).

- The NSW BioNet database has 140 records of koalas from within 10 km of the subject site over the past three (3) generations (18 years). No records are from within the subject site.
- No evidence of koala habitat use has been recorded from the subject site or surrounding landscape during all prior fauna surveys¹. No evidence was recorded during faecal pellet searches of PKFTs.
- PKFTs on the subject site were originally planted as part of a now disused golf course.
- The Tweed Shire Koala Habitat Study (Biolink 2011) identified that the subject site is not located within an area of generational persistence and of the 26 field sites surveyed east of the Pacific Highway and north of the Tweed River, two (2) sites had evidence of koala activity by way of diagnostic faecal pellets. This includes:
 - $\circ~$ Active sites located approximately 5 km and 3 km to the northeast and south of the subject site, respectively.
 - Approximately nine (9) inactive field sites located closer to the subject site than active sites. Of these, five (5) field sites were located less than 1.5 km from the subject site.

As per the Development Assessment Pathway of the TCCKPoM, the proposed modification and any subsequent development can be considered large-scale in the future urban footprint. As such, the following applies.

Part 5.11 Development in the future urban footprint

i) For the purposes of this Plan, the Future Urban Footprint includes the following areas:

- a) any area of land identified for future urban purposes in a State or Council adopted plan or strategy (e.g. North Coast Regional Plan 2036, Tweed Urban and Land Release Strategy 2009)
- b) any Urban Zoned Land with a total area greater than or equal to twenty-five (25) times the minimum lot size for that zone
- c) any R5 Large Lot Residential zoned land with a total area greater than or equal to five (5) times the minimum lot size for that zone.
- *ii)* Despite (*i*) above the Future Urban Footprint does not include:
 - a) Urban Zoned Land with a total area less than twenty-five (25) times the minimum lot size for that zone
 - b) R5 Large Lot Residential zoned land with a total area less than five (5) times the minimum lot size for that zone.

The definition in (i) and (ii) above seeks to define those undeveloped areas that have been identified for future urban growth. This includes areas that have not yet been

¹ This statement excludes reference to 'old scratches' recorded in 2004. Scratches are not a reliable indicator to confirm koala presence.

appropriately zoned (subclause (i)(a)), areas that have been zoned but remain undeveloped (subclauses (i)(b) and (c)) but does not include areas that have already been developed (clause (ii)).

The subject site is part of a larger approved concept plan and is predominately zoned R1 General Residential with the following objectives under the Major Development SEPP:

(1) The objectives of Zone R1 General Residential are as follows:

- a) to provide for the housing needs of the community,
- b) to provide for a variety of housing types and densities,
- c) to enable other land uses that provide facilities or services to meet the day-today needs of residents.

Considering the above, it is reasonable to assign the subject site as a future urban footprint *area*.

Part 5.11 applies to Development Proposals within the Future Urban Footprint referred to in (i) and (ii) above that is:

- a) within a Koala Activity Precinct
- b) within a Koala Linkage Precinct
- c) elsewhere on the Tweed Coast where koalas are present.

The subject site is not located within a Koala Activity Precinct or Koala Linkage Precinct. Based on the guidelines in the TCCKPoM, (c) applies if the subject site contains 'core koala habitat' (Section 3.4). Assessment of the subject site against the definitions of core koala habitat is provided in **TABLE 8**.

Requirement	Assessment of the subject site
Preferred Koala Habitat within a Koala Activity Precinct	The subject site is not within a Koala Activity Precinct
Preferred Koala Habitat within a Koala Linkage Precinct	The subject site is not within a Koala Linkage Precinct
Preferred Koala Habitat where koalas have been observed in the previous 18 years	There are no confirmed recorded of koalas on the subject site within the past 18 years and there are no records from the subject site in the Atlas of Living Australia or BioNet databases.
	As per the Tweed Shire Koala Habitat Study (Biolink 2011), the subject site was not located within an area of generational persistence.

TABLE 8 ASSESSMENT AGAINST REQUIREMETNS OF THE TCCKPOM

Any other area where koalas are present	No evidence of koala habitat use has been recorded from the subject site or surrounding landscape during all prior fauna surveys. No evidence was recorded during recent faecal pellet
	searches of PKFTs.

Koalas are known to occupy the surrounding landscape; however, habitat on the subject site is limited to planted trees associated cleared and management grasslands. Given suitable habitat is available, it cannot be conclusively ruled out that the Koala occurs on the subject site from time-to-time.

Notwithstanding the above, suitable habitat of the subject site is surrounded by nonpreferred habitat (i.e. rainforest, camphor dominated forest, disturbed grasslands) and resident development. With this considered, use of the subject site is almost certainly restricted to individuals traversing the landscape and is not likely to constitute an important area for long-term Koala persistence across the broader landscape.

Based on historical records, field assessments, and legislative definitions; there is no evidence to suggest that the subject site provides habitat critical for the conservation of koalas on the tweed coast.

With the above considered, the proposed modification and any subsequent development will have no impact to koalas and the development assessment provisions of the TCCKPoM are not considered relevant in this case.

8 SUMMARY AND RECOMMENDATIONS

JWA have been engaged by GemLife to complete an EA for land at Marana Street, Bilambil Heights; otherwise described as Lot 32 on DP1085109. The subject site (6.62 ha) is part of a larger (184 ha) Concept Plan for the area and that was authorised in October 2008 by the Minister for Planning and is contained within the Far North Coast Regional Strategy for Urban Expansion and sections of the proposed Rise residential community at Bilambil Heights.

Under the current consent, the subject site is approved for Retirement Living (Precinct B), which will remain unchanged. The modification seeks changes to the approved project through removal of the detailed layout to allow for flexibility to adjust the design of the development when a subsequent development application is lodged with Council. Therefore, there are no changes proposed to the approval description, land use, yields or building heights.

The subject site does not represent an intact vegetation community and provides no conservation significance and limited ecological value. Due to historical clearing and ongoing management, most of the subject site is comprised of cleared and managed grassland with scattered native trees. Four (4) areas along the boundary of the subject site are comprised of exotic and native shrubs / trees or garden variety species that occur most likely because of planting or as escapees behind fringing residential dwellings. The subject site does not contain any intact vegetation that could represent a TEC, and no threatened flora species have been recorded on the subject site.

Based on field and habitat suitability assessments, and excluding those species that may only traverse the subject site from time-to-time, the following six (6) threatened species cannot be conclusively ruled out from being possible occurrences based on the presence of potentially suitable habitat.

- Grey-headed flying-fox;
- Koala;
- Little lorikeet;
- Masked owl;
- Squirrel glider; and
- Yellw-bellied sheathtail bat.

Notwithstanding the above, the proposed modification and any subsequent development will result in minimal vegetation clearing that is likely to be of minimal value when compared to the context of the broader landscape. With this considered, the subject site provides little to no habitat of importance to the survival of threatened species, and their continued use of the surrounding landscape by these species will not be impacted by the proposed modification and any subsequent development.

It is further anticipated that with the recommended fauna amelioration implemented (i.e., spotter catcher), native vegetation on the subject site can be cleared while ensuring there is no impact on biodiversity.

Given the current degraded nature of the subject site and extent of impacts discussed throughout this EA, it is expected that the proposed modification and any subsequent development will have a negligible impact on native flora and fauna on the Tweed.

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APPENDIX 1 - TREE SURVEY DATA

Tree No.	Common name	Botanical name	Habitat features^	Remove
1	Grey box	Eucalyptus moluccana		\checkmark
2	Spotted gum	Corymbia citriodora		\checkmark
3	Spotted gum	Corymbia citriodora		\checkmark
4	Spotted gum	Corymbia citriodora		\checkmark
5	Swamp mahogany	Eucalyptus robusta		\checkmark
6	Forest red gum	Eucalyptus tereticornis		\checkmark
7	Grey box	Eucalyptus moluccana		\checkmark
8	Spotted gum	Corymbia citriodora		\checkmark
9	Spotted gum	Corymbia citriodora		\checkmark
10	Grey box	Eucalyptus moluccana		\checkmark
11	Forest red gum	Eucalyptus tereticornis	✓	\checkmark
12	Spotted gum	Corymbia citriodora		\checkmark
13	Spotted gum	Corymbia citriodora		√
14	Silky oak	Grevillia robusta	✓	√
15	Fig	Fig species		
16	Broad-leaved paperbark	Melalueca quinquenervia		√
17	Spotted gum	Corymbia citriodora		√
18	Kauri pine	Agathis robusta		\checkmark
19	Tulipwood	Harpullia pendula		\checkmark
20	Kauri pine	Agathis robusta		\checkmark
21	Spotted gum	Corymbia citriodora		\checkmark
22	Spotted gum	Corymbia citriodora		\checkmark
23	Grey gum	Eucalyptus propinqua		\checkmark
24	Spotted gum	Corymbia citriodora		\checkmark
25	Prickly-leaved tea tree	Melalueca styphelioides		\checkmark
^ Habita	t features (e.g., hollows) were	noticeable from the ground.		

APPENDIX 2 - HABITAT SUITABILITY ASSESSMENTS

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence
Amphibians						
Assa darlingtoni	Pouched frog	v		Pouched frogs live in cool, moist rainforest, including Antarctic Beech, or moist eucalypt forest in mountainous areas, mostly above 800 m but have been found as low as 300 m.	There are two (2) records of the Pouched frog from within 10 km of the subject site from the NSW BioNet online database. The subject site is not suitably located in mountainous areas and is well below the elevation recorded for this species (~150-160 m).	Unlikely
Crinia tinnula	Wallum froglet			Wallum froglets are found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. They typically occur in sedgelands and wet heathlands but can also be found along drainage lines within other vegetation communities and disturbed areas, and occasionally in swamp sclerophyll forests. The species breeds in swamps with permanent water as well as shallow ephemeral pools and drainage ditches.	There are 97 records of the Wallum froglet from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available on the subject site.	Unlikely
Litoria olongburensis	Wallum sedge frog	v	V	The Wallum sedge frog is found in ephemeral, seasonal and permanent wetlands with emergent reeds, ferns and/or sedges, in undisturbed coastal wallum swamps. Griffith and colleagues (2003) describe wallum as sandmass heathland and shrubland, and various forest, woodland, sedgeland and	There are 13 records of the Wallum sedge frog from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available on the subject site.	Unlikely

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence				
Amphibians										
				grassland communities (Bantianoff & Elsol 1989; Coaldrake 1961).						
				While most common in swamps, the Wallum sedge frog may also be found around creeks and freshwater lakes in coastal wallum. At swamp sites, the wallum sedge frog can be found sheltering amongst sedges, reeds and ferns all year round (Anstis 2002; Ehmann 1997; Ingram & Corben 1975; James 1996; Lewis & Goldingay 2005; Liem & Ingram 1977; Neilson 2000).						
Mixophyes fleayi	Fleay's frog	E	E	Fleay's frog is associated with montane rainforest (Corben & Ingram 1987) and open forest communities adjoining rainforest (Hines 2001, pers. comm.). The species occurs along stream habitats from first to third order streams (i.e. small streams close to their origin through to permanent streams with grades of 1 in 50) and is not found in ponds or ephemeral pools. Adults may be found in leaf litter and along watercourses in rainforest and adjoining wet sclerophyll forests (Hines & SEQTFRT 2002).	There are no records of the Fleay's frog from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available on the subject site.	Unlikely				
Mixophyes iteratus	Giant barred frog	E	V	Giant barred frogs are found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation. Moist riparian habitats such as rainforest or wet sclerophyll forest are favoured for the deep leaf litter that they	There are no records of the Giant barred frog from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available on the subject site.	Unlikely				

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence					
Amphibians											
				provide for shelter and foraging, as well as open perching sites on the forest floor. However, giant barred frogs will also sometimes occur in other riparian habitats, such as those in drier forest or degraded riparian remnants, and even occasionally around dams.							
Birds	Birds										
Amaurornis moluccana	Pale-vented bush-hen	v		The pale-vented bush-hen inhabits tall dense understorey or ground-layer vegetation on the margins of freshwater streams and natural or artificial wetlands, usually within or bordering rainforest, rainforest remnants or forests.	There are five (5) records of the Pale-vented bush-hen within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available on the subject site.	Unlikely					
Anseranas semipalmata	Magpie goose	v		A waterbird that is mainly found in shallow wetlands, where the depth of water is less than 1 m and dense reeds and rushes are present.	There are nine (9) records of the Magpie goose within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely					
Anthochaera phrygia	Regent honeyeater	CE	CE	The Regent honeyeater is found from Dalby in QLD, south to Bendigo in Victoria, especially along the ranges and the western slopes. Its distribution is extremely patchy with only a small number of known breeding sites. The estimated total population is between 350 and 400 mature individuals. Potential habitat for this species includes dry eucalypt woodland	There are no records of the Regent honeyeater from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely					

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence					
Amphibians											
				and open forest, rural and urban areas with mature eucalypts. It favours ironbark-box associations, mugga ironbark (<i>Eucalyptus</i> <i>sideroxylon</i>), white box (<i>E. albens</i>), and yellow box (<i>E. melliodora</i>). Other habitat includes swamp mahogany (<i>E. robusta</i>), spotted gum (<i>Corymbia maculata</i>), or river she-oak (<i>Casuarina cunninghamiana</i>) with associated needle-leaf mistletoe (<i>Amyema</i> <i>cambagei</i>). This species generally prefers wetter, more fertile sites that are reliable nectar producers (both in timing and quantity), such as creek flats, river valleys and lower slopes (OEH 2014).							
Atrichornis rufescens	Rufous scrub-bird	v	E	Rufous scrub-birds are now confined to high- altitude (above 600 m elevation) subtropical, warm temperate and cool temperate rainforests, and wet sclerophyll forests.	There are no records of the Rufous scrub- bird from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely					
Botaurus poiciloptilus	Australasian bittern		E	The Australasian bittern is widespread but uncommon in south-west and south-east Australia, generally preferring freshwater habitats with tall, dense vegetation with bulrushes and spike rushes.	There are no records of the Australasian bittern within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely					
Burhinus grallarius	Bush stone- curlew	E		Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber.	There are 29 records of the Bush stone- curlew from within 10 km of the subject site from the NSW BioNet online database.	Unlikely					

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence					
Amphibians											
				In the south-east it is either rare or extinct throughout its former range.	No suitable habitat is available in the subject site.						
Calyptorhynchus lathami lathami	Glossy black cockatoo	v	V	This species is associated with woodland or open sclerophyll forests with populations of <i>Allocasuarina</i> , which comprise its exclusive diet. They require large old trees with hollows for nesting.	There is one (1) record of the Glossy-black cockatoo from within 10 km of the subject site from the NSW BioNet online database. This species may traverse the area; however, the subject site contains no suitable habitat.	Unlikely					
Carterornis leucotis	White-eared monarch	v		In NSW, White-eared monarchs occur in rainforest, especially drier types, such as littoral rainforest, as well as wet and dry sclerophyll forests, swamp forest and regrowth forest.	There are 11 records of the White-eared monarch from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely					
Climacteris picumnus victoriae	Brown treecreeper	V		Found in eucalypt woodlands and dry open forest of the inland slopes and plains inland of the Great Dividing Range. This species mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species. It is also found in mallee and River Red Gum (<i>Eucalyptus camaldulensis</i>) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. The Brown treecreeper has been recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. Hollows in standing	There is one (1) record of the Brown treecreeper from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely					

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence					
Amphibians											
				dead or live trees and tree stumps are essential for nesting.							
Coracina lineata	Barred cuckoo- shrike	v		Found in rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses. They are usually seen in pairs or small flocks foraging among foliage of trees for insects and fruit. They are active birds, frequently moving from tree to tree.	There are two (2) records of the Barred cuckoo-shrike from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely					
Cuculus optatus	Oriental cuckoo		м	This species is found in monsoon forests, the edges of rainforests, treed paddocks, mangroves, roadsides, and river flats (Pizzey and Knight 1999).	There are no records of the Oriental cuckoo from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely					
Cyclopsitta diophthalma coxeni	Coxen's fig parrot	CE	E	Usually recorded from drier rainforests and adjacent wetter eucalypt forest but rarely seen due to its small size and cryptic habits. Also found in the wetter lowland rainforests that are now largely cleared in NSW.	There are no records of the Coxen's fig parrot within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely					
Daphoenositta chrysoptera	Varied sittella	V		Varied sitellas are found in eucalypt woodlands and forests throughout their range. They prefer rough-barked trees like stringybarks and ironbarks or mature trees with hollows or dead branches.	There are four (4) records of the Varied sittella from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely					

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence
Amphibians						
Dasyornis brachypterus	Eastern bristlebird	E	E	Habitat for central and southern populations is characterised by dense, low vegetation including heath and open woodland with a heathy understorey. In northern NSW the habitat occurs in open forest with dense tussocky grass understorey and sparse mid- storey near rainforest ecotone; all of these vegetation types are fire prone.	There are no records of the Eastern bristlebird within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Ephippiorhynchus asiaticus	Black-necked stork	E		Floodplain wetlands (swamps, billabongs, watercourses, and dams) of the major coastal rivers are the key habitat in NSW for the Black- necked stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.	There are 38 records of the Black-necked stork from within 10 km of the subject site from the NSW BioNet online database. This species is likely to persist in the region; however, no suitable habitat is available on the subject site.	Unlikely
Erythrotriorchis radiatus	Red goshawk	CE	v	This species occupies open forests and woodlands along rivers and wetlands and rainforest fringes. In NSW favoured habitat includes <i>Melaleuca</i> forest along coastal rivers (Debus 1991, 1993).	There are no records of the Red goshawk from within 10 km of the subject site from the NSW BioNet online database. This species is likely to persist in the region; however, no suitable habitat is available on the subject site.	Unlikely
Falco hypoleucos	Grey falcon	E	v	This species is associated with arid or semi- arid environments, where it can be found in shrublands, grasslands, watercourses, and wetlands.	There are no records of the Grey falcon within 10 km of the subject site from the NSW BioNet online database. This species may traverse the area while foraging; however, the subject site contains no suitable habitat.	Unlikely

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence
Amphibians						
Geophaps scripta	Squatter pigeon	V		Well-draining, gravelly, sandy or loamy soils support the open-forest to woodland communities with patchy, tussock-grassy understories that support the subspecies' foraging and breeding requirements. Given that the subspecies nests in shallow depressions in the ground, it requires well- draining soils. Natural foraging habitat is remnant or regrowth open-forest to sparse, open- woodland or scrub dominated by Eucalyptus, Corymbia, Acacia or Callitris species, on sandy or gravelly soils, within 3 km of a suitable, permanent or seasonal waterbody (Squatter Pigeon Workshop 2011). Breeding habitat occurs on stony rises occurring on sandy or gravelly soils, within 1 km of a suitable, permanent waterbody (Squatter Pigeon Workshop 2011).	There are no records of the Squatter pigeon within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Glossopsitta pusilla	Little lorikeet	v		Forages primarily in the canopy of open eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country (e.g., paddocks, roadside remnants, and urban trees) also help sustain viable populations of the species.	There are three (3) records of the Little lorikeet from within 10 km of the subject site from the NSW BioNet online database. Although considered much less likely, it cannot be conclusively ruled out that scattered trees 'may' provide limited forage resources on the subject site.	Possible

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence				
Amphibians										
Haliaeetus leucogaster	White-bellied sea-eagle	v	м	This species has a large distribution range, and is found in association with coasts, large rivers and estuaries and prefers to nest in large trees adjacent watercourses.	There are 74 records of the White-bellied sea-eagle from within 10 km of the subject site from the NSW BioNet online database. This species may traverse the area while foraging; however, the subject site contains no suitable habitat.	Unlikely				
Hirundapus caudacutus	White-throated needletail		V, M	This species is recorded in all coastal regions of QLD and NSW and almost always forages aerially. Most often, the species is recorded above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland.	There are no records of the White-throated needletail from within 10 km of the subject site from the NSW BioNet online database. This species may traverse the area while foraging; however, the subject site contains no suitable habitat.	Unlikely				
Irediparra gallinacea	Comb-crested jacana	v		Inhabit permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation.	There are 18 records of the Comb-crested jacana from within 10 km of the subject site from the NSW BioNet online database. This species is likely to persist in the region; however, no suitable habitat is available on the subject site.	Unlikely				
Lathamus discolor	Swift parrot	Е	CE	The swift parrot migrates from its Tasmanian breeding grounds to overwinter in the box- ironbark forests and woodlands of Victoria, NSW, and southern QLD.	There are no records of the Swift parrot within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available.	Unlikely				

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence		
Amphibians								
Lichenostomus fasciogularis	Mangrove honeyeater	V		The primary habitat of the species is mangrove woodlands and shrublands but Mangrove Honeyeaters also range into adjacent forests, woodlands and shrublands, including casuarina and paperbark swamp forests and associations dominated by eucalypts or banksias. They occasionally forage in parks and gardens of coastal towns and villages. Mangrove Honeyeaters eat nectar, from flowers, and invertebrates, including marine snails and crabs. They generally forage in mangroves, mainly taking food from among the foliage but also feeding at flowers, and from the trunks and roots. They also sometimes forage among flowering trees and shrubs in adjacent habitats.	There are nine (9) records of the Mangrove honeyeater from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		
Menura alberti	Albert's lyrebird		NT	Mainly occur in the wettest rainforests or wet sclerophyll forests with a wet understorey, often of rainforest plants. Higher densities of Albert's Lyrebirds occur in association with a canopy of eucalypts compared with rainforest lacking eucalypts (for equivalent climate), and in wet sclerophyll forest with greater weights of litter and logs and slower rates of litter decomposition.	There is one (1) records of the Albert's lyrebird within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		
Monarcha melanopsis	Black-faced monarch		м	This species occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll)	There are no records of the Black-faced monarch from within 10 km of the subject site from the NSW BioNet online database.	Unlikely		

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence		
Amphibians								
				rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest. During winter or migration, this species also occurs in marginal habitats such as 20-30 years old regrowth rainforest, nearby open eucalypt forest (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as dry sclerophyll forests and woodlands, often with a patchy understorey.	No suitable habitat is available in the subject site.			
Motacilla flava	Yellow wagtail		м	Inhabits open country near water, such as wet meadows. It nests in tussocks.	There are no records of the Yellow wagtail within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		
Myiagra cyanoleuca	Satin flycatcher		м	This species occurs in heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occurs in coastal forests, woodlands, mangroves and drier woodland and open forests.	There are no records of the Satin flycatcher from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		
Ninox connivens	Barking owl	v		Barking owls are found in open woodlands and the edges of forests, often adjacent to farmland. They are less likely to use the interior of forested habitat. They are usually found in habitats that are dominated by	There is one (1) records of the Barking owl from within 10 km of the subject site from the NSW BioNet online database.	Unlikely		

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence		
Amphibians								
				eucalyptus species, particularly red gum, and, in the tropics, paperbark species. They prefer woodlands and forests with a high density of large trees and particularly sites with hollows that are used by the owls as well as their prey. Roost sites are often located near waterways or wetlands.	No suitable habitat is available in the subject site.			
Pandion cristatus	Eastern osprey	v	м	This species is found in littoral and coastal habitats, occasionally following large watercourses inland. It requires extensive open areas of water for foraging.	There are 172 records of the Eastern osprey from within 10 km of the subject site from the NSW BioNet online database. This species may traverse the area while foraging; however, the subject site contains no suitable habitat.	Unlikely		
Ptilinopus magnificus	Wompoo fruit- dove	v		Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests. Feeds on a diverse range of tree and vine fruits and is locally nomadic - following ripening fruit. Thought to be an effective medium to long-distance vector for seed dispersal.	There are six (6) records of the Wompoo fruit-dove from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		
Ptilinopus regina	Rose-crowned fruit-dove	V		Rose-crowned fruit-doves occur mainly in sub- tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful.	There are 25 records of the Rose-crowned fruit-dove from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence		
Amphibians								
Ptilinopus superbus	Superb Fruit- Dove	v		Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees.	There are four (4) record of the Superb fruit- dove from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		
Todiramphus chloris	Collared kingfisher	v		Collared Kingfishers are virtually restricted to mangrove associations of estuaries, inlets, sheltered bays and islands, and the tidal flats and littoral zone bordering mangroves. They sometimes occur in terrestrial forests or woodlands bordering mangroves, where they will nest in holes in trees or in arboreal termitaria. They are sometimes seen in streets or gardens in built-up areas bordering mangrove vegetation.	There are 11 records of the Collared kingfisher from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		
Rhipidura rufifrons	Rufous fantail		м	In east and south-east Australia, the Rufous fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallowwood (<i>Eucalyptus microcorys</i>), Mountain grey gum (<i>E. cypellocarpa</i>), Narrow- leaved peppermint (<i>E. radiata</i>), Mountain ash (<i>E. regnans</i>), Alpine ash (<i>E. delegatensis</i>), Blackbutt (<i>E. pilularis</i>) or Red mahogany (<i>E. resinifera</i>); usually with a dense shrubby understorey often including ferns. They also occur in subtropical and temperate rainforests; where they are recorded in temperate Lilly pilly (<i>Acmena smithi</i>)	There are no records of the Rufous fantail from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		
Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence		
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Amphibians								
				rainforest, with Grey myrtle (Backhousia myrtifolia), Sassafras (Doryphora sassafras) and Sweet pittosporum (Pittosporum undulatum) subdominants. They occasionally occur in secondary regrowth, following logging or disturbance in forests or rainforests. When on passage, they are sometimes recorded in drier sclerophyll forests and woodlands, including Spotted gum (Eucalyptus maculata), Yellow box (E. melliodora), ironbarks or Stringybarks, often with a shrubby or heath understorey. In north and north-east Australia, they often occur in tropical rainforest and monsoon rainforests, including semi-evergreen mesophyll vine forests, semi-deciduous vine thickets or thickets of Melaleuca spp.				
Symposiachrus trivirgatus	Spectacled monarch		Μ	The Spectacled monarch prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves.	There are no records of the Spectacled monarch from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		
Turnix melanogaster	Black-breasted button quail	CE	V	This species is restricted to areas mostly with 770-1200 mm rainfall per annum. They prefer drier low closed forests, particularly semi- evergreen vine thicket, low microphyll vine forest, Araucarian microphyll vine forest and Araucarian notophyll vine forest. This species may also be found in low, dense acacia thickets and in littoral areas, in vegetation	There are no records of the Black-breasted button quail within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely		

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence
Amphibians						
				behind sand dunes. An extensive dense leaf- litter layer is required for foraging and possibly also roosting. Fallen logs and a dense, heterogeneously distributed shrub layers are also considered to be important habitat characteristics for shelter and breeding.		
Tyto longimembris	Eastern grass owl	v		Eastern grass owls are found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains. They rest by day in a 'form' - a trampled platform in a large tussock or other heavy vegetative growth.	There is one (1) record of the Eastern grass owl from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Tyto novaehollandiae	Masked owl	٧		Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides.	There is are two (2) records of the Masked owl within 10 km of the subject site from the NSW BioNet online database. The subject site does not contain suitable large nest hollows or dry eucalypt forest or woodland; however, forest edges alongside cleared areas may be used for foraging by individuals if they are occupying surrounding areas.	Possible
Tyto tenebricosa	Sooty owl	v		Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests. Roosting occurs in very large hollow of a tall forest tree or in heavy vegetation and deep moist gullies.	There is one (1) record of the Sooty owl from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence
Amphibians						
Invertebrates						
Argynnis hyperbius inconstans	Australian fritillary	E	CE	Restricted to open, swampy, coastal areas where the larval food plant, <i>Viola</i> <i>betonicifolia</i> , grows as a small, ground herb in association with <i>Lomandra longifolia</i> (long leaved matrush) and grasses, especially the grass <i>Imperata cylindrica</i> (blady grass).	There are no records of the Australian fritillary within 10 km of the subject site from the NSW BioNet online database. Required food plant not recorded on the subject site.	Unlikely
Phyllodes imperialis smithersi	Pink underwing moth		E	The Southern pink underwing moth is found in subtropical rainforest below about 600 m elevation.	There are 13 records of the Pink underwing moth within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Thersites mitchellae	Mitchell's rainforest snail	E	CE	Remnant areas of lowland subtropical rainforest and swamp forest on alluvial soils. Slightly higher ground around the edges of wetlands with palms and fig trees are particularly favoured habitat.	There is one (1) record of the Mitchell's rainforest snail within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Mammals						
Chalinolobus dwyeri	Large-eared pied bat	V	V	This species requires a combination of sandstone cliff/escarpment to provide roosting habitat that is adjacent to higher fertility sites, particularly box gum woodlands or river/rainforest corridors that are used for foraging. Almost all records have been found within several kilometres of cliff lines or rocky	There are no records of the Large-eared pied bat within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence
Amphibians						
				terrain. Roosting has also been observed in disused mine shafts, caves, overhangs, and disused fairy martin (<i>Hirundo ariel</i>) nests. The structure of primary nursery roosts appears to be very specific, <i>i.e.</i> arch caves with dome roofs (that need to be deep enough to allow juvenile bats to learn to fly safely inside) and with indentations in the roof (presumably to allow the capture of heat). These physical characteristics are very uncommon in the landscape and therefore a limiting factor to the species distribution.		
Dasyurus maculatus	Spotted-tail quoll	V	E	This species is recorded from a wide range of habitats, including montane rainforests, sclerophyll forests (<i>e.g.</i> open, closed, wet), coastal heathlands, sub-alpine woodlands, and riparian forests. It prefers mature wet forests that have not been logged and require large areas of relatively intact forest for foraging. Preferred den sites include hollow logs, caves, or rocky outcrops for daytime shelter.	There are six (6) records of the Spotted- tailed quoll from within 10 km of the subject site from the NSW BioNet online database. Large contiguous areas of remnant forest to the west means this species is likely to persist in the region. Notwithstanding this, the subject site is too degraded and modified to provide important habitat for the Spotted-tailed quoll.	Unlikely
Miniopterus australis	Little bent- winged bat	V		Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests, and banksia scrub. Generally found in well-timbered areas. Roosting occurs in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings.	There are 53 records of the Little bent- winged bat from within 10 km of the subject site from the NSW BioNet online database. This species may traverse the area while foraging; however, the subject site contains no habitat to be of importance.	Unlikely

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence
Amphibians						
Myotis macropus	Southern myotis	V		The Southern myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. They generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Foraging occurs over streams and pools catching insects and small fish by raking their feet across the water surface.	There are eight (8) records of the Southern myotis from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Notomacropus parma	Parma wallaby		V	Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest. During the day they shelter in dense cover.	There are no records of the Parma wallaby from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Nyctimene robinsoni	Eastern tube- nosed bat	v		Favour streamside habitats within coastal subtropical rainforest and moist eucalypt forests with a well-developed rainforest understorey.	There is one (1) record of the Eastern tube- nosed bat from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Ozimops lumsdenae	Northern free- tailed bat	V		The only confirmed record of this species in NSW is of a colony found in the roof of a house in Murwillumbah, however, calls have been detected from a few other locations in the far north east of the State.	There are 11 records of the Northern free- tailed bat from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence				
Amphibians	Amphibians									
				They prefer a range of vegetation types in northern Australia, from rainforests to open forests and woodlands, and are often recorded along watercourses. Roosts are mainly formed in tree hollows but relatively large colonies have been found under house roofs in urban areas in QLD.						
Petauroides volans	Greater glider	E	E	This species is found in eucalypt forests and woodlands. It prefers forests with a good diversity of eucalypt species to provide consistent forage opportunities year-round, and is found in the greatest abundance in tall, montane, moist old growth forests.	There are no records of the Greater glider from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely				
Petaurus australis	Yellow-bellied glider	v		Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	There are no records of the Yellow-bellied glider from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely				
Petaurus norfolcensis	Squirrel glider	v		The Squirrel glider prefers wet and dry sclerophyll forests and woodlands. The most common vegetation areas where they can be found usually contain one or more species of iron-barked eucalypts and with a shrub midstorey comprising (as examples) regular flowering species such as Acacias and/or Banksias. Roosting occurs in nest hollows, in	There is are 12 record of the Squirrel glider from within 10 km of the subject site from the NSW BioNet online database. It cannot be conclusively ruled out that scattered trees in the far western extent of the subject site 'may' provide limited forage resources. Notwithstanding, this habitat is	Possible				

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence
Amphibians						
				which individuals can utilise multiple over their home-range.	unlikely to be of any importance when compared to the surrounding landscape.	
Petrogale penicillata	Brush-tailed rock-wallaby	E	v	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north.	There are no records of the Brush-tailed rock-wallaby from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Phascolarctos cinereus	Koala	E	E	This species inhabits a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities where suitable food trees are present. The koala is a leaf-eating specialist that feeds primarily during dawn, dusk, or night. Its diet is restricted mainly to foliage of a small selection of preferred <i>Eucalyptus</i> spp.	There are 278 records of the Koala from within 10 km of the subject site from the NSW BioNet online database. Use of the subject site by the Koala is likely to be transitory and focused on a small number of scattered trees in the far western extent of the subject site.	Possible
Planigale maculata	Common planigale	v		Common planigales inhabit rainforest, eucalypt forest, heathland, marshland, grassland, and rocky areas where there is surface cover, and usually close to water. They are active at night and during the day shelter in saucer-shaped nests built in crevices, hollow logs, beneath bark or under rocks.	There are seven (7) records of the Common planigale from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Potorous tridactylus	Long-nosed potoroo	v	v	This species inhabits coastal heath and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an important habitat feature, and may consist of grasstrees,	There are no records of the Long-nosed potoroo from within 10 km of the subject site from the NSW BioNet online database.	Unlikely

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence
Amphibians						
				sedges, ferns, or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.	No suitable habitat is available in the subject site.	
Pseudomys novaehollandiae	New Holland mouse		V	Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes.	There are no records of the New Holland mouse from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
Pteropus poliocephalus	Grey-headed flying-fox	V	V	This species occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths, and swamps as well as urban gardens and cultivated fruit crops. This species feeds on the nectar and pollen of native trees, in particular <i>Eucalyptus</i> , <i>Melaleuca</i> and <i>Banksia</i> , and fruits of rainforest trees and vines. It also feeds on commercial fruit crops and on introduced tree species in urban areas. The grey-headed flying-fox roosts in aggregations of various sizes on exposed branches. Roost sites are generally located within 20 km of a regular food source and are typically located near water, such as lakes, rivers, or the coast. Roost vegetation includes rainforest patches, stands of <i>Melaleuca</i> , mangroves and riparian vegetation, but colonies also use highly modified vegetation in urban and suburban areas. The species can maintain fidelity to roost sites for extended	There are 47 records of the Grey-headed flying-fox from within 10 km of the subject site from the NSW BioNet online database. Suitable forage habitat for this species is limited to a small number of scattered flowering or fruiting trees.	Possible

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence			
Amphibians									
				periods, although new sites have been colonized.					
Saccolaimus flaviventris	Yellow-bellied sheathtail bat	v		The Yellow-bellied sheathtail-bat roost singly or in groups of up to six, in tree hollows and buildings. Forages for insects over the forest canopy, but lower in more open country. Forages in most habitats across its wide range, with and without trees.	There are two (2) records of the Yellow- bellied sheathtail bat from within 10 km of the subject site from the NSW BioNet online database. This species may traverse the area while foraging over cleared areas.	Possible			
Syconycteris australis	Common Blossom-bat	v		Common blossom-bats often roost in littoral rainforest and feed on nectar and pollen from flowers in adjacent heathland and paperbark swamps. They have also been recorded in a range of other vegetation communities, such as subtropical rainforest, wet sclerophyll forest and other coastal forests.	There are two (2) records of the Common blossom-bat from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely			
Reptiles									
Coeranoscincus reticulatus	Three-toed snake-tooth skink	V	V	This species inhabits rainforest and occasionally moist eucalypt forest, on loamy or sandy soils. This species feeds on earthworms and beetle grubs and is found in leaf litter, often immediately adjacent to fallen tree trunks.	There are no records of the Three-toed snake-tooth skink from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely			
Delma torquata	Collared delma		V	Due to specific habitat requirements, this species distribution is highly fragmented and restricted to only a few locations. The	There are no records of the Collared delma from within 10 km of the subject site from the NSW BioNet online database.	Unlikely			

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence
Amphibians						
				Collared delma is known from the western suburbs of Brisbane, QLD and the following sites: Bunya Mountains, Blackdown Tableland National Park (NP), Bullyard Conservation Park, D'Aguilar Range NP, Expedition NP, Naumgna and Lockyer Forest Reserves, Western Creek near Millmerran and the Toowoomba Range. This species inhabits eucalypt dominated woodland and open forest where it is associated with suitable micro- habitats (exposed rocky outcrops). The ground cover is predominantly native grasses, such as kangaroo grass (<i>Themeda triandra</i>), barbed- wire grass (<i>Cymbopogon refractus</i>), wiregrass (<i>Aristida</i> sp.) and Lomandra (<i>Lomandra</i> sp.). The presence of rocks, logs, bark and other coarse woody debris, and leaf litter (typically 30-100 mm thick) appears to be an essential characteristic of the collared delma microhabitat, and these features are always present where the species occurs.	No suitable habitat is available in the subject site.	
Furina dunmalli	Dunmall's snake		V	Preferred habitat is Brigalow Forest and woodland with fallen timber and ground litter, growing on cracking clay soils and clay loam soils. Also occurs in eucalypt and Callitris woodland with fallen timber and ground litter.	There are no records of the Dunmall's snake from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat is available in the subject site.	Unlikely
* NSW Biodiversity Con	servation Act 2016 (E	SC Act)				

Scientific name	Common name	BC Act*	EPBC Act [#]	Habitat assessment ¹	Records and suitable habitat	Likelihood of occurrence		
Amphibians	Amphibians							
# Commonwealth Enviro	onment Protection a	nd Biod	iversity (Conservation Act 1999 (EPBC Act)				
CE - Critically Endanger	ed, E - Endangered,	V - Vulr	nerable,	M - Migratory (marine, terrestrial or listed)				
¹ Sources (including spe	cific literature refer	ences) f	rom:					
• DCCEEW (2023 Available at <u>h</u>) Species Profile and ttp://www.environn	I Threat	s Databa <mark>/.au/cgi</mark> -	se. Department of Climate Change, Energy, the E <u>bin/sprat/public/sprat.pl</u> .	Environment and Water (DCCEEW). Australian Go	vernment.		
• DES (2022). Sp	• DES (2022). Species Profile Search. Department of Environment and Science (DES), Queensland Government.							
DoPE (2023). 7 and Heritage (Threatened biodivers OEH), NSW Governm	<i>ity prof</i> ent.	ile searc	h. Office of Environment and Heritage, Departme	ent of Planning and Environment (DoPE), Office o	of Environment		

APPENDIX 3 - TESTS OF SIGNIFICANCE

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

Grey-headed flying fox (Pteropus poliocephalus)

Extent of the local population

This species has been recorded foraging near the subject site during previous field surveys. There are 41 records of the Grey-headed flying fox from within 10 km of the subject site from the NSW BioNet online database.

The local population of this species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area. This species is highly mobile and can travel up to 50 km from the camp to forage. The local population of this species is therefore likely to extend to areas well outside of the study area.

Stages of the life-cycle affected by the proposal

The OEH Threatened Species Unit discusses the following threats for the Grey-headed flying fox:

- Loss of roosting and foraging sites.
- Electrocution on powerlines, entanglement in netting and on barbed-wire.
- Heat stress.
- Conflict with humans.
- Incomplete knowledge of abundance and distribution across the species' range
- Illegal shooting

No roost sites were recorded on the subject site, and it is considered that breeding requirements will not be disturbed as part of the proposed modification and any subsequent development. It is therefore not considered likely to contribute significantly to the threats listed above or any aspect of the Grey-headed flying fox life-cycle.

Likelihood of local extinction

No roost site is present on the subject site. It is expected that use of the subject site by this species is restricted to occasional foraging and fly overs. The proposed modification and any subsequent development is unlikely to have any significant impacts on potential habitat that is otherwise abundant across the broader landscape, and therefore, is considered unlikely to result in the local extinction of this species. There is no evidence to suggest this species would not continue to occur from time-to-time across the subject site and in surrounding areas.

Koala (Phascolarctos cinereus)

Extent of the local population

There are 278 records of the Koala from within 10 km of the subject site from the NSW BioNet online database. The Atlas of Living Australia contains no records of koalas from within the subject site, and no evidence of koala habitat use has been recorded from the subject site or surrounding landscape during all prior and recent fauna surveys.

The local population of this species is therefore likely to comprise those individuals that potentially occur on the subject site, as well as any individuals occurring in adjoining areas (contiguous or otherwise).

Stages of the life-cycle affected by the proposal

The OEH Threatened Species Profile for the Koala identifies the following threats:

- loss, modification and fragmentation of habitat
- disease (chlamydia)
- vehicle strike
- intense prescribed burns or wildfires that scorch or burn the tree canopy
- predation by roaming or domestic dogs
- heat stress through drought and heatwaves
- human-induced climate change.

Although Koalas can, and will use almost any mature vegetation while traversing, the highest quality habitat for this species on the subject site is restricted to seven (7) scattered PKFTs.

In addition, the subject site is surrounded by non-preferred habitat (i.e. rainforest, camphor dominated forest, disturbed grasslands) and resident development. With this considered, use of the subject site is almost certainly restricted to individuals traversing the landscape and is not likely to constitute an important area for long-term Koala persistence across the broader landscape.

Given the proposed modification and any subsequent development will result in the loss of scattered trees that currently show no evidence of use, and the proposed land-use is for an over 50s lifestyle resort, it is not considered likely to contribute significantly to the threats listed above or any aspect of the Koala life-cycle.

Likelihood of local extinction

Based on the removal of a small number of individual trees that currently show no use by koalas, it is considered unlikely that the proposed modification and any subsequent development will disrupt the lifecycle of the local population of this species to the point that it is at risk of extinction. Conversely, there is no evidence to suggest this species would not continue to occur in adjacent areas.

Little lorikeet (Glossopsitta pusilla)

Extent of the local population

This species has not been recorded on the subject site during previous or recent targeted surveys. There are three (3) records of the Little lorikeet from within 10 km of the subject site from the NSW BioNet online database.

The local population of this species comprises those individuals that potentially occur on the subject site, as well as any individuals occurring in adjoining areas (contiguous or otherwise). This species is highly mobile, so the local population of this species is therefore likely to extend to areas well outside of the subject site.

Stages of the life-cycle affected by the proposal

The OEH Threatened Species Profile for the Little lorikeet identifies the following threats:

- Given that large old Eucalyptus trees on fertile soils produce more nectar, the
 extensive clearing of woodlands for agriculture has significantly decreased food for
 the lorikeet, thus reducing survival and reproduction. Small scale clearing, such as
 during roadworks and fence construction, continues to destroy habitat and it will
 be decades before revegetated areas supply adequate forage sites.
- The loss of old hollow bearing trees has reduced nest sites, and increased competition with other native and exotic species that need large hollows with small entrances to avoid predation. Felling of hollow trees for firewood collection or other human demands increases this competition.
- Competition with the introduced Honeybee for both nectar and hollows exacerbates these resource limitations.
- Infestation of habitat by invasive weeds.
- Inappropriate fire regimes.
- Aggressive exclusion from forest and woodland habitat by over abundant Noisy Miners.
- Climate change impacts including reduction in resources due to drought.
- Degradation of woodland habitat and vegetation structure due to overgrazing.
- Lack of knowledge within the community regarding the species and its habitat requirements.
- Historical and ongoing loss of woodlands and dry open sclerophyll forests, including mallee because of agriculture, mining, forestry and residential development.

Although considered much less likely, it cannot be conclusively ruled out that scattered trees 'may' provide limited forage resources on the subject site. The proposed modification and any subsequent development will therefore only result in the minor loss of suitable forage habitat for this species by way of scattered paddock trees.

Likelihood of local extinction

With the above considered, it is considered highly unlikely that the proposed modification and any subsequent development will disrupt the lifecycle of the local population of this species to the point that it is at risk of extinction.

Masked owl (Tyto novaehollandiae)

Extent of the local population

There are two (2) record of the Masked owl from within 10 km of the subject site from the NSW BioNet online database. The local population of this species comprises any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the subject site. This species is highly mobile, so the local population of this species is therefore likely to extend to areas well outside of the subject site.

Stages of the life-cycle affected by the proposal

The Masked owl Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides.

The OEH Threatened Species Profile for the Barking owl discusses the following threats:

- Clearing and degradation of habitat, mostly through cultivation, intense grazing and the establishment of exotic pastures.
- Inappropriate forest harvesting practices that remove old, hollow-bearing trees and change open forest structure to dense regrowth.
- Firewood harvesting resulting in the removal of fallen logs and felling of large dead trees.
- Too-frequent fire leading to degradation of understorey vegetation which provides shelter and foraging substrates for prey species.
- Destruction of hollow-bearing trees, which provide both nest sites for the owls and refuge sites for their prey
- Competition for prey by foxes
- Poor organisation and availability of species data
- Nestling predation by native species such as goannas and brush-tailed possums
- High use of rodenticide impacts on large forest owls through secondary poisoning.
- Disturbance of nesting and excessive disturbance of foraging by inappropriate use of call-playback surveys

It cannot be conclusively ruled out that this species forages throughout scattered mature trees across the subject site; however, suitable nest / roost habitat is limited-to-absent.

The proposed modification and any subsequent development is not considered likely to contribute significantly to the threats listed above or any aspect of the Masked owls life cycle. Conversely, given the availability of suitable habitat across the broader landscape, it can be confidentially concluded that the proposed modification and any subsequent

development would not significantly impact the overall value of habitat or impede continued presence of this species.

Likelihood of local extinction

Given the availability of suitable habitat across the broader landscape, it can be confidentially concluded that the potential loss of marginal forage habitat by way of scattered paddock trees would not impede the continued potential presence of this species. As such, the proposed modification and any subsequent development will not result in the local extinction of this species.

Squirrel glider (Petaurus norfolcensis)

Extent of the local population

There are 12 records of the Squirrel glider from within 10 km of the subject site from the NSW BioNet online database. The local population of this species comprises those individuals that potentially occur on the subject site, as well as any individuals occurring in adjoining areas (contiguous or otherwise).

Stages of the life-cycle affected by the proposal

The OEH Threatened Species Profile for the Squirrel glider identifies the following threats:

- Habitat loss and degradation.
- Fragmentation of habitat.
- Loss of hollow-bearing trees.
- Loss of understorey food resources.
- Inappropriate fire regimes.
- Reduction in food resources due to drought.
- Mortality due to entanglement on barbed wire.
- Occupation of hollows by exotic species.
- Mortality due to collision with vehicles.
- Predation by exotic predators.
- Changes in spatial and temporal distribution of habitat due to climate change

It cannot be conclusively ruled out that scattered trees in the far western extent of the subject site 'may' provide limited forage resources. Notwithstanding, this habitat is unlikely to be of any importance when compared to the surrounding landscape.

Given the proposed modification and any subsequent development will result in the loss of scattered trees, of which little to no suitable hollows are available, is not considered likely to contribute significantly to the threats listed above or any aspect of the Squirrel glider life-cycle.

Likelihood of local extinction

Based on a review of preferred habitat features of the Squirrel glider it is considered unlikely that the proposed modification and any subsequent development will disrupt the lifecycle of the local population of this species to the point that it is at risk of extinction.

Yellow-bellied sheathtail bat (Saccolaimus flaviventis)

Extent of the local population

There are two (2) records of the Yellow-bellied sheathtail bat from within 10 km of the subject site; however, this species has not been recorded on the subject site during past surveys or based on interrogation of historical records.

The local population of this species comprises those individuals that potentially occur on the subject site, as well as any individuals occurring in adjoining areas (contiguous or otherwise). This species is highly mobile, so the local population of this species is therefore likely to extend to areas well outside of the subject site.

Stages of the life-cycle affected by the proposal

The Yellow-bellied sheathtail-bat roost singly or in groups of up to six, in tree hollows and buildings. It forages in most habitats across its wide range, with and without trees.

The OEH Threatened Species Profile for the Yellow-bellied sheathtail-bat identifies the following threats:

- Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.
- When foraging for insects, flies high and fast over the forest canopy, but lower in more open country.
- Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.
- Breeding has been recorded from December to mid-March, when a single young is born.

In the context of the extent of suitable habitat across the broader landscape, it can be confidentially concluded that the proposed modification and any subsequent development would not impede the continued presence of this species and is therefore unlikely to contribute significantly to the threats listed above or any aspect of the Yellow-bellied sheathtail-bat life cycle.

Likelihood of local extinction

Based on a review of preferred habitat features of the Yellow-bellied sheathtail bat and the loss of cleared habitat that is otherwise abundant across the broader landscape, it is considered unlikely that the proposed modification and any subsequent development will disrupt the lifecycle of the local population of this species to the point that it is at risk of extinction. There is no evidence to suggest this species would not continue to occur from time-to-time across the subject site and in surrounding areas. (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

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

- (i) 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;
- (ii) 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 subject site does not contain any intact vegetation that could represent an endangered or critically endangered ecological community.

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

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

Impacts from the proposed modification and any subsequent development are limited to the loss of scattered native and exotic trees that are otherwise abundant across the broader landscape.

(ii) 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 loss of scattered trees will not fragment or isolate areas of habitat as a result of the proposed action.

(iii) 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.

When considered in the context of the vegetation available across the broader landscape, the native vegetation and associated habitat values to be removed are considered insignificant. All threatened species that are considered a possible occurrence would be expected to continue utilising habitat available in surrounding areas.

(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 Biodiversity Conservation Act (2016) from the action proposed.

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

It is noted that under the EP&A Act, it is the responsibility of the consent or determining authority to form a view as to whether a proposed modification and any subsequent development or activity is likely to significantly affect threatened species, communities, populations or their habitat. This is achieved by undertaking an Assessment of Significance under Section 5A of the EP&A Act. In this regard, an assessment of significance has been conducted for the proposed works which concludes that a Species Impact Statement (SIS) is not required. It is further concluded within this report that the proposed works is unlikely to have a significant impact on recorded or potentially occurring threatened species, communities and their associated habitat.

As such, it is considered that the proposed modification and any subsequent development is not in conflict with the objectives or actions of the listed recovery plans.

(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.

An assessment of the proposed modification and any subsequent development against the Key Threatening Processes (KTP) listed in Schedule 4 of the BC Act (2016) indicates that with the adoption of the recommended mitigation measures, the proposed modification and any subsequent development is unlikely to exacerbate these KTPs on top of what is already present.

Conclusion

Based upon the above assessments, it is considered that the proposed modification and any subsequent development is not likely to have a significant impact to EECs or threatened flora and fauna both locally and across the broader landscape. It is therefore concluded that a Species Impact Statement (SIS) is not required.