18 June 2021

PVD No.21 Pty Ltd c/-
Andrew Morelli
Craig & Rhodes Pty Ltd.
PO Box 3220,
Rhodes NSW 2138

Dear Andrew

Re: Flora and fauna assessment for 53a Warriewood Road, Warriewood NSW

Project no. 34851

Biosis Pty Ltd was commissioned by Craig and Rhodes Pty Ltd to complete a flora and fauna assessment to describe the ecological values and constraints associated with the proposed lot subdivision at 53a Warriewood Road (Lot 2, DP1115877), New South Wales (NSW) (Appendix 1, Figure 1).

Biosis understands that Craig and Rhodes Pty Ltd proposes to subdivide Lot 2, DP1115877 into 23 lots for residential development (the project). The proposed subdivision will require earthworks and vegetation removal across the study area. A flora and fauna assessment is therefore required to accompany the development application for the approval of works.

The objective of this flora and fauna assessment is to determine the presence of any threatened flora, fauna, populations or ecological communities (biota) within the study area and, where applicable, assess the impacts of the subdivision on any such species or their habitats, listed under the; *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), NSW *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act). This report also considers the State Environmental Planning Policy (SEPP) Coastal Management 2018 and the *Controlled activities on waterfront land - Guidelines for riparian corridors on waterfront land* (NSW Office of Water 2012).

Background

The study area is approximately 0.92 hectares and is defined as R3 – Medium Density Residential, with a 2nd order stream, Narrabeen Creek (Photo 1, Appendix 1), located just outside the western border of the study area. The study area is located within Northern Beaches Local Government Area (LGA). The minimum lot size is for the study area is 0.06 hectares, therefore the native vegetation clearing threshold under the BC Act is 0.25 hectares. The study area is not located within the Biodiversity Values Map (BV Map) (OEH 2019a). The Warriewood Wetlands is however located approximately 55 metres south east of the study area, with 0.5 hectares of the study area mapped as a Proximity area for Coastal Wetlands as defined by the Coastal Management SEPP 2018 (Appendix 1; Figure 1).

Method

Database and literature review

Prior to completing the field investigation, information provided by Craig and Rhodes Pty Ltd as well as other key information was reviewed, including:

- Commonwealth Department of Agriculture, Water and Environment (DAWE) Protected Matters Search Tool for matters protected by the EPBC Act.
- NSW Environment, Energy and Science (EES) BioNet Atlas of NSW Wildlife, for items listed under the BC Act.
- The NSW Department of Primary Industries (DPI) Spatial Data Portal for FM Act listed threatened species, populations and communities.
- NSW DPI *Biosecurity Act 2015* for Priority listed weeds for the Greater Sydney Local Land Services (LLS) area.
- EES Vegetation Information System (VIS) mapping, including:
  - Southeast NSW Native Vegetation and Mapping - SCIVI. VIS_ID 2230 (DPIE 2010).
  - The Native Vegetation of the Sydney Metropolitan Area - Version 3.1, VIS_ID 4489 (OEH 2016).

The implications for the project were assessed in relation to key biodiversity legislation and policy including:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- *Environmental Planning and Assessment Act 1979* (EP&A Act).
- *Biodiversity Conservation Act 2016* (BC Act).
- *Local Land Services Act 2013* (LLS Act).
- *National Parks and Wildlife Act 1974* (NPW Act).
- *Water Management Act 2000* (WM Act).
- *Biosecurity Act 2015.* (Biosecurity Act).
- State Environmental Planning Policy (SEPP) Coastal Management 2018.
- SEPP (Koala Habitat Protection) 2020.
- *Pittwater Local Environmental Plan 2014.*
- *Pittwater 21 Development Control Plan 2019.*

Field investigation

A field investigation of the study area was undertaken on 28 May 2021 by Jane Raithby-Veall (Principal Botanist). Vegetation within the study area was surveyed using the random meander technique (Cropper 1993) over two person hours.

General classification of native vegetation in NSW used in this report is based on the classification system in Keith (2004) which uses three groupings of vegetation: vegetation formation, vegetation class and vegetation type, with vegetation type the finest grouping. The grouping referred to in this report is Plant Community Type (PCT) as defined by the Biodiversity Assessment Method (BAM) (DPIE 2020), and has been the standard used across NSW since 2016.

The vegetation types, within the study area, were stratified into PCTs broadly based on previous vegetation mapping, and the vegetation boundaries marked with a hand-held GPS in the field. Appropriate PCTs were selected on the basis of species composition and structure, known geographical distribution, landscape position, underlying geology, soil type, and any other diagnostic features.

A habitat-based assessment was completed to determine the presence of suitable habitat for threatened species previously recorded (EES 2021) or predicted to occur (Commonwealth of Australia 2021) within 5 kilometres. This list was filtered according to species descriptions, life history, habitat preference and soil preference to determine those species most likely to be present within the study area.

Results

The study area is located approximately 23 kilometres north of Sydney, in an area mainly comprised of residential land use with Warriewood Beach 1.5 kilometres to the east and Ku-ring-gai Chase National Park, four kilometres to the west.

Regional soil landscape mapping indicates that the study area occurs on the Warriewood landscape (Chapman et al. 2009), with soils characteristically deep (>150 centimetres), well-sorted, sandy Humus Podzols and Siliceous Sands overlying buried Acid Peats. This soil landscape is subject to localised flooding, often with a high water table and highly permeable soil. A small part of the northern study area is located on the Erina landscape, characterised by undulating to rolling rises and low hills on the Terrigal Formation. Soils are moderately deep yellow Podzolic Soils on fine-grained bedrock and deep structured Loams and Yellow Earths along drainage lines. This soil landscape is subject to seasonal waterlogging of foot slopes and strongly acidic soils of low fertility.

Vegetation communities

Prior to the field investigation, Biosis confirmed that two native vegetation communities including one Threatened Ecological Community (TEC) have been mapped in the broader landscape (OEH, 2016, EES 2021), these include:

- *Swamp Sclerophyll Forest on Coastal Floodplains* (Endangered, BC Act).
- *Urban Native and Exotic.*

A key focus of the field investigation was to assess the vegetation of the study area against the final determinations for the above listed TEC to determine presence or absence.

The vegetation of the study area was found to comprise two communities, Urban Native/Exotic (0.05 hectares), and Exotic grasslands and weeds (0.84 hectares) throughout the remainder of the study area (Plate 1). A list of flora and fauna recorded within the study area as well as associated photos are provided in Appendix 2, Appendix 3 and Appendix 4.

Threatened species

Background searches identified 26 threatened flora species and 103 threatened fauna species recorded (EES 2021) or predicted to occur (Commonwealth of Australia 2021) within 5 kilometres of the study area. Those species considered most likely to have habitat within the study area based on the background research are as follows:

Flora

- Caley's Grevillea *Grevillea caleyi* (Critically Endangered, EPBC and BC Act).
- Angus's Onion Orchid *Microtis angusii* (Endangered, EPBC and BC Act).
- Scrub Turpentine *Rhodamnia rubescens* (Crittically Endangered, BC Act).

Fauna

- Eastern Coastal Free-tailed Bat *Micronomus norfolkensis* (Vulnerable, BC Act).

- Glossy Black-Cockatoo *Calyptorhynchus lathami* (Vulnerable, BC Act).
- Grey-headed Flying-fox *Pteropus poliocephalus* (Vulnerable, EPBC Act and BC Act).
- Koala *Phascolarctos cinereus* (Vulnerable EPBC Act and BC Act).
- Large Bent-winged Bat *Miniopterus orianae oceanensis* (Vulnerable, BC Act).
- Little Bent-winged Bat *Miniopterus australis* (Vulnerable, BC Act).
- Powerful Owl *Ninox strenua* (Vulnerable, BC Act).
- Red-crowned Toadlet *Pseudophryne australis* (Vulnerable, BC Act).
- Southern Myotis *Myotis macropus* (Vulnerable, BC Act).
- Squirrel Glider *Petaurus norfolcensis* (Vulnerable, BC Act).
- Swift Parrot *Lathamus discolor* (Critically Endangered, EPBC Act and Endangered, BC Act).
- White-bellied Sea-Eagle *Haliaeetus leucogaster* (Vulnerable, BC Act).

No threatened flora species were recorded within the study area during field investigations, and none are considered to occur. Based on the size of the study area and due the high amount disturbance, the survey effort is considered comprehensive to assess the presence of the flora species within the study area. Taking all of these factors into consideration, there is a low likelihood of occurrence of the above listed threatened flora.

No hollow-bearing trees were recorded within the study area. As such, hollow-dependent fauna species, including the Squirrel Glider, Glossy Black-Cockatoo, Powerful Owl and threatened microbat species, are unlikely to utilise the study area as anything more than marginal foraging habitat. Given this, the proposed works are unlikely to significantly impact any of the above threatened fauna species, and a NSW Test of Significance (ToS) is not required.

Foraging resources and roosting habitat was not evident in the study area for threatened birds. The degraded grassland vegetation is considered to be low quality foraging habitat compared to the vegetation upstream and in Ku-ring-gai Chase National park to the west that offer higher quality foraging habitat. The proposed works will not remove any significant foraging or roosting habitat for threatened birds and will not require further assessment.

Narrabeen Creek provides suitable habitat for a range of common frog species such as Common Eastern Froglet *Crinia signifera*, however due to the shady habitat and lack of pools or ponds and certain aquatic plants, the study area does not provide habitat for threatened frogs. The study area does not provide breeding habitat for the Red-crowned Toadlet and will not require a ToS.

No Grey-headed Flying-fox camps occur within the study area, with the nearest camp located 500 metres to the south (Commonwealth of Australia 2015). Although Grey-headed Flying-foxes may utilise the area on occasion for foraging (seasonal flowering gums, of which there are two up on Warriewood Road within the study area), the site is unlikely to provide more than marginal foraging habitat. Thus, a ToS is not required.

Therefore, none of the threatened species known or predicted to occur (apart from foraging) within the study area have been assessed as having more than a low likelihood of occurrence, on more than a temporary or transient basis. As such no further assessment of impacts to threatened species is required.

Priority weeds

Eight priority weeds for the Greater Sydney Local Land Services region, which includes the Northern Beaches Council LGA, that have been recorded in the study area are listed in Table 1, along with their associated Duty (where relevant to the project).

Table 1 Priority weeds in the study area

Scientific name	Common name	General biosecurity duty
Asparagus aethiopicus	Climbing Asparagus	**Regional Recommended Measure** *The plant should be eradicated from the land and the land kept free of the plant. Notify local control authority if found.*
Opuntia stricta	Common Pear	-
Senecio madagascariensis	Fireweed	-
Arundo donax	Giant reed	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should not be bought, sold, grown, carried or released into the environment.*
Cestrum parqui	Green cestrum	**Regional Recommended Measure** *Land managers should mitigate the risk of new weeds being introduced to their land. The plant should not be bought, sold, grown, carried or released into the environment.*
Lantana camara	Lantana	-
Ludwigia peruviana	Ludwigia	**Regional Recommended Measure** *Land managers mitigate the risk of the plant being introduced to their land. Land managers prevent spread from their land where feasible. Land managers reduce the impact on priority assets. The plant should not be bought, sold, grown, carried or released into the environment. Local Control Authority is notified if the plant is found on the land.*
Anredera cordifolia	Madeira vine	-

To prevent biosecurity impacts from occurring as a result of the presence of the above listed priority weeds within the study area, all practical steps should be taken to control and eradicated the weeds from the study area prior to or during vegetation removal.

Aquatic environments

Narrabeen Creek flows from north to south, to the west of the study area (Appendix 1; Figure 1) amongst a high volume of weeds and rubbish (Photo 1, Appendix 2), the creek is a second order stream, and was consistently flowing, ultimately into Narrabeen Lagoon just over 2 kilometres away. The proposed works are not planned to impact Narrabeen Creek.

The study area contains waterfront land as it includes the bed/bank of a waterway. A controlled activity approval must be obtained from the Office of water before commencing the proposed works, which will require the protection, restoration or rehabilitation of vegetated riparian corridors (Figure 1, Appendix 1). A Vegetation Management Plan (VMP) will therefore be required to gain controlled activity approval within the riparian corridor present in the study area.

Impact assessment

The proposed subdivision will involve the following impacts to biodiversity features:

- Removal of up to four Swamp Oaks, *Casuarina glauca* (Photo 2, Appendix 2).
- Removal of 0.84 ha of vegetation consistent with weeds and exotics (Photo 3, Appendix 2).
- Removal of 0.05 ha of low quality habitat for flora and fauna species.
- There will be minimal or no impacts to the nearby Narrabeen Creek, the Coastal Wetlands nor the downstream area of Narrabeen Lagoon.

The proposed works are not considered likely to result in a significant impact to threatened species and/or their habitats as listed under the EPBC Act or BC Act.

Works should proceed as planned (Appendix 1; Figure 1) whilst implementing the recommendations outlined below to minimise and mitigate any residual impact to biodiversity values.

State Environmental Planning Policy (Coastal Management) 2018

A portion of the study area is mapped as Proximity Area for Coastal Wetlands as defined by the SEPP Coastal Management 2018 (Appendix 1; Figure 1).

Part 2 Division 1 Clause 11 of SEPP Coastal Management provides controls regarding land in proximity to coastal wetlands mapping, highlighting the need to consider a potential significant impact on the biophysical, hydrological or ecological integrity of the adjacent Coastal Wetland or the quantity or quality of surface or groundwater flows to the adjacent Coastal Wetland. Based on the proximity of the wetland to downstream Narrabeen Lagoon and the small linear nature of works in a highly disturbed area, it is unlikely to significantly impact the biophysical, hydrological or ecological integrity of the Coastal Wetland.

Given the study area contains waterfront land (on Narrabeen Creek), a controlled activity approval must be obtained from the Office of Water before commencing the proposed works, which will require the rehabilitation of 0.07 hectares of the vegetated riparian zone (Figure 1, Appendix 1). A Vegetation Management Plan (VMP) will therefore need to be prepared.

State Environmental Planning Policy (Koala Habitat Protection) 2020

The study area is located within a Schedule 1 LGA (Northern Beaches Council) and does not contain any listed feed trees for Koalas under the SEPP. As no feed trees are proposed to be impacted, and the proposed works are to be assessed under Part 5 of the EP&A Act. Therefore, the SEPP does not apply and needs no further consideration.

Local Environmental Plan

The study area is not mapped as having biodiversity value on the Terrestrial Biodiversity mapping under the LEP.

Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Australian Government's key piece of environmental legislation. The EPBC Act applies to developments and associated activities that have the potential to significantly impact on Matters of National Environmental Significance (NES) protected under the Act. Under the EPBC Act, activities that have potential to result in significant impacts on Matters of NES must be referred to the Commonwealth Minister for the Environment and Energy for assessment.

No Threatened ecological communities or threatened species listed under the EPBC Act were recorded or assessed to have a medium or greater potential to occur within the study area. It is concluded that a

significant impact was not likely to result from the project due to the lack of suitable habitat and disturbed nature of the vegetation.

On the basis of criteria outlined in Commonwealth of Australia (2013) it is considered unlikely that a significant impact on a Matter of NES would result from the project. However, Craig and Rhodes Pty Ltd may choose to refer the proposed action to the Australian Government Minister for the Environment and Energy to determine whether the action requires approval under the EPBC Act.

Biodiversity Conservation Act 2016

No Threatened ecological communities or threatened species listed under the BC Act have a medium or greater likelihood of occurring within the study area. It is concluded that a significant impact was not likely to result from the project due to the lack of suitable habitat and disturbed nature of the vegetation.

Biodiversity Offsets Scheme

The proposed works does not trigger the Biodiversity Offset Scheme (BOS) under the BC Act as described in Table 2 below, and consideration of the BOS is not warranted, and a Biodiversity development Assessment report (BDAR) is not required.

Table 2 Biodiversity Offset Scheme assessment

BOS Trigger	Yes/No	Justification
Clearing threshold	No	The total clearing of vegetation (0.05 ha) does not exceed the minimum clearing threshold of 0.25 ha, based on a minimum lot size of 0.6 ha.
BV Map	No	The project will not impact on areas mapped within the BV Map.
Significant impact	No	The project is unlikely to result in a significant impact on threatened species, populations or communities listed under the BC Act.

Recommendations

As there is not likely to be a significant impact on threatened biota an Environmental Impact Statement (EIS) is not required.

As there are requirements for removal of up to 0.05 hectares of native vegetation (Urban Native/Exotic) for the project and the study area contains various biodiversity values, the focus of the recommendations is to minimise disturbance native vegetation and Narrabeen Creek. These recommendations include:

- A controlled activity approval must be obtained from the Office of Water before commencing the proposed works, which will require the rehabilitation of 0.07 ha of the vegetated riparian zone (Figure 1, Appendix 1). A VMP will therefore need to be prepared for this area.
- Appropriate erosion and sediment control measures should be installed to avoid sedimentation of Narrabeen Creek or other indirect impacts to surrounding biodiversity values.
- To the fullest extent practicable, minimise disturbance to any native vegetation surrounding the study area.
- Where possible, any trees to be retained should be protected in accordance with Australian Standard AS4970 – 2009 Protection of trees on development sites, during construction, operation and decommissioning of the site.

- In the unlikely event that unexpected threatened species are identified during the project, works should cease and an ecologist contacted.
- Maintain or rehabilitate a VRZ with fully structured native vegetation in accordance with the Guideline.
- Minimise disturbance and harm to the recommended VRZ.
- Locate services and infrastructure outside of the VRZ.
- Treat stormwater run-off before discharging into the VRZ.
- Ensure that all vehicle tyres, undercarriages and the soles of shoes are free of mud and soil before entering and exiting the study area if travelling from a site known to harbour chytrid fungus and/or soil borne pathogens in accordance with the *Hygiene Protocol for the Control of Disease in Frogs* (DECC 2008).
- Weeds and exotic vegetation that is removed as part of the project works to be taken to Kimbriki tip due to this vegetation including priority weeds; Common Pear, Climbing Asparagus, Green Cestrum, Fireweed, Giant Reed, Lantana, Ludwigia and Madeira Vine.
- Minimise soil transportation within, into or out of the study area to reduce the spread of weeds. Vehicles entering the site should be clean of soil and debris.

I trust that this advice is of assistance to you however please contact me if you would like to discuss any elements of this ecological advice further.

Yours sincerely

Jane Raithby-Veall

Associate Director

References

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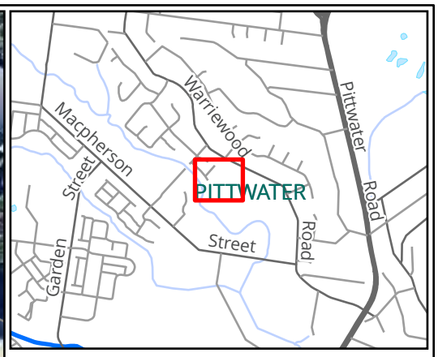
Appendices

Appendix 1 Figure 1



Legend

- Study area
- Vegetated Riparian Zone

Weed mapping - point

- Giant Reed
- Green Cestrum
- Lantana
- Ludwigia
- Common Pear
- Fireweed
- Madeira Vine
- Ground Asparagus

Weed mapping - patch

- Giant Reed
- Ludwigia

Vegetation communities

- Urban Native/Exotic
- Exotic grasslands and weeds

SEPP (Coastal Management) 2018

- Land Application Map

Coastal Wetlands

- Coastal Wetlands
- Proximity Area for Coastal Wetlands

Figure 1 Ecological features

0 6 12 18 24 30

Metres

Scale: 1:700 @ A3

Coordinate System: GDA 1994 MGA Zone 56

N

biosis

Matter: 34851,
Date: 11 June 2021 ,
Prepared for: JRV, Prepared by: LH, Last edited by: amackegard
Layout: 34851_F1_EcoFeatures
Project: P:\34800s\34851\Mapping\
34851_Figures.aprx

Appendix 2 Photos

Photo 1 **Rubbish and weeds in the Narrabeen Creek on the western section of the study area**

Photo 2 **Three of the four Swamp Oaks, *Casuarina glauca* in the study area as part of Urban Native/Exotic vegtation**

Photo 3 Exotic grassland and weeds that cover the majority of the study area

Appendix 3 Flora

Flora species recorded from the study area

Table A. 1 Flora species recorded by Biosis, 28/05/2021

Status	Scientific name	Common name
Native species		
	Angophora costata	Sydney Red Gum
	Eucalyptus saligna	Blue Gum
Naturalised in NSW	*Acacia saligna*	Golden wreath wattle
	Casuarina glauca	Swamp Oak
	Parsonsia straminea	Common Silkpod
	Entolasia marginata	Wiry Panic
	Commelina cyanea	Scurvy Weed
	Viola hederacea	Native Violet
	Hydrocotyle peduncularis	Pennywort
	Pteridium esculentum	Bracken
	Oplismenus aemulus	Basket Grass
	Centella asiatica	Asiatic Pennywort
	Persicaria hydropiper	Water Pepper
	Persicaria decipiens	Slender Knotweed
	Lomandra longifolia	Matt Rush
Exotic species		
PW	*Asparagus aethiopicus*	Climbing Asparagus
PW	*Opuntia stricta*	Common Pear
PW	*Senecio madagascariensis*	Fireweed
PW	*Arundo donax*	Giant reed
PW	*Cestrum parqui*	Green cestrum
PW	*Lantana camara*	Lantana
PW	*Ludwigia peruviana*	Ludwigia
PW	*Anredera cordifolia*	Madeira vine
	Erythrina crista-galli	Cockspur coral tree
	Morus nigra	Black Mulberry

	Ageratina adenophora	Crofton Weed
	Ligustrum sinense	Small-leaved Privet
	Bidens pilosa	Cobbler's Pegs
	Sonchus oleraceus	Common Sowthistle
	Ipomoea alba	Morning Glory
	Taraxacum officinale	Dandelion
	Tradescantia fluminensis	Wandering Jew
	Trifolium repens	White Clover
	Cinnamomum camphora	Camphor laurel
	Pennisetum clandestinum	Kikuyu
	Bouteloua dactyloides	Buffalo Grass
	Conzya bonariensis	Fleabane
	Anagallis arvensis	Scarlet Pimpernel
	Plantago minor	Plaintain
	Phytolacca octandra	Ink Weed
	Hydrocotyle bonariensis	Hydrocotyle
	Solanum mauritianum	Giant Tobacco
	Verbena bonariensis	Purple top
	Citrus sp.	Lemon Tree
	Ficus sp.	Fig tree
	Prunus sp.	Cherry Blossom
	Tradescantia fluminensis	Trad

A1.1 Threatened flora species and ecological communities

The following table includes a list of the threatened flora species and ecological communities that have potential to occur within the study area. The list of species is sourced from the NSW BioNet Wildlife Atlas and the Protected Matters Search Tool (DEE; accessed on 31/05/2021).

Examples of criteria for determining the likelihood of occurrence for threatened biota as a guide for writing the rationale for likelihood have been listed below.

Likelihood of occurrence	Potential criteria
High	• Species/ecological communities recorded in study area during current or previous assessment/s. • Aquatic species recorded from connected waterbodies in close proximity to the study area during current or previous assessment/s. • Sufficient good quality habitat is present in study area or in connected waterbodies in close proximity to the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within 5 km or from the relevant catchment/basin.
Medium	• Records of terrestrial biota within 5 km of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within 5 km of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitat present (low quality & extent). • Substantial loss of habitat since any previous record(s).
Negligible	• Habitat not present in study area • Habitat for aquatic species not present in connected waterbodies in close proximity to the study area. • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.

Table A.3 Threatened flora species recorded / predicted to occur within 5 kilometres of the study area

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Acacia bynoeana	Bynoe's Wattle	VU	EN	#		Low	High disturbance, habitat not suitable.	Semi prostrate shrub growing in central eastern NSW spanning from the Hunter District, west to the Blue Mountains and south to the Southern Highlands. Grows in a variety of communities including; Southern Tableland Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands and Sydney Coastal Heaths. Prefers open, slightly disturbed sites on sandy soils.
Asterolasia elegans		EN	EN	#		Low	High disturbance, habitat not suitable.	Tall, thin shrub found growing north of Sydney in the Baulkham Hills, Hawkesbury and Hornsby districts. Could also occur in the Goulburn area. Grows in wet sclerophyll forest on moist hillsides in Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests and North Coast Wet Sclerophyll Forests. Grows on Hawkesbury sandstone.
Caladenia tessellata	Thick Lip Spider Orchid	VU	EN	#		Low	High disturbance, habitat not suitable.	Small orchid recorded from the Wyong, Ulladulla and Braidwood regions with the Kiama and Queanbeyan populations believed to be extinct. Found in a wide variety of communities including Central Gorge Dry Sclerophyll Forests, Cumberland Dry Sclerophyll Forests, Coastal Floodplain Woodlands and Subalpine Woodlands. Grows on clay loam or sandy soils.
Callistemon linearifolius	Netted Bottle Brush		VU	2014		Low	High disturbance,	Shrub recorded from the Georges River to the Hawkesbury River, north of the Nelson Bay area and south at Coalcliff in the Illawarra region. Grows on the coast and adjacent

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
							habitat not suitable.	ranges in a variety of communities including Cumberland Dry Sclerophyll Forests, Coastal Floodplain Wetlands, Sydney Coastal Heaths and North Coast Wet Sclerophyll Forests.
Chamaesyce psammogeton	Sand Spurge		EN	2019		Low	High disturbance, habitat not suitable.	Mat forming herb with a sparse distribution along the coast spanning from the south of Jervis Bay to Queensland. Grows on exposed headlands, fore dunes or pebbly strand-lines near the sea in a variety of communities including South Coast Sands Dry Sclerophyll Forests, Sydney Coastal Heaths, and Maritime Grasslands. Grows in sand soils.
Cryptostylis hunteriana	Leafless Tongue Orchid	VU	VU	#		Low	High disturbance, habitat not suitable.	Orchid with a distribution spanning from Gibraltar Range National Park southwards to the coastal area near Orbost in Victoria. Grows in a variety of communities including Sydney Coastal Dry Sclerophyll Forests, Coastal Heath Swamps, New England Dry Sclerophyll Forests and Sydney Coastal Heaths. Grows in sandy soils.
Epacris purpurascens var. *purpurascens*			VU	2019		Low	High disturbance, habitat not suitable.	Erect shrub distributed from Gosford in the north, Silverdale to the west, Narrabeen in the east and Avon Dam in the south. Grows in scrubs and swamps in a variety of communities including Cumberland Dry, Sydney Hinterland Dry, Northern Hinterland Wet, and Southern Tableland Wet Sclerophyll Forests, Eastern Riverine Forests, and Coastal Valley Grassy Woodlands. Grows in soils with a strong shale influence on sandstone substrates.
Eucalyptus camfieldii	Camfield's Stringybark	VU	VU	1997		Low	High disturbance,	Mallee tree restricted to a narrow band stretching from Raymond Terrace to the north and Waterfall in the south. Grows in scattered, localised distributions including sites at

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
							habitat not suitable.	Norah Head, Terrey Hills, North Head, Menai, Mt Colah, Peats Ridge and Elvina Bay Trail. Grows in scattered stands near the boundaries of tall coastal heath and low open woodland in a variety of communities including Sydney Coastal Dry Sclerophyll Forests, Eastern Riverine Forests, Sydney Coastal Heaths and Wallum Sand Heaths. Grows in sandy soils on Hawkesbury sandstone.
Genoplesium baueri	Bauer's Midge Orchid	EN	EN	2014#		Low	High disturbance, habitat not suitable.	Terrestrial orchid with 13 populations totalling 200 plants distributed between Ulladulla and Port Stephens. Grows on moss gardens in a variety of communities including Sydney Coastal Dry sclerophyll Forests, Sydney Coastal Heaths, Sydney Montane Heaths, Southern Lowland Wet Sclerophyll Forests and Sydney Hinterland Dry Sclerophyll Forests. Grows on sandstone substrates
Grammitis stenophylla	Narrow-leaf Finger Fern		EN	2019		Low	High disturbance, habitat not suitable.	Small fern growing on the south, central and north coasts of NSW with records from Mount Kaputar National Park at Narrabri forming its western limit. Grows near streams in moist places on rocks or in trees in a variety of communities including Sydney Montane Dry Sclerophyll Forest, Dry Rainforest, Littoral Rainforest, Northern Warm Temperate Forests and North Coast Wet Sclerophyll Forests.
Grevillea caleyi	Caley's Grevillea	CR	CR	2019		Low	High disturbance, habitat not suitable.	Medium to tall shrub restricted to an 8 km square area around Terrey Hills. Grows on ridgetops at elevations between 170m to 240m in association with Silver top Ash *Eucalyptus sieberi* and Red Bloodwood *Corymbia gummifera* in Duffys Forest in the Sydney Basin Bioregion, Sydney

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
								Coastal Dry Sclerophyll Forest. Grows on sandstone substrates in laterised soils.
Isotoma fluviatilis subsp. *fluviatilis*		EX		1963		Low	High disturbance, habitat not suitable.	Known to grow in damp places, on the Cumberland Plain, including freshwater wetland, grassland/alluvial woodland and an alluvial woodland/shale plains woodland (Cumberland Plain Woodland) ecotone. May be an early successional species that benefits from some disturbance. Possibly out competed when overgrown by some species such as Cyndon dactylon.
Kunzea rupestris		VU	VU	2007		Low	High disturbance, habitat not suitable.	Clonal shrub restricted to 20 populations growing throughout the Maroota - Sackville - Glenorie area with one outlier at Ku-ring-gai Chase National Park. Grows in shallow depressions on rock platforms and outcrops in Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests and Sydney Coastal Heaths. Grows on sandstone substrates.
Lasiopetalum joyceae		VU	VU	2013		Low	High disturbance, habitat not suitable.	Erect, medium sized shrub restricted to 34 sites within the Hornsby Plateau from Berrilee to Duffys Forest. Grows on lateritic or shale influenced ridgetops in Sydney Coastal Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests and Sydney Coastal Heaths. Grows on sandstone substrates.
Macadamia integrifolia	Macadamia Nut	VU		2018		Low	High disturbance, habitat not suitable.	Medium sized tree found growing from Mount Bauple, near Gympie to Currumbin Valley in the Gold Coast hinterland in south-east Queensland. Occurs in the

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
								Northern Rivers region of NSW in remnant rainforest, mixed notophyll forest forest and rainforest margins.
Melaleuca biconvexa	Biconvex Paperbark	VU	VU	#		Low	High disturbance, habitat not suitable.	Large shrub or small tree confined to NSW with scattered, widely dispersed populations around the Jervis Bay area in the south and the Gosford-Wyong area to the north. Grows in damp places, often near streams or low lying areas on low slopes or sheltered aspects in a variety of communities including Hunter-Macleay Dry Sclerophyll Forests, Coastal Swamp Forests, Coastal Floodplain Wetlands, Coastal Freshwater Lagoon and North Coast Wet Sclerophyll Forests. Grows in alluvial soils.
Microtis angusii	Angus's Onion Orchid	EN	EN	2015		Low	High disturbance, habitat not suitable.	Terrestrial orchid restricted to one site at Ingleside, north of Sydney. Grows in Sydney Coastal Heaths including Duffy's Forest. Originally growing on ridgetop lateritic soils in the Duffys Forest - Terrey Hills - Ingleside and Belrose areas but now growing on highly modified soils.
Persicaria elatior	Tall Knotweed	VU	VU	#		Low	High disturbance, habitat not suitable.	Erect herb found growing in south-eastern NSW at Moutn Dromedary, Moruya State Forest near Turlinjah, Upper Avon River catchment north of Robertson, Bermagui and Picton Lakes. Also grows in northern NSW around Raymond Terrace near Newcastle and Cherry Tree and Gibberagee State Forests in the Grafton area. Grows in damp places usually on the margins of waterbodies and in swamp forests in a variety of communities including Coastal Floodplain Wetlands, Coastal Swamp Forests, Eastern Riverine Forests, Coastal Freshwater Lagoons and Coastal Heath Swamps.

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
Persoonia hirsuta	Hairy Geebung	EN	EN	#		Low	High disturbance, habitat not suitable.	Spreading, hairy shrub with a scattered distribution throughout Sydney from Singleton to the north, the east coast of Bargo to the south and the Blue Mountains to the west. Grows at elevations between 350 - 600 metres in a variety of communities including Southern Tableland Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Western Slopes Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands, Sydney Coastal Heaths and Southern Escarpment Wet Sclerophyll Forests. Grows in sandy soils on sandstone substrates.
Pimelea curviflora var. *curviflora*		VU	VU	2007#		Low	High disturbance, habitat not suitable.	Small to medium sized shrub restricted to coastal areas of Sydney. Grows on ridgetops and upper slopes amongst grasses and sedges in a variety of communities including Cumberland Dry Sclerophyll Forests, Sydney Hinterland Dry Sclerophyll Forests, Coastal Valley Grassy Woodlands, Sydney Coastal Heaths and Northern Hinterland Wet Sclerophyll Forests. Can be inconspicuous amongst grasses and sedges although easier to find in October to May when flowering. Grows on sandstone substrates in shale/lateritic soils and shale/sandstone transition soils.
Prostanthera densa	Villous Mint-bush	VU	VU	2012		Low	High disturbance, habitat not suitable.	Medium sized erect shrub recorded from the Currarong area in Jervis Bay, Royal National Park, Cronulla, Garie Beach and Port Stephens. Found growing in sclerophyll forest and shrubland on rocky slopes near coastal headlands and near-coastal ranges in South Coast Sands Dry Sclerophyll Forests, Sydney Coastal Dry Sclerophyll Forests, Maritime Grasslands, Sydney Coastal Heaths,

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
								Wallum Sand Heaths and Southern Lowland Wet Sclerophyll Forests. Grows on Sandstone substrates.
Prostanthera junonis	Somersby Mintbush	EN	EN	#		Low	High disturbance, habitat not suitable.	Small spreading shrub restricted to a north-south distribution on the Somersby Plateau in the Gosford and Wyong Local Government Areas. Found growing on disturbed and undisturbed sites near the coast on gently undulating landscapes in Sydney Coastal Dry Sclerophyll Forests, Sydney Coastal Heaths, Coastal Heath Swamps, Southern Lowland Wet Sclerophyll Forests. Grows in sandy soils over Hawkesbury Sandstone on both the Somersby and Sydney Town soil landscapes.
Rhodamnia rubescens	Scrub Turpentine		CR	2019		Low	High disturbance, habitat not suitable.	Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.
Syzygium paniculatum	Magenta Lilly Pilly	VU	EN	2018#		Low	High disturbance, habitat not suitable.	Small to medium sized rainforest tree restricted to a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. Found growing on stabilized dunes near the sea in South Coast Sands Dry Sclerophyll Forests, Coastal Swamp Forests, Coastal Headland Heaths, Littoral Rainforests, Northern Hinterland Wet Sclerophyll Forests and Southern Lowland Wet Sclerophyll Forests. Grows on grey sandy, gravelly, silty or clay soils over sandstone substrates.
Tetratheca glandulosa			VU	2017		Low	High disturbance,	Small, spreading shrub with 150 populations confined to the Baulkham Hills, Gosford, Hawkesbury, Ku-ring-gai, Pittwater, Ryde and Wyong Local Government Areas.

Scientific name	Common name	Conservation status		Most recent record	Other sources	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC					
							habitat not suitable.	Found growing in a variety of communities including Sydney Sandstone Ridgetop Woodland, Sydney Coastal Dry Sclerophyll Forests, Eastern Riverine Forests, Coastal Valley Grassy Woodlands, Sydney Montane Heaths and North Coast Wet Sclerophyll Forests. Grows in the shallow, yellow clay/sandy loams that are typical of shale/sandstone transition soils where shale caps occur over sandstone substrates such as the Lucas Heights, Gymea, Lambert and Faulconbridge soil landscapes.
Thesium australe	Austral Toadflax	VU	VU	#		Low	High disturbance, habitat not suitable.	Small, straggling herb with a distribution comprising of small populations scattered along the coast of eastern NSW including the Northern and Southern Tablelands, Tasmania, Queensland and eastern Asia. A root parasite found growing on damp sites in grassland, grassy woodlands and coastal headlands often in association with Kangaroo Grass Themeda triandra in a variety of communities including New England Dry Sclerophyll Forests, Western Slopes Grasslands, Northern Tableland Wet Sclerophyll Forests, Brigalow Clay Plain Woodlands, Subalpine Woodlands and Maritime Grasslands.

* - habitat descriptions have been adapted by qualified ecologists from the DEE Species Profile and Threats (SPRAT) Database, OEH Threatened Species online profiles and the NSW Scientific Committee final determinations for listed species, references within the above table are provided within the report reference list.

Table A.4 Threatened ecological communities recorded / predicted to occur within 5 kilometres of the study area

Scientific name	Conservation status		Likely occurrence in study area	Rationale for likelihood ranking
	EPBC	BC		
Blue Gum High Forest in the Sydney Basin Bioregion	CR	CR	Low	High disturbance, negligible native vegetation present.
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	VU	EN	Low	High disturbance, negligible native vegetation present.
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	EN		Low	High disturbance, negligible native vegetation present.
Coastal Upland Swamp in the Sydney Basin Bioregion	EN	EN	Low	High disturbance, negligible native vegetation present.
Coastal Upland Swamps in the Sydney Basin Bioregion	EN		Low	High disturbance, negligible native vegetation present.
Duffys Forest Ecological Community in the Sydney Basin Bioregion		EN	Low	High disturbance, negligible native vegetation present.
Eastern Suburbs Banksia Scrub in the Sydney Basin Bioregion	EN	CR	Low	High disturbance, negligible native vegetation present.
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		EN	Low	High disturbance, negligible native vegetation present.
Hygrocybeae Community of Lane Cove Bushland Park in the Sydney Basin Bioregion		CR	Low	High disturbance, negligible native vegetation present.

Scientific name	Conservation status		Likely occurrence in study area	Rationale for likelihood ranking
	EPBC	BC		
Kurnell Dune Forest in the Sutherland Shire and City of Rockdale		EN	Low	High disturbance, negligible native vegetation present.
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	CR	EN	Low	High disturbance, negligible native vegetation present.
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	CR	EN	Low	High disturbance, negligible native vegetation present.
Pittwater and Wagstaffe Spotted Gum Forest in the Sydney Basin Bioregion		EN	Low	High disturbance, negligible native vegetation present.
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		EN	Low	High disturbance, negligible native vegetation present.
Shale Sandstone Transition Forest in the Sydney Basin Bioregion	CR	CR	Low	High disturbance, negligible native vegetation present.
Southern Sydney sheltered forest on transitional sandstone soils in the Sydney Basin Bioregion		EN	Low	High disturbance, negligible native vegetation present.
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	EN	EN	Low	High disturbance, negligible native vegetation present.
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		EN	Low	High disturbance, negligible native vegetation present. Present along Narrabeen Creek further north and south of study area, none present on the study area

Scientific name	Conservation status		Likely occurrence in study area	Rationale for likelihood ranking
	EPBC	BC		
Sydney Freshwater Wetlands in the Sydney Basin Bioregion		EN	Low	High disturbance, negligible native vegetation present.
Sydney Turpentine-Ironbark Forest	CR	CR	Low	High disturbance, negligible native vegetation present.
The Shorebird Community occurring on the relict tidal delta sands at Taren Point		EN	Low	High disturbance, negligible native vegetation present.
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions		EN	Low	High disturbance, negligible native vegetation present.
Western Sydney Dry Rainforest in the Sydney Basin Bioregion	CR	EN	Low	High disturbance, negligible native vegetation present.

Appendix 4 Fauna

Fauna species recorded from the study area

Table A.4 Fauna species recorded by Biosis, 25/05/2021

Status	Scientific name	Common name
Birds		
O	*Trichoglossus moluccanus*	Rainbow Lorikeet
O	*Rhipidura leucophrys*	Willie Wagtail
O	*Malurus cyaneus*	Superb Fairy Wren
O	*Neochmia temporalis*	Red Browed Finch
O	*Caligavis chrysops*	Yellow-faced Honeyeater
O	*Phylidonyris niger*	White-cheeked Honeyeater
O	*Hirundo neoxena*	Welcome Swallow
O	*Manorina melanocephala*	Noisy Miner
O	*Passer domesticus*	House Sparrow
O	*Sericornis frontalis*	White-browed Scrubwren

O = observed, W = heard call, F = scratchings

A2.1 Threatened fauna species

The following table includes a list of the significant fauna species that have potential to occur within the study area. The list of species is sourced from the NSW BioNet Wildlife Atlas, BirdLife Australia data search and the Protected Matters Search Tool (DEE; accessed on 18/06/2021).

Notes to table:

- # species predicted to occur by the DEE database (not recorded on other databases)
- ## species predicted to occur based on natural distributional range and suitable habitat despite lack of records in the databases searched
- Year recorded on databases listed above
- 2018 recorded during current survey

Likelihood of occurrence	Potential criteria
High	• Species recorded in study area during current or previous assessment/s. • Aquatic species recorded from connected waterbodies in close proximity to the study area during current or previous assessment/s. • Sufficient good quality habitat is present in study area or in connected waterbodies in close proximity to the study area (aquatic species). • Study area is within species natural distributional range (if known). • Species has been recorded within 5 km or from the relevant catchment/basin.
Medium	• Records of terrestrial species within 5 km of the study area or of aquatic species in the relevant basin/neighbouring basin. • Habitat limited in its capacity to support the species due to extent, quality, or isolation.
Low	• No records within 5 km of the study area or for aquatic species, the relevant basin/neighbouring basin. • Marginal habitat present (low quality & extent). • Substantial loss of habitat since any previous record(s).
Negligible	• Habitat not present in study area • Habitat for aquatic species not present in connected waterbodies in close proximity to the study area. • Habitat present but sufficient targeted survey has been conducted at an optimal time of year and species wasn't recorded.

Table A.5 Threatened fauna species recorded, or predicted to occur, within 5 km of the study area

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
Mammals								
Balaenoptera musculus	Blue Whale	EN	EN		#	Negligible	Habitat not present	An oceanic species, which can be recorded in Australian waters.
Cercartetus nanus	Eastern Pygmy-possum		VU		2019	Low	Suitable habitat not present	Inhabits rainforest through to sclerophyll forest and tree heath. Banksias and myrtaceous shrubs and trees are a favoured food source, it also feeds on insects. Will often nest in tree hollows, but can also construct its own nest. Because of its small size it is able to utilise a range of hollow sizes including very small hollows. Individuals will use a number of different hollows and an individual has been recorded using up to 9 nest sites within a 0.5 ha area over a 5 month period.
Chalinolobus dwyeri	Large-eared Pied Bat	VU	VU		2018#	Low	Suitable habitat not present	Largest numbers from the sandstone escarpment country in the Sydney Basin and Hunter Valley. Primarily found in dry sclerophyll forests and woodlands, but also found in rainforest fringes and subalpine woodlands. Forages on small, flying insects below the forest canopy. Roosts in colonies of between three and 80 in caves, The only known existing maternity roost is in a sandstone cave near Coonabarabran.
Dasyurus maculatus	Spotted-tailed Quoll	EN	VU		2014#	Low	Suitable habitat not present	Uses a range of habitats including sclerophyll forests and woodlands, coastal heathlands and rainforests. Occasional sightings have been made in open country, grazing lands, rocky outcrops and other treeless areas. Habitat requirements include suitable den sites, including hollow logs, rock crevices and caves, an abundance of food and an area of intact vegetation in which to forage. Seventy per cent of the diet is medium-sized mammals, and also feeds on

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								invertebrates, reptiles and birds. Individuals require large areas of relatively intact vegetation through which to forage. The home range of a female is between 180 and 1000 ha, while males have larger home ranges of between 2000 and 5000 ha. Breeding occurs from May to August.
Dugong dugon	Dugong		EN		1992#	Negligible	Habitat not present	Dugongs are considered occasional visitors to NSW coastal and estuarine waters.
Eubalaena australis	Southern Right Whale	EN	EN		1993#	Negligible	Habitat not present	A marine species with a circumpolar distribution in the southern hemisphere.
Falsistrellus tasmaniensis	Eastern False Pipistrelle		VU		2018	Low	Suitable habitat not present	Distribution throughout the coastal regions of NSW. Prefers wet high-altitude sclerophyll and coastal mallee habitat, wet forests with a dense understorey but being found in open forests at lower altitudes. Roosts in tree hollows and sometimes in buildings in colonies of between 3 and 80 individuals. Forages for beetles, bugs and moths below or near the canopy in forests with an open structure, or along trails. Has a large foraging range, up to 136 ha. Records show movements of up to 12 km between roosting and foraging sites.
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	EN	EN		2019#	Low	Suitable habitat not present	This species prefers sandy soils with scrubby vegetation and/or areas with low ground cover that are burn from time to time. A mosaic of post fire vegetation is important for this species.
Megaptera novaeangliae	Humpback Whale	VU	VU		2011#	Negligible	Habitat not present	A marine species that has a worldwide distribution. It has a circumpolar distribution in the Southern Hemisphere.

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat		VU		2019	Low	Suitable habitat not present	Most records are from dry eucalypt forests and woodland. Individuals tend to forage in natural and artificial openings in forests, although it has also been caught foraging low over a rocky river within rainforest and wet sclerophyll forest habitats. The species generally roosts in hollow spouts of large mature eucalypts (including paddock trees), although individuals have been recorded roosting in the roof of a hut, in wall cavities, and under metal caps of telegraph poles. Foraging generally occurs within a few kilometres of roosting sites.
Miniopterus australis	Little Bent-winged Bat		VU		2019	Low	Suitable habitat not present	Occurs from Northern Queensland to the Hawkesbury River near Sydney. Roost sites encompass a range of structures including caves, tunnels and stormwater drains. Young are raised by the females in large maternity colonies in caves in summer. Shows a preference for well-timbered areas including rainforest, wet and dry sclerophyll forests, Melaleuca swamps and coastal forests. The Little Bentwing bat forages for small insects (such as moths, wasps and ants) beneath the canopy of densely vegetated habitats.
Miniopterus orianae oceanensis	Large Bent-winged Bat		VU		2019	Low	Suitable habitat not present	Forms large maternity roosts (up to 100,000 individuals) in caves and mines in spring and summer. Individuals may fly several hundred kilometres to their wintering sites, where they roost in caves, culverts, buildings, and bridges. They occur in a broad range of habitats including rainforest, wet and dry sclerophyll forest, paperbark forest and open grasslands. Has a fast, direct flight and forages for flying insects (particularly moths) above the tree canopy and along waterways.
Myotis macropus	Southern Myotis		VU		2019	Low	Suitable habitat not present	Roosts in caves, mines or tunnels, under bridges, in buildings, tree hollows, and even in dense foliage. Colonies occur close to water bodies, ranging from rainforest streams to large lakes and reservoirs.

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								They catch aquatic insects and small fish with their large hind claws, and also catch flying insects.
Petaurus norfolcensis	Squirrel Glider		VU		2018	Low	Suitable habitat not present	Generally occurs in dry sclerophyll forests and woodlands but is absent from dense coastal ranges in the southern part of its range. Requires abundant hollow-bearing trees and a mix of eucalypts, banksias and acacias. Within a suitable vegetation community at least one species should flower heavily in winter and one species of eucalypt should be smooth barked.
Petrogale penicillata	Brush-tailed Rock-wallaby	VU	EN		#	Low	Suitable habitat not present	Occurs along the Great Dividing Range south to the Shoalhaven, and also occurs in the Warrumbungles and Mt Kaputar. Habitats range from rainforest to open woodland. It is found in areas with numerous ledges, caves and crevices particularly with northern aspects. The species forages on grasses and forbs.
Phascolarctos cinereus	Koala	VU	VU		2020#	Low	Suitable habitat not present	In NSW the Koala mainly occurs on the central and north coasts with some populations in the western region. Koalas feed almost exclusively on eucalypt foliage, and their preferences vary regionally. Primary feed trees include *Eucalyptus robusta, E. tereticornis, E. punctata, E. haemostoma* and *E. signata.* They are solitary with varying home ranges.
Pseudomys novaehollandiae	New Holland Mouse	VU			#	Low	Suitable habitat not present	The New Holland Mouse currently has a disjunct, fragmented distribution. The New Holland Mouse is known to inhabit open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes. The home range of the New Holland Mouse can range from 0.44 ha to 1.4 ha. The New Holland Mouse is a social animal, living predominantly in burrows shared with other individuals. The species is nocturnal and omnivorous, feeding on seeds, insects, leaves, flowers and fungi, and is therefore likely to play an important

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								role in seed dispersal and fungal spore dispersal. It is likely that the species spends considerable time foraging above-ground for food, predisposing it to predation by native predators and introduced species. Breeding typically occurs between August and January, but can extend into autumn.
Pteropus poliocephalus	Grey-headed Flying-fox	VU	VU		2019#	Low	Suitable habitat not present	Occurs along the NSW coast, extending further inland in the north. This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Roosts in large colonies, commonly in dense riparian vegetation.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat		VU		1997	Low	Suitable habitat not present	Found throughout NSW in habitats including wet and dry sclerophyll forest, open woodland, acacia shrubland, mallee, grasslands and desert. They roost in tree hollows in colonies and have also been observed roosting in animal burrows, abandoned Sugar Glider nests, cracks in dry clay, hanging from buildings and under slabs of rock. Forages for insects above the canopy in forests.
Scoteanax rueppellii	Greater Broad-nosed Bat		VU		2018	Low	Suitable habitat not present	Occurs along the Great Dividing Range and in coastal areas. Occurs in woodland and rainforest, preferring open habitats or openings in wetter forests. Often hunts along creeks or river corridors. Preys upon beetles and other large, flying insects, other bats and spiders. Roosts in hollow tree trunks and branches.
Vespadelus troughtoni	Eastern Cave Bat		VU		2018	Low	Suitable habitat not present	Found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. It roosts in small groups, often in well-lit overhangs and caves, mine tunnels, road culverts, and occasionally in buildings.

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
Birds								
Anthochaera phrygia	Regent Honeyeater	CR	CR		2017#	Low	Suitable habitat not present	Regent Honeyeaters are semi-nomadic, occurring in temperate eucalypt woodlands and open forests. Most records are from box-ironbark eucalypt forest associations and wet lowland coastal forests. Nectar and fruit from mistletoes are also eaten. This species usually nest in tall mature eucalypts and sheoaks.
Ardenna carneipes	Flesh-footed Shearwater		VU		1966#	Low	Suitable habitat not present	The Flesh-footed Shearwater is an oceanic species usually found beyond the edge of the continental shelf.
Artamus cyanopterus cyanopterus	Dusky Woodswallow		VU		1995	Low	Suitable habitat not present	Primarily inhabits dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.
Botaurus poiciloptilus	Australasian Bittern	EN	EN		2012#	Low	Suitable habitat not present	The Australasian Bittern is distributed across south-eastern Australia. Often found in terrestrial and estuarine wetlands, generally where there is permanent water with tall, dense vegetation including *Typha* spp. and *Eleocharis* spp.. Typically this bird forages at night on frogs, fish and invertebrates, and remains inconspicuous during the day. The breeding season extends from October to January with nests being built amongst dense vegetation on a flattened platform of reeds.

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
Burhinus grallarius	Bush Stone-curlew		EN		2010	Low	Suitable habitat not present	The Bush Stone-curlew is found throughout Australia. Occurs in lightly timbered open forest and woodland, or partly cleared farmland with remnants of woodland, with a ground cover of short sparse grass and few or no shrubs where fallen branches and leaf litter are present.
Calidris canutus	Red Knot	EN			#	Low	Suitable habitat not present	Typically located within intertidal mudflats, sandflats and sandy beaches of sheltered coasts. Occasionally found on sandy open beaches or shallow pools, or in saline wetlands close to the coast.
Calidris ferruginea	Curlew Sandpiper	CR	EN		#	Low	Suitable habitat not present	Inhabits sheltered intertidal mudflats. Also non-tidal swamps, lagoons and lakes near the coast. Infrequently recorded inland.
Callocephalon fimbriatum	Gang-gang Cockatoo		VU		2016	Low	Suitable habitat not present	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine Snow Gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box-ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed.
Calyptorhynchus lathami	Glossy Black-Cockatoo		VU		2019	Low	Suitable habitat not present	Inhabits forest with low nutrients, characteristically with key Allocasuarina species. Tends to prefer drier forest types. Often confined to remnant patches in hills and gullies. Breed in hollows stumps or limbs, either living or dead.
Circus assimilis	Spotted Harrier		VU		2006	Low	Suitable habitat not present	The Spotted Harrier is found throughout Australia but rarely in densely forested and wooded habitat of the escarpment and coast. Preferred habitat consists of open and wooded country with grassland nearby for hunting. Habitat types include open grasslands,

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								acacia and mallee remnants, spinifex, open shrublands, saltbush, very open woodlands, crops and similar low vegetation. Nesting occurs in open or remnant woodland and unlike other harriers, the Spotted Harrier nests in trees.
Daphoenositta chrysoptera	Varied Sittella		VU		2014	Low	Suitable habitat not present	The Varied Sittella is a sedentary species which inhabits a wide variety of dry eucalypt forests and woodlands, usually with either shrubby understorey or grassy ground cover or both. Usually inhabit areas with rough-barked trees, such as stringybarks or ironbarks, but also in mallee and acacia woodlands, paperbarks or mature Eucalypts. The Varied Sittella feeds on arthropods gleaned from bark, small branches and twigs. It builds a cup-shaped nest of plant fibres and cobweb in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years.
Dasyornis brachypterus	Eastern Bristlebird	EN	EN		#	Low	Suitable habitat not present	Found in coastal woodlands, dense scrub and heathlands, particularly where it borders taller woodlands.
Diomedea antipodensis	Antipodean Albatross	VU	VU		#	Low	Suitable habitat not present	A marine pelagic species rarely visiting Australia.
Diomedea antipodensis gibsoni	None	VU			#	Low	Suitable habitat not present	A marine pelagic species which breeds on the Auckland islands, New Zealand.
Diomedea epomophora	Royal Albatross	VU			#	Low	Suitable habitat not present	During the non-breeding season, it has a wide and possibly circumpolar distribution, ranging north to about 35°S. The Royal

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								Albatross is moderately common throughout the year in offshore waters of southern Australia, mostly off southeastern NSW.
Diomedea exulans	Wandering Albatross	VU	EN		1992#	Low	Suitable habitat not present	A marine, pelagic and aerial species. Versatile feeders in pelagic and shelf waters. Breed on subantarctic and Antarctic islands.
Diomedea sanfordi	Northern Royal Albatross	EN			#	Low	Suitable habitat not present	The Northern Royal Albatross ranges widely over the Southern Ocean, with individuals seen in Australian waters off south-eastern Australia.
Fregetta grallaria grallaria	White-bellied storm petrel	VU	VU		#	Low	Suitable habitat not present	The White-bellied Storm-Petrel (Tasman Sea) breeds on small offshore islets.
Glossopsitta pusilla	Little Lorikeet		VU		2019	Low	Suitable habitat not present	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 m and 15 m, mostly in living, smooth-barked eucalypts. Most breeding records come from the western slopes.
Grantiella picta	Painted Honeyeater	VU	VU		#	Low	Suitable habitat not present	Found mainly in dry open woodlands and forests, where it is strongly associated with mistletoe. Often found on plains with scattered eucalypts and remnant trees on farmlands.
Haematopus fuliginosus	Sooty Oystercatcher		VU		2013	Low	Suitable habitat not present	The Sooty Oystercatcher is found on undisturbed tidal rocks on ocean shores and islands. Occasionally it is observed on sandpits and mudflats. It forages on exposed rock or coral at low tide for limpets and mussels. The Sooty Oystercatcher breeds in spring and summer almost exclusively offshore or on isolated promontories

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
Haematopus longirostris	Pied Oystercatcher		EN		2001	Low	Suitable habitat not present	An intertidal forager found on undisturbed sandy beaches and spits, tidal mudflats and estuaries. Its food supply (beach macroinvertebrates) have been negatively affected by human impacts. The Pied Oystercatcher is restricted to the littoral zone of beaches and estuaries, nesting on the ground above the tideline. A pair will re-nest in the same spot each year, rarely shifting their territory. Occasionally the Pied Oystercatcher is found in paddocks near the coast.
Haliaeetus leucogaster	White-bellied Sea-Eagle		VU		2019	Low	Suitable habitat not present	A migratory species that is generally sedentary in Australia, although immature individuals and some adults are dispersive. Found in terrestrial and coastal wetlands; favouring deep freshwater swamps, lakes and reservoirs; shallow coastal lagoons and saltmarshes. It hunts over open terrestrial habitats. Feeds on birds, reptiles, fish, mammals, crustaceans and carrion. Roosts and makes nest in trees.
Hieraaetus morphnoides	Little Eagle		VU		2016	Low	Suitable habitat not present	The Little Eagle is most abundant in lightly timbered areas with open areas nearby providing an abundance of prey species. It has often been recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. The Little Eagle nests in tall living trees within farmland, woodland and forests.
Hirundapus caudacutus	White-throated Needletail	VU			2018#	Low	Suitable habitat not present	An aerial species found in feeding concentrations over cities, hilltops and timbered ranges. Breeds in Asia.
Ixobrychus flavicollis	Black Bittern		VU		2019	Low	Suitable habitat not present	The Black Bittern is found along the coastal plains within NSW, although individuals have rarely being recorded south of Sydney or inland. It inhabits terrestrial and estuarine wetlands such as flooded grasslands, forests, woodlands, rainforests and mangroves with

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								permanent water and dense waterside vegetation. The Black Bittern typically roosts on the ground or in trees during the day and forages at night on frogs, reptiles, fish and invertebrates. The breeding season extends from December to March. Nests are constructed of reeds and sticks in branches overhanging the water.
Lathamus discolor	Swift Parrot	CR	EN		2019#	Low	Suitable habitat not present	The Swift Parrot occurs in woodlands and forests of NSW from May to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW. Favoured feed trees include winter flowering species such as Swamp Mahogany *Eucalyptus robusta*, Spotted Gum *Corymbia maculata*, Red Bloodwood *C. gummifera*, Mugga Ironbark *E. sideroxylon*, and White Box *E. albens*. Commonly used lerp infested trees include Grey Box *E. microcarpa*, Grey Box *E. moluccana* and Blackbutt *E. pilularis*. This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability.
Limosa lapponica baueri	Bar-tailed Godwit (baueri)	VU			#	Low	Suitable habitat not present	The bar-tailed godwit (western Alaskan) occurs mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It has also been recorded in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats.
Limosa lapponica menzbieri	None	CR			#	Low	Suitable habitat not present	The bar-tailed godwit (northern Siberian) occurs mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It has also been recorded in coastal sewage farms and saltworks, saltlakes and brackish

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
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								wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats.
Lophoictinia isura	Square-tailed Kite		VU		2016	Low	Suitable habitat not present	Typically inhabits coastal forested and wooded lands of tropical and temperate Australia. In NSW it is often associated with ridge and gully forests dominated by *Eucalyptus longifolia*, *Corymbia maculata*, *E. elata*, or *E. smithii*. Individuals appear to occupy large hunting ranges of more than 100 km^2. They require large living trees for breeding, particularly near water with surrounding woodland /forest close by for foraging habitat. Nest sites are generally located along or near watercourses, in a tree fork or on large horizontal limbs.
Macronectes giganteus	Southern Giant Petrel	EN	EN		1999#	Low	Suitable habitat not present	The Southern Giant-Petrel is a marine species found throughout the Antarctic to subtropical waters occasionally venturing to inshore waters.
Macronectes halli	Northern Giant-Petrel	VU	VU		#	Low	Suitable habitat not present	Marine, pelagic species found mainly in subantarctic waters.
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)		VU		2015	Low	Suitable habitat not present	Found mostly in open forests and woodlands dominated by box and ironbark eucalypts. It is rarely recorded east of the Great Dividing Range.
Ninox connivens	Barking Owl		VU		2019	Low	Suitable habitat not present	Generally found in open forests, woodlands, swamp woodlands, farmlands and dense scrub. Can also be found in the foothills and timber along watercourses in otherwise open country. Territories are typically 2000 ha in NSW habitats. Hunts small arboreal mammals or birds and terrestrial mammals when tree hollows are absent.

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		EPBC	BC	FM				
Ninox strenua	Powerful Owl		VU		2020	Low	Suitable habitat not present	The Powerful Owl occupies wet and dry eucalypt forests and rainforests. It may inhabit both un-logged and lightly logged forests as well as undisturbed forests where it usually roosts on the limbs of dense trees in gully areas. Large mature trees with hollows at least 0.5 m deep are required for nesting. Tree hollows are particularly important for the Powerful Owl because a large proportion of the diet is made up of hollow-dependent arboreal marsupials. Nest trees for this species are usually emergent with a diameter at breast height of at least 100 cm. It has a large home range of between 450 and 1450 ha.
Numenius madagascariensis	Eastern Curlew	CR			2004#	Low	Suitable habitat not present	Occurs in sheltered coasts, especially estuaries, embayments, harbours, inlets and coastal lagoons with large intertidal mudflats or sandflats often with beds of seagrass.
Onychoprion fuscata	Sooty Tern		VU		2013	Low	Suitable habitat not present	The Sooty Tern is a pelagic species found over tropical waters were it feeds offshore far away from land. It breeds off the coast of WA and QLD rarely venturing to the south-east of Australia.
Pachyptila turtur subantarctica	None	VU			#	Low	Suitable habitat not present	Fairy Prions (including other subspecies) are often beachcast on the south-eastern coast of Australia, and are commonly seen offshore over the continental shelf and over pelagic waters. Observations are less common off Western Australia and Queensland than in south-eastern Australia. Beachcast birds are found along the whole coast of NSW, and the species is common offshore along the entire Victorian coast, where thousands are sometimes seen. In Tasmania, the Fairy Prion is an abundant visitor to all offshore waters. In South Australia, this species is regularly seen and often beachcast.

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
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Pandion cristatus	Eastern Osprey		VU		2019#	Low	Suitable habitat not present	Found in coastal waters, inlets, estuaries and offshore islands. Occasionally found 100 km inland along larger rivers. It is water-dependent, hunting for fish in clear, open water. The Osprey occurs in terrestrial wetlands, coastal lands and offshore islands. It is a predominantly coastal species, generally using marine cliffs as nesting and roosting sites. Nests can also be made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.
Petroica boodang	Scarlet Robin		VU		2019	Low	Suitable habitat not present	The Scarlet Robin inhabits dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. During autumn and winter it moves to more open and cleared areas. The Scarlet Robin forages amongst logs and woody debris for insects. The nest is an open cup of plant fibres and cobwebs, sited in the fork of a tree.
Phoebetria fusca	Sooty Albatross	VU	VU		#	Low	Suitable habitat not present	A pelagic species that inhabits subantarctic and subtropical marine waters.
Pterodroma leucoptera leucoptera	Gould's Petrel	EN	VU		#	Low	Suitable habitat not present	The Gould's Petrel is a marine species which only comes to shore to breed. It breeds exclusively on Cabbage Tree Island, 1.4 km offshore from Port Stephens and on nearby Boondelbah Island. The first arrival of Gould's petrel on cabbage tree Island occurs from mid to late September. Fledglings depart the island from late March to early May.
Pterodroma neglecta neglecta	Kermadec Petrel (west Pacific subspecies)	VU	VU		#	Low	Suitable habitat not present	Marine pelagic, in subtropical and tropical waters. They breed on islands, atolls and rock cliff where they nest on the ground or in rock crevices under ferns, shrubs or trees. Forage far away from breed sites.

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		EPBC	BC	FM				
Ptilinopus magnificus	Wompoo Fruit-Dove		VU		1985	Low	Suitable habitat not present	Mainly occurs in large undisturbed patches of tall tropical or subtropical rainforest. Occasionally occurs in patches of monsoon forest, closed gallery forest, wet sclerophyll forest, tall open forest, open woodland or vine thickets near rainforest.
Ptilinopus regina	Rose-crowned Fruit-Dove		VU		2019	Low	Suitable habitat not present	Occurs in tall tropical and subtropical, evergreen or semi-deciduous rainforest, especially with dense growth of vines. Prefers large patches of rainforest, but sometimes occurs in remnant patches surrounded by suboptimal habitat including farmlands.
Ptilinopus superbus	Superb Fruit-Dove		VU		2017	Low	Suitable habitat not present	The Superb Fruit Dove ranges from northern NSW to as far south as Moruya. It is found in rainforests, closed forests (including mesophyll vine forests) and sometimes in eucalypt and acacia woodlands with fruit-bearing trees. It forages in the canopy of fruiting trees such as figs and palms.
Rostratula australis	Australian Painted Snipe	EN	EN		2012#	Low	Suitable habitat not present	Usually found in shallow inland wetlands including farm dams, lakes, rice crops, swamps and waterlogged grassland. They prefer freshwater wetlands, but have been recorded in brackish waters. Forages on mud-flats and in shallow water. Feeds on worms, molluscs, insects and some plant-matter.
Sternula albifrons	Little Tern		EN		#	Low	Suitable habitat not present	The Little Tern favours sheltered coasts, harbours, bays, lakes, inlets, estuaries, coastal lagoons and ocean beaches especially with sand-spits and sand islets. It forages over shallow waters close inshore or over sandbars and reefs.
Sternula nereis nereis	Fairy Tern	VU			#	Low	Suitable habitat not present	The Fairy Tern nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. This species will also

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
		EPBC	BC	FM				
								frequent embayments, estuarine habitats, wetlands and mainland coastlines.
Thalassarche bulleri	Buller's Albatross	VU			#	Low	Suitable habitat not present	A marine pelagic species rarely visiting Australia.
Thalassarche cauta	Shy Albatross	VU	VU		1997#	Low	Suitable habitat not present	The Shy Albatross is a marine pelagic species inhabiting sub-antarctic and subtropical waters, spending the majority of their time at sea. Occasionally it is observed in continental shelf waters in bays and harbours.
Thalassarche cauta steadi	White-capped Albatross	VU			#	Low	Suitable habitat not present	The White-capped Albatross is probably common off the coast of south-east Australia throughout the year. It has been observed that juveniles are rare in New Zealand waters, being more common off south-east Australia and South Africa. Breeding colonies occur on islands south of New Zealand.
Thalassarche chrysostoma	Grey-headed Albatross	EN			1986	Low	Suitable habitat not present	A marine pelagic species which visits Australian subtropical waters during winter. Only ventures near the coast during rough conditions.
Thalassarche eremita	Chatham Albatross	EN			#	Low	Suitable habitat not present	The Chatham Albatross is a medium sized albatross, with a wing-span less than 2.1 m. The bright yellow bill has a distinctive black spot near the tip of the lower mandible, allowing discrimination from the similar Shy Albatross. Breeding for the Chatham Albatross is restricted to Pyramid Rock, Chatham Islands, off the coast of New Zealand. The principal foraging range for this species is in coastal waters off eastern and southern New Zealand, and Tasmania.

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Thalassarche impavida	Campbell Albatross	VU			#	Low	Suitable habitat not present	Inhabits Antarctic, subantarctic and subtropical waters.
Thalassarche melanophris	Black-browed Albatross	VU	VU		1999#	Low	Suitable habitat not present	Inhabits Antarctic, subantarctic and subtropical waters. Although generally pelagic the species also occurs on the continental shelf and can be seen from land.
Thalassarche salvini	Salvin's Albatross	VU			#	Low	Suitable habitat not present	Salvin's Albatross is a non-breeding visitor to Australian waters.
Tyto novaehollandiae	Masked Owl		VU		2015	Low	Suitable habitat not present	The Masked Owl is found in range of wooded habitats that provide tall or dense mature trees with hollows suitable for nesting and roosting. It is mostly seen in open forests and woodlands adjacent to cleared lands. Prey includes hollow-dependent arboreal marsupials and terrestrial mammals.
Xenus cinereus	Terek Sandpiper		VU		2012	Low	Suitable habitat not present	Mainly found on saline intertidal mudflats in sheltered estuaries, embayments, harbours and lagoons.
Frogs								
Heleioporus australiacus	Giant Burrowing Frog	VU	VU		2020#	Low	Suitable habitat not present	Prefers hanging swamps on sandstone shelves adjacent to perennial non-flooding creeks. Can also occur within shale outcrops within sandstone formations. Known from wet and dry forests and montane woodland in the southern part range. Individuals can be found around sandy creek banks or foraging along ridge-tops during or directly after heavy rain. Males often call from burrows located in

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		EPBC	BC	FM				
								sandy banks next to water. Spends the majority of its time in non-breeding habitat 20-250m from breeding sites.
Litoria aurea	Green and Golden Bell Frog	VU	EN		1997#	Low	Suitable habitat not present	The species is found in marshes, dams and stream sides, particularly those containing bulrushes or spikerushes. Preferred habitat contains water bodies that are unshaded, are free of predatory fish, have a grassy area nearby and have diurnal sheltering sites nearby such as vegetation or rocks, although the species has also been recorded from highly disturbed areas including disused industrial sites, brick pits, landfill areas and cleared land. Breeding usually occurs in summer. Tadpoles, which take approximately 10-12 weeks to develop, feed on algae and other vegetative matter. Adults eat insects as well as other frogs, including juveniles of their own species.
Litoria littlejohni	Littlejohn's Tree Frog	VU	VU		#	Low	Suitable habitat not present	The species is distributed along the eastern slopes of the Great Dividing Range from Watagan State Forest near Wyong, south to Buchan in north-eastern VIC. It is not known from coastal habitats. Occurs in wet and dry sclerophyll forests and heath communities associated with sandstone outcrops between 280 and 1000 m. Littlejohn's Tree Frog prefers permanent and semi-permanent rock flowing streams, but individuals have also been collected from semi-permanent dams with some emergent vegetation. Forages both in the tree canopy and on the ground, and has been observed sheltering under rocks on high exposed ridges during summer. The species breeds in autumn but will also breed after heavy rainfall in spring and summer. The species has been recorded calling in all seasons with variously reported peak calling periods. Eggs are laid in loose gelatinous masses attached to submerged twigs; eggs and

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								tadpoles are most often recorded in slow-flowing pools that receive extended exposure to sunlight.
Mixophyes balbus	Stuttering Frog	VU	EN		#	Low	Suitable habitat not present	This species is usually associated with mountain streams, wet mountain forests and rainforests. It rarely moves very far from the banks of permanent forest streams, although it will forage on nearby forest floors. Eggs are deposited in leaf litter on the banks of streams and are washed into the water during heavy rains.
Pseudophryne australis	Red-crowned Toadlet		VU		2020	Low	Suitable habitat not present	Occurs on wetter ridge tops and upper slopes of sandstone formations on which the predominant vegetation is dry open forests and heaths. This species typically breeds within small ephemeral creeks characterised by a series of shallow pools that feed into larger semi-perennial streams.
Fish								
Carcharias taurus (east coast population)	Grey Nurse Shark	CR			#	Negligible	Habitat not present	Grey nurse sharks are often observed just above the sea bed in or near deep sandy-bottomed gutters or rocky caves, in the vicinity of inshore rocky reefs and islands. The diet of the adult grey nurse shark consists of a wide range of fish, other sharks, squids, crabs and lobsters
Carcharodon carcharias	Great White Shark	VU		VU	#	Negligible	Habitat not present	Great White Sharks have been sighted in all coastal areas except in the Northern Territory. The species is typically found from close inshore habitats (e.g. rocky reefs and shallow coastal bays) to the outer continental shelf and slope areas. Juveniles appear to aggregate seasonally in certain key areas including the 90 Mile Beach area of eastern Victoria and the coastal region between Newcastle and Forster in NSW.

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Epinephelus daemelii	Black Cod	VU		VU	#	Negligible	Habitat not present	*Epinephelus daemelii* has been recorded from the temperate and subtropical waters of the southwestern Pacific: Australia, Norfolk Island, Kermadec Islands and New Zealand (North Island and Poor Knights Island). The Australian range extends from southern Queensland to Kangaroo Island off South Australia.
Macquaria australasica	Macquarie Perch	EN		EN	#	Negligible	Habitat not present	Macquarie Perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury and Shoalhaven catchments. Macquarie perch are found in both river and lake habitats, especially the upper reaches of rivers and their tributaries
Prototroctes maraena	Australian Grayling	VU		EN	#	Negligible	Habitat not present	The Australian Grayling occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range from Sydney southwards to the Otway Ranges in Victoria, and Tasmania. Australian grayling do not occur in the inland Murray–Darling Basin system. Grayling is a diadromous species; migrating between freshwater streams and the ocean. This species has been found in clear, gravel-bottomed streams with alternating pools and riffles, and granite outcrops, and also in muddy-bottomed, heavily silted habitats.
Rhincodon typus	Whale Shark	VU			#	Negligible	Habitat not present	Whale sharks have a broad distribution in tropical and warm temperate seas, usually between latitudes 30°N and 35°S. They are known to inhabit both deep and shallow coastal waters and the lagoons of coral atolls and reefs. Sightings have been confirmed at Eden (on the NSW south coast).
Reptiles								

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
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Caretta caretta	Loggerhead Turtle	EN	EN		2017#	Negligible	Habitat not present	In Australia, the Loggerhead Turtle occurs in the waters of coral and rocky reefs, seagrass beds and muddy bays throughout eastern, northern and western Australia. In eastern Australia, there is evidence that they spend around 15 years or more in the open ocean, with much of their feeding in the top 5 m of water, before recruiting to their chosen inshore or neritic feeding area. Loggerhead Turtles choose a wide variety of tidal and sub-tidal habitat as feeding areas and show fidelity to both their foraging and breeding areas.
Chelonia mydas	Green Turtle	VU	VU		2013#	Negligible	Habitat not present	Marine species with a pan-tropical distribution throughout the world. More abundant along the tropical coasts of Australia and the Great Barrier Reef. Green Turtles spend their first five to ten years drifting on ocean currents. During this pelagic (ocean-going) phase, they are often found in association with driftlines and rafts of Sargassum (a floating marine plant that is also carried by currents). Once Green Turtles reach 30 to 40 cm curved carapace length, they settle in shallow benthic foraging habitats such as tropical tidal and sub-tidal coral and rocky reef habitat or inshore seagrass beds. The shallow foraging habitat of adults contains seagrass beds or algae mats on which Green Turtles mainly feed.
Dermochelys coriacea	Leatherback Turtle	EN	EN		#	Negligible	Habitat not present	Marine species usually sighted along the eastern seaboard often in bays, estuaries and rivers. Some nesting has occurred in northern NSW near Ballina. However, no nesting has occurred in Queensland or NSW since 1996. Diet is dominated by gelatinous organisms such as jellyfish, salps, squid and siphonophores.
Eretmochelys imbricata	Hawksbill Turtle	VU			#	Negligible	Habitat not present	Hawksbill Turtles spend their first five to ten years drifting on ocean currents. During this pelagic (ocean-going) phase, they are often found in association with rafts of Sargassum (a floating marine plant

Scientific name	Common name	Conservation status			Most recent record	Likely occurrence in study area	Rationale for likelihood ranking	Habitat description*
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								that is also carried by currents). Once Hawksbill Turtles reach 30 to 40 cm curved carapace length, they settle and forage in tropical tidal and sub-tidal coral and rocky reef habitat. They primarily feed on sponges and algae.
Hoplocephalus bungaroides	Broad-headed Snake	VU	EN		#	Low	Suitable habitat not present	Mainly occurs in association with communities occurring on Triassic sandstone within the Sydney Basin. Typically found among exposed sandstone outcrops with vegetation types ranging from woodland to heath. Within these habitats they generally use rock crevices and exfoliating rock during the cooler months and tree hollows during summer.
Varanus rosenbergi	Rosenberg's Goanna		VU		2020	Low	Suitable habitat not present	This species is a Hawkesbury/Narrabeen sandstone outcrop specialist. Occurs in coastal heaths, humid woodlands and both wet and dry sclerophyll forests. Termite mounds are a critical habitat component.

* - habitat descriptions have been adapted by qualified ecologists from the DEE Species Profile and Threats (SPRAT) Database, OEH Threatened Species online profiles and the NSW Scientific Committee final determinations for listed species, references within the above table are provided within the report reference list.