



Bark Hut Road Ecological Assessment

Final Report
August 2018

Keiley Hunter Urban Planner



Glossary, acronyms and abbreviations

BC Act	<i>Biodiversity Conservation Act 2016</i>
APZ	Asset Protection Zone
BC Act	<i>Biodiversity Conservation Act 2016</i>
CHCC	Coffs Harbour City Council
CHLC	Coffs Harbour Landscape Corridors
CKPoM	Comprehensive Koala Plan of Management
CZMP	Coastal Zone Management Plan
DCP	Development Control Plan
EEC	Endangered ecological community
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
HVH	High valued habitat
LEP	Local Environment Plan
OEH	Office of Environment and Heritage
PCT	Plant community type
SAT	Spot assessment technique
TEC	Threatened Ecological Community
TSC Act	<i>Threatened Species Conservation Act 1995</i>
VMP	Vegetation Management Plan

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1 Introduction

1.1 Overview

Keiley Hunter Urban Planner engaged Ecosure Pty Ltd (Ecosure) to conduct an ecological assessment of Lot 202 DP874273 (the site), being two parcels of land in Woolgoolga, west of the Pacific Highway, 30 km north of Coffs Harbour, New South Wales. The northern precinct of the land borders Bark Hut Road (16.41 ha) while the southern precinct borders Newmans Road (9.23 ha) (Figure 1). The assessment is necessary in order to meet state and local government requirements for a re-zoning application for the subject land. The concept design for the preliminary proposal for re-zoning is provided as Appendix 1.

The *Biodiversity Conservation Act 2016* (BC Act) commenced on 25 August 2017 with transitional provisions until 25 November 2017. Under Part 7 of the BC Act (Savings and Transitional) Regulation 2017, Council can assess DAs under the former planning provisions. Accordingly, this report has been prepared in accordance with the threatened species impact assessment requirements under Section 94 of the *Threatened Species Conservation Act 1995* (TSC Act).

The project scope included:

- a literature review which included findings from the constraints analysis (Ecosure 2016a), recommendations from the Northern Councils Review of Environmental Zonings (DPE 2015), and relevant Coffs Harbour City Council (CHCC) Local Environment Plan (LEP), Development Control Plan (DCP), policies and guidelines
- an assessment of fauna habitat particularly for threatened fauna species likely to occur based on findings from the constraints analysis (including identification of landscape features such as dry slopes and wet areas, features that could provide habitat including dead wood and dead trees, identification of hollow-bearing trees, searches for distinctive scats and scratches on trees, and identification of nests and assessment of culverts and drainage lines)
- a modified koala Spot Assessment Technique (SAT) survey targeting primary koala feed trees if they occur on-site and a review of mapped koala habitat including the consideration of Council's Comprehensive Koala Plan of Management (CKPoM)
- a flora assessment that ground-truthed vegetation communities in accordance with NSW Plant Community Types (PCTs) and Council's fine scale vegetation mapping (OEH 2012a).
- a targeted search for threatened flora species identified as potentially occurring on the site
- detailed mapping identifying potential E3 – Environmental Management zoned land

- an assessment of potential habitat linkages associated with the subject area

1.2 Site description

The subject area falls within the North Coast Bioregion and the Coffs Coast and Escarpment Interim Biogeographic Regionalisation of Australia sub-region. The eastern boundary is located approximately 1 km from the eastern seaboard and would be influenced by the maritime environment depending on wind direction and speed. The land is gently sloping, rarely exceeding 10 degrees. There are no major landscape features associated with the site, such as karst, caves, crevices, cliffs and areas of geological significance.

The project area is mostly cleared with scattered patches of vegetation. Small patches of dry sclerophyll forest are present in both the northern and southern precincts with wet sclerophyll forest only present in the southern precinct. Poundyard Creek flows just to the north of the southern precinct (Figure 1) although the stream and its banks fall outside the lot boundaries of the subject area.


Throughout the remainder of this report the two study areas are referred to as the southern and northern precincts. They are geographically separated by Poundyard Creek and council owned land currently being developed for the purposes of a community sports field. The western boundary of the northern precinct is bounded by Solitary Islands Way (old Pacific Highway) while the entry to the southern precinct adjoins Newmans Road as part of west Woolgoolga.



Figure 1: Site location

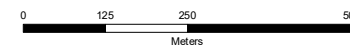
Keiley Hunter Urban Planner

Bark Hut Road EA

 Project area (202 DP874273)



Job number: PR2836
 Revision: 0
 Author: DJB, KF
 Date: 10/05/2018



GDA 1994 MGA Zone 56
 Projection: Transverse Mercator
 Datum: GDA 1994
 Units: Meter

2 Methods

2.1 Literature review

The following information was reviewed:

- previous reports including Bark Hut Road Planning Proposal-Environmental Investigation Report (Ecosure 2016a) and Bark Hut Road Lesser Swamp-orchid (Ecosure 2016b)
- relevant biodiversity databases (i.e. NSW BioNet and the EPBC Act Protected Matters Search) for flora and fauna records
- vegetation community mapping data (OEH 2012a)
- plant community types (OEH 2017) and fine-scale vegetation mapping (OEH 2012b)
- preliminary layout design plan (Appendix 1)
- review of relevant legislation, plans and policies including relevant sections of the CHCC LEP (CHCC 2013) and the Coffs Harbour Comprehensive Koala Plan of Management (CHCC 1999).
- review of Landscape Corridors of the Coffs Harbour Local Government Area (CHCC 2015)
- Northern beaches kangaroo management plan (CHCC 2017)
- Woolgoolga Lake Estuary Coastal Zone Management Plan (GeoLink 2013).

2.2 Flora assessment

Flora surveys were undertaken in the northern precinct on the 25th September 2017 and 9th October and in the southern precinct on 3rd November 2017. Sampling of the site involved the “random meander” transect method (Cropper 1993) and targeted sampling within each mapped vegetation community area. Mapped vegetation communities were ground truthed and dominant species within each vegetation patch were assessed and matched to NSW Office of Environment and Heritage (OEH) PCTs. Vegetation was also matched against vegetation community profiles within the *Development of a Fine-scale vegetation map for the Coffs Harbour local government area volume 2: vegetation community profiles* (OEH 2012b).

A GPS enabled digital tablet was used to compare the location of existing mapped ecosystems to the communities occurring in the field. Where differences between mapped and actual ecosystems were observed, the ground truthed communities were mapped and used to produce an updated vegetation communities map. Targeted searches for threatened flora species within each vegetation community were undertaken.

The areas that did not contain native vegetation (i.e. land not included in native vegetation extent) required no further assessment.

2.3 Fauna habitat assessment including modified SAT

Fauna habitat and opportunistic fauna sightings were recorded within and adjacent to the site as follows:

- Opportunistic fauna sightings were recorded throughout the day.
- Targeted assessments for threatened fauna and associated fauna habitat were undertaken with a particular focus on koala feed tree species and hollow-bearing trees.
- Modified SAT surveys were conducted in areas of remnant vegetation in the northern and southern precincts. For each area, 25 trees were surveyed for a period of two minutes per tree to determine presence/absence of koala scat.
- Populations of the eastern kangaroo (*Macropus giganteus*) were estimated in the southern and northern precincts.

2.4 Bushfire threat analysis

The proposed design layout (Appendix 1) was reviewed to determine potential location of infrastructure including roads and building envelopes. Vegetation and slope were inspected on 25th September to make a preliminary determination of bushfire threat associated with the proposed layout design.

The vegetation assessment associated with this report will be used to inform a comprehensive bushfire report being prepared by Holiday Coast Bushfire Solutions.

3 Results

3.1 Literature review

Various reports, databases, and maps were reviewed to gain an understanding of the characteristics of the site and potential environmental constraints.

Previous reports

Findings from the desktop constraints analysis (Ecosure 2016a) and the targeted survey for the southern swamp-orchid (*Phaius australis*) (Ecosure 2016b) identified the following:

- the majority of the site is considered to be of low ecological value. An area in the north and northwestern part of the southern precinct is considered of high ecological value
- patches of vegetation scattered throughout both parcels are considered of medium ecological value
- secondary and tertiary koala habitat is mapped on the site
- riparian areas and areas of high ecological value should be retained.

A summary of potential environmental constraints was provided and indicated that no high valued habitats have been mapped on the site (Ecosure 2016a) (Table 1).

Table 1 Potential environmental constraints (only those applicable to the site have been included)

Operational Layer	Result		Details
Coffs Harbour City LEP 2013	Natural resource waterways	n/a	Drainage line associated with Poundyard Creek flows to the north of the southern precinct of Lot 20 2DP874273
	Land zoning	RU2	Rural landscape
	Potential Acid Sulphate Soils	Class 4 Class 3	Northern precinct - south east corner Southern precinct - northern tip Southern precinct – along northern border
Constraints	Acid Sulphate Soils	Class 5 Class 4	Northern and southern precincts Southern precinct - north western tip
	Koala Habitat	Secondary	Northern and southern precincts contain some patches
		Tertiary	Northern precinct – a patch in the north west and in the southern end
	SEPP71 Coastal Policy	yes	Relevant to both northern and southern precincts
Bushfire mapping	prone Fire Prone Vegetation Categories	Category 1	Northern precinct Tip of southern precinct
		Category 2	Northern precinct
	Fire Prone Vegetation Buffers	30m buffer	Northern precinct
		100m buffer	Northern and southern precincts

Operational Layer	Result		Details
Flooding information	Flood planning area	Yes	Northern precinct – south east Southern precinct – northern tip
	AEP flood extents	Yes	Southern precinct – along northern border
Coffs Harbour Fine Scale Vegetation Mapping	Dry sclerophyll forests	Yes	Northern precinct (CH_DOF05)
	Remnant native vegetation	Yes	Northern precinct (CH_NRV01) Southern precinct (CH_NRV01)
	Wet sclerophyll forests	Yes	Southern precinct (CH_WSF01)
High Valued Habitats (HVH)	Endangered ecological communities (EECs)	n/a	Likely EECs are mapped to occur within one (1) km of project area however no EEC are mapped to occur within the project area

A targeted survey for the southern swamp-orchid, determined to potentially occur on the site, did not locate the species nor was any potential habitat for the species identified on the site (Ecosure 2016b). Vegetation mapping by OEH identifies four communities within the site (Figure 2).

3.2 NSW BioNet and EPBC Act Protected Matters Searches

A search of NSW BioNet records within 5 km of the site returned 47 species listed as threatened under the *Biodiversity Conservation Act 2016* (BC Act), (Appendix 2). A 5 km *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Protected Matters search returned 73 threatened species and 51 migratory species Appendix 3).

The EPBC search also returned three threatened ecological communities (TECs).

As the NSW BioNet search returns actual records of threatened species (while the EPBC Act Protected Matters Search returns all species possibly occurring), only the BioNet records have been included and discussed in relation to their likelihood of occurrence (Table 2 and Table 3). It should be noted that this analysis excludes species found in the ocean (e.g. whale, turtle, etc.) and marine dependent birds. Locations of threatened species records are mapped in Figure 3.

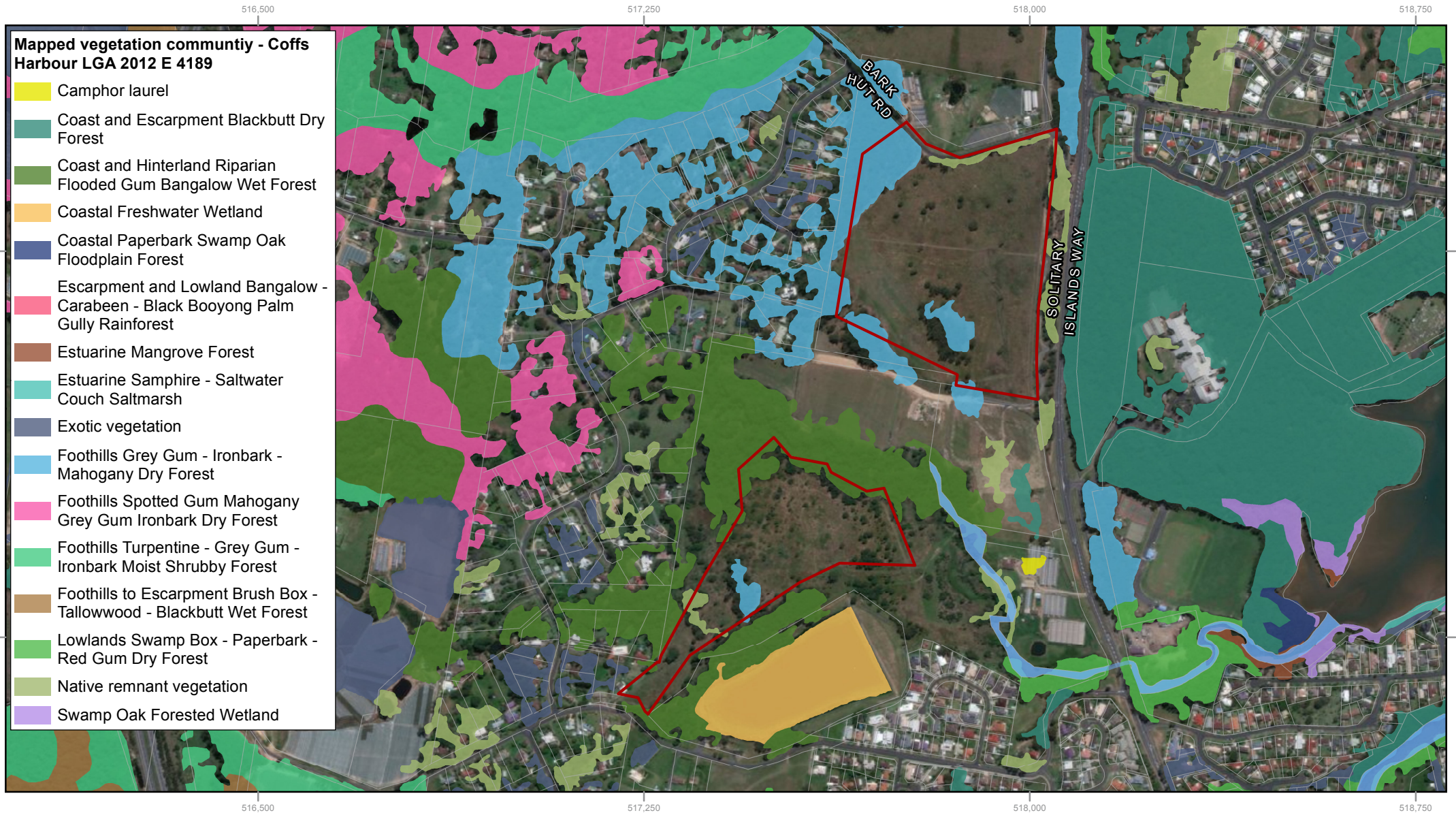




Figure 2: Plant community types

Keiley Hunter Urban Planner
Bark Hut Rd EA

 Project area (202 DP874273)
 Property boundary



Job number: PR2836
Revision: 0
Author: DJB
Date: 10/11/2017



0 50 100 200
Metres

GDA 1994 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 1994
Units: Meter

Table 2 Likelihood of occurrence of threatened flora species recorded within 5 km of the site

Scientific name	Common name	EPBC Act status	BC Act status	Likelihood of occurrence	Potential site impacts
<i>Hicksbeachia pinnatifolia</i>	red boppel nut	V	V	Unlikely. Occurs in rainforest habitat which is not mapped within the site.	Very minimal, unlikely to occur within development footprint
<i>Macadamia tetraphylla</i>	rough-shelled bush nut	V	V	Unlikely. Occurs in rainforest habitat which is not mapped within the site.	Very minimal, unlikely to occur within development footprint
<i>Marsdenia longiloba</i>	slender marsdenia	V	E	Possible. Associated with vegetation community CH_WSF01 which is mapped to occur within the project area.	Minimal, species likely to occur outside the development footprint
<i>Niemeyera whitei</i>	rusty plum, plum boxwood		V	Possible. Associated with vegetation community CH_WSF01 which is mapped to occur within the project area. Despite a record in the northern precinct, targeted searches did not record this species.	Minimal, species likely to occur outside the development footprint
<i>Phaius australis</i>	southern swamp orchid	E	E	Possible, but only in flood prone areas of Poundyard Creek. This species has been heavily impacted by illegal collection.	Minimal, not likely to occur within the development footprint.

Key: BC Act: E1 Endangered, P Protected, V Vulnerable

EPBC: E Endangered, V Vulnerable

Table 3 Likelihood of occurrence of threatened fauna species recorded within 5 km of the site

Class	Scientific name	Common name	EPBC Act status	BC Act status	Likelihood of occurrence	Potential site impacts
Amphibia	<i>Mixophyes iteratus</i>	giant barred frog	E	E1	Unlikely Found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation. Generally associated with deep leaf litter for shelter and foraging.	There are no permanent streams or creeks associated with either the southern or northern precincts so the proposal is very unlikely to have any impact on this frog. Surveys may locate this species in Poundyard Creek but appropriate sediment and erosion control measures will mitigate any impacts on the creek.
Birds	<i>Ephippiorhynchus asiaticus</i>	black-necked stork		E1	Unlikely. More likely associated with estuarine areas further to the east and large dam to the east of the southern precinct. There is a single record east of the southern precinct near the large council dam.	Negligible, there is no suitable habitat available for the black-necked stork.
Birds	<i>Ardea ibis</i>	cattle egret	C,J (migratory)		Possible. Occurs in tropical and temperate grasslands and woodlands which is mapped to occur within project area.	Negligible, there is no suitable habitat available for the cattle egret.
Birds	<i>Hirundapus caudacutus</i>	white-throated needletail	C,J,K		Possible. High flying species occurring in Australia only between late spring and early autumn. The species is unlikely to be recorded perching but may be seen above the subject site.	Negligible, the species is almost exclusively aerial in Australia over a wide range of habitats.
Birds	<i>Stictonetta naevosa</i>	freckled duck		V	Unlikely. More likely associated with estuarine areas further to the east and large dam to the east of the southern precinct.	Negligible, there is no suitable habitat available for the duck in either the northern or southern precinct although suitable waterbodies occur to the east of the site.
Birds	<i>Ptilinopus magnificus</i>	wompoo fruit-dove		V	Possible. May occur in wet sclerophyll forest within Poundyard Creek but unlikely to occur within the northern and southern precincts.	Negligible, this dove generally prefers high quality habitat including rainforest, neither of which occurs on site.
Birds	<i>Ixobrychus flavicollis</i>	black bittern		V	Unlikely. More likely associated with estuarine areas further to the east and large dam to the east of the southern precinct.	Negligible, there is no suitable habitat available for the bittern in either the northern or southern precinct. Adjoining council land associated with Poundyard Creek may have some suitable habitat.

Class	Scientific name	Common name	EPBC Act status	BC Act status	Likelihood of occurrence	Potential site impacts
Birds	<i>Haliaeetus leucogaster</i>	white-bellied sea-eagle		V	Likely. Found in coastal habitats and may be flying over the project area.	The sea-eagle may be an itinerant visitor to the subject site as there are known nesting pairs further to the east along the coast, however, there are no large water bodies associated with the site which would provide suitable foraging habitat. Similarly, there are no large tree stags for nesting.
Birds	<i>Lathamus discolor</i>	swift parrot	CE	E	Possible. Occurs on the coast and inhabits dry sclerophyll eucalypt forest which is mapped to occur within project area.	All consolidated areas of remnant vegetation will be retained within both precincts, limiting any impact on the foraging resources of this parrot.
Birds	<i>Grus rubicunda</i>	brolga		V	Unlikely. Occurs in open grassland habitat including pasture which is mapped to occur within the project area.	Negligible, there is no suitable habitat available for the brolga in either the northern or southern precinct although suitable waterbodies occur to the east of the site.
Birds	<i>Irediparra gallinacea</i>	comb-crested jacana		V	Unlikely. More likely associated with estuarine areas further to the east and large dam to the east of the southern precinct.	Negligible, there is no suitable habitat available for the jacana in either the northern or southern precinct although suitable waterbodies occur to the east of the site.
Birds	<i>Daphoenositta chrysoptera</i>	varied sittella		V	Possible. Some suitable foraging habitat may be available in the remnant areas associated with the southern and northern precinct.	All consolidated areas of remnant vegetation will be retained within both precincts, limiting any impact on the foraging resources of the sittella.
Birds	<i>Calyptorhynchus lathamii</i>	glossy black-cockatoo		V	Possible. Occurs in open woodlands on the coastline and is highly dependent on vegetation where <i>Allocasuarina</i> sp is present, which may occur within the project area.	There are scattered <i>Allocasuarina</i> sp. throughout the north west sector of the northern precinct. No consolidated areas of habitat are proposed for removal as part of the development proposal. Additionally all remnant vegetation is proposed to be protected under an E3 zone.

Class	Scientific name	Common name	EPBC Act status	BC Act status	Likelihood of occurrence	Potential site impacts
Birds	<i>Pandion cristatus</i>	eastern osprey		V	Possible. More likely associated with estuarine areas further to the east and large dam to the east of the southern precinct	The osprey may be an itinerant visitor to the subject site as there are known nesting pairs further to the east along the coast, however, there are no large water bodies associated with the site which would provide suitable foraging habitat. Similarly, there are no large tree stags for nesting.
Birds	<i>Ninox strenua</i>	powerful owl		V	Possible. Inhabits a range of vegetation types including woodland and open sclerophyll forest to tall open wet forest (including fragmented landscapes) which is mapped to occur within the project area.	The powerful owl may utilise the site for foraging but there are no hollow-bearing trees suitable for breeding. All consolidated areas of remnant vegetation on the site are proposed to be protected under environmental zoning.
Mammals	<i>Dasyurus maculatus</i>	spotted-tailed quoll	E	V	Possible. As a wide ranging landscape species the quoll could find suitable foraging habitat in the remnant forest located on the southern and northern precincts.	Negligible, no consolidated areas of remnant vegetation are being removed as part of the proposal, however the species is wide ranging and falls in to the landscape species management stream. Quolls are likely to benefit from movement habitat linkages across the local area.
Mammals	<i>Phascolarctos cinereus</i>	koala	V	V	Possible. There is mapped secondary and tertiary koala habitat mapped across the subject areas and three records from vegetation associated with Poundyard Creek.	There are three BioNet records associated with Poundyard Creek, this land is not part of the development footprint and is likely to continue to act as a movement corridor for koalas. All consolidated remnants of native vegetation, including primary koala food trees, are proposed to be protected on the development site under environmental zoning. The planting of primary koala food trees within the indicative habitat linkages, as part of the proposed VMP, will consolidate habitat resources for the koala.

Class	Scientific name	Common name	EPBC Act status	BC Act status	Likelihood of occurrence	Potential site impacts
Mammals	<i>Pteropus poliocephalus</i>	grey-headed flying-fox	V	V	Likely. Occurs in tall open forest and forages in flowering trees of rainforests, eucalypts, paperbarks and banksias which may be present within the project area	May utilise flowering eucalypts and paperbarks on a seasonal basis, A large flying fox camp located further east may increase the chances that habitat in the area is utilised by the grey headed flying fox. All consolidated areas of remnant vegetation on the site are proposed to be retained under environmental zoning.
Mammals	<i>Kerivoula papuensis</i>	golden-tipped bat		V	Recorded from southern precinct. Occurs in dry eucalypt forest and wet sclerophyll forest which is mapped to occur within the project area.	This bat may utilise the site for foraging but all consolidated areas of remnant vegetation on the site are proposed to be retained under environmental zoning.

Key: BC Act: E1 Endangered, V Vulnerable

EPBC: CE Critically endangered, E Endangered, V Vulnerable,



Figure 3: Threatened species records (Bionet)

Keiley Hunter Urban Planner
Bark Hut Rd EA

Project area (202 DP874273)

Property boundary

Threatened flora species

● Rusty Plum, Plum Boxwood

● Southern Swamp Orchid

Threatened fauna species

▲ Black Bittern

▲ Black-necked Stork

▲ Freckled Duck

▲ Glossy Black-Cockatoo

▲ Golden-tipped Bat

▲ Grey-headed Flying-fox

▲ Koala

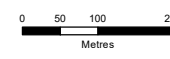
▲ Spotted-tailed Quoll

▲ Varied Sittella

▲ White-bellied Sea-Eagle



Job number: PR2836
Revision: 0
Author: ALM,DJB
Date: 24/11/2017



GDA 1994 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 1994
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3.3 Flora assessment

Appendix 4 lists flora species identified during field surveys. No threatened species were recorded. Ground-truthing of the PCT boundaries was confirmed to be correct and the PCTs matched the NSW BioNet Vegetation Classification, see Figure 2. These vegetation communities are also confirmed against the equivalent LGA fine-scale vegetation mapping (OEH 2012a).

3.3.1 Threatened flora

The desktop assessment identified five threatened flora species within 5 km of the site. A site survey targeting the southern swamp-orchid (*Phaius australis*), listed as endangered under both the EPBC Act and the 2016 BC Act, did not locate this species (Ecosure 2016b).

There is a single rusty plum record along the western boundary of the northern precinct, although this appears to be erroneous as the coordinates place the record in the middle of long since cleared land. Targeted searches did not locate this species in nearby remnant vegetation or anywhere else across the subject site.

Similarly, targeted searches did not detect the other three threatened flora species captured by the 5km BioNet search (slender marsdenia, red boppel nut and rough-shelled bush nut).



Plate 1. Remnant vegetation north west corner



Plate 2. Isolated paddock tree (Brushbox)

3.3.1 Endangered ecological communities

The EPBC Act Protected Matters Search identified three listed TECs as likely to occur within the area. These are:

- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia TEC listed as critically endangered under the EBPC Act. This community is analogous to Littoral Rainforest in the South East Corner, Sydney Basin and NSW North Coast Bioregions which is listed as a TEC under the BC Act.
- Lowland Rainforest of Subtropical Australia TEC listed as critically endangered under the EBPC Act. This community is analogous to Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions which is listed as a TEC under the BC Act.
- Subtropical and Temperate Coastal Saltmarsh TEC listed as vulnerable under the EPBC Act. This community is analogous to Coastal saltmarsh in the NSW North Coast, Sydney Basin and South East Corner bioregions which is listed as a TEC under the BC Act.

Ground truthing did not detect any of the EPBC Act listed TECs.

3.4 Fauna habitat assessment and modified SAT

Appendix 5 lists fauna species identified by timed bird surveys and opportunistic sightings. Forty-seven species of bird and one mammal (Eastern grey kangaroo) were observed. No threatened species were recorded.

Northern precinct

The northern precinct contains a linear drainage basin which terminates at a dam. The dam overflow leads to a culvert and eventually to the Council sports fields. This drainage has created an artificial wetland environment at its southern terminus before the water continues further south passing under a cement culvert.

In terms of fauna habitat the vegetation communities within the site boundaries are generally degraded as a result of either frequent slashing of the understorey or dense weedy undergrowth. Reduced slashing and/or grazing in the last few years has resulted in the regrowth of slash pine (*Pinus elliotti*) and groundsel bush (*Baccharis halimifolia*). There are good patches of remnant vegetation in the northwest and southern central areas although little deadwood remains on the ground.

There is minimal habitat for threatened arboreal wildlife and large forest owls with no significant large diameter hollow-bearing trees across the site. There are some isolated young eucalypt trees located in the lower level of the drainage line on the eastern side. A significant amount of branch decay from regular water inundation has resulted in some trees with small diameter hollows.

The site does provide marginal habitat as part of a larger connected network of linear vegetated strips across the local landscape. Given the site's proximity to urban development and that the majority of the site is cleared, the fauna habitat present is low to medium.

Southern precinct

There are some isolated patches of brushbox (*Lophostemon confertus*) and tallowwood (*Eucalyptus microcorys*) in the southern end of the southern precinct which are less than 80 years old. There are two much larger brushbox that may exceed 150 years old but neither is currently hollow-bearing. Portions of the northern end of this lot are being invaded by wildling slash pine (Plate 3). There are no large diameter hollow-bearing trees associated with this precinct. The remainder of the site is dominated by exotic grasses and perennial weeds perpetuated by regular slashing of the site.



Plate 3. Young slash pine forest associated with the southern precinct

Comprehensive Koala Plan of Management (CKPoM)

The northern precinct contains a centrally located patch of blackbutt (*Eucalyptus pilularis*) of approximately 1 hectare and roughly circular in shape containing trees approximately 50 - 60 years old. This area is mapped as tertiary koala habitat under Council's CKPoM. Blackbutt is considered a secondary koala feed tree species, see Figure 4. There is minimal midstorey and some scattered native species in the understorey. Remnant vegetation associated with the north west corner is also mapped as tertiary koala habitat.

The southern precinct contains secondary koala habitat along the northern boundary which is associated with riparian vegetation along Poundyard Creek. There is no other koala habitat mapping associated with the southern precinct, see Figure 4.

Primary and secondary koala feed trees were surveyed including areas mapped as secondary and tertiary koala habitat under Councils CKPoM (Lunney et al. 1999). No koalas were sighted or distinctive scats found on the site based on the modified SAT assessment of 25 trees within each precinct.

While there are no koala records associated with the subject area, there are three NSW BioNet records located close to Poundyard Creek (Figure 4) where council owned land bisects the two subject precincts. It is reasonable to assume that koalas use this riparian corridor to move across the landscape, but also because there are primary koala food trees, including *Eucalyptus tereticornis* and *Eucalyptus grandis*, located within this area.

The proposed development will not remove any secondary or tertiary koala habitat or remove any of the primary koala food tree species including tallowwood (*Eucalyptus microcorys*), swamp mahogany (*E. robusta*), flooded gum (*E. grandis*), forest red gum (*E. tereticornis*), or small-fruited grey gum (*E. propinqua*).

Retention of all the large remnant areas of native vegetation will ensure the development will not destroy, damage or compromise the values of the land as koala habitat.

The proposal will not result in significant barriers being established to koala movement by ensuring habitat linkages are enhanced through implementation of a VMP to improve the habitat availability for koalas where appropriate. Additionally, boundary fencing will not prevent the free movement of koalas, although it may be necessary to erect exclusion fencing to prevent koalas from entering areas where there is high usage by people, vehicles and dogs.

New local roads will be designed to reduce traffic speed to 40 kph where roads cross identified wildlife corridor areas. It may be necessary to exclude all dogs from areas set aside for wildlife corridor management.

Kangaroo assessment

Eastern grey kangaroo counts across the southern and northern precinct returned numbers of 45 and 120 respectively. Council owned land between the two precincts, and the subject of ongoing construction for the purposes of sporting fields, also retains a large resident population of approximately 145 kangaroos. This large mob is currently taking advantage of

the new growth associated with the fields. Based on diurnal and evening surveys kangaroos are resting in the peripheral shaded areas during the hottest part of the day and browsing on the more open areas during the morning, late afternoon and evening. A number of kangaroo carcasses were located during the survey suggesting wild dogs or dingoes are having some impact on the local population.

Subdivision design will need to incorporate a number of the key objectives of the Coffs Harbour Kangaroo Management Plan to ensure the welfare of both kangaroos and future residents (CHCC 2017).

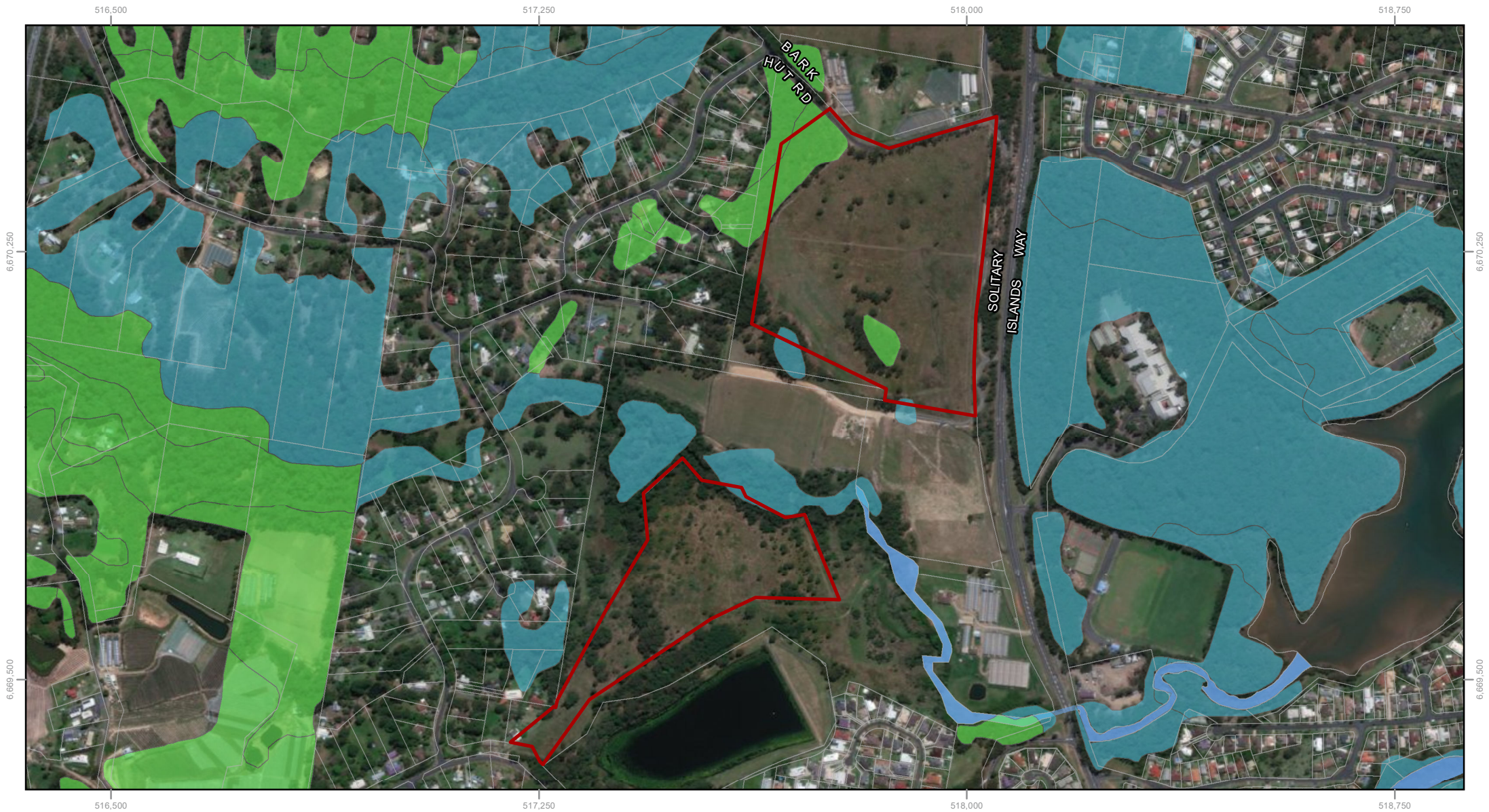


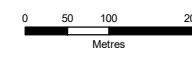
Figure 4: Koala habitat

Keiley Hunter Urban Planner
Bark Hut Rd EA

- Project area (202 DP874273)
- Property boundary
- Tertiary koala habitat
- Secondary koala habitat



Job number: PR2836
Revision: 0
Author: DJB
Date: 10/11/2017



GDA 1994 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 1994
Units: Meter

3.5 Bushfire threat analysis

It is anticipated that an Asset Protection Zone (APZ) will be required where proposed dwellings adjoin areas of consolidated dry sclerophyll forest, particularly along the western boundary of the northern precinct. Holiday Coast Bushfire Solutions will determine the requisite distances based on the plant community type, structure and slope and target Bushfire Attack Level (BAL).

APZs will generally be excluded from extending in to remnant native vegetation. However, there may be circumstances where the Outer Protection Area (OPA) of an APZ will impinge in to proposed E3 zones.

3.6 Woolgoolga Lake Estuary Coastal Zone Management Plan

The Coastal Zone Management Plan (CZMP) recognises that new developments have the potential to reduce the quality of catchment runoff during and after the construction phase. It is important that controls are placed on this new development to ensure no negative net impact upon water quality. This includes stormwater management (treatment and detention) of a standard that will not impact on Poundyard Creek or the Woolgoolga Lake Estuary. Stormwater management and pollutant inputs from the catchment was the second highest ranked issue identified in the CZMP.

Water quality also has the potential to impact on a range of terrestrial and aquatic threatened fauna including some of the threatened entities identified in Table 3.

4 Discussion

Figure 5 identifies areas of ecological value that are proposed to be retained as E3 – Environmental Management. Indicative wildlife linkages are also shown to demonstrate the major pathways for wildlife through the landscape.

Northern precinct

The most important ecological attributes of the northern precinct are associated with the remnant native vegetation in the northwest corner which provides an important habitat linkage with adjoining vegetation. This narrow strip of vegetation connects to Poundyard Creek which is an important mapped 'urban link' corridor (CHCC 2015).

The desktop review identified five threatened flora species that have been recorded within 5 km of the site. No threatened flora species were observed during the site assessment.

The desktop review identified 19 terrestrial fauna species that have been recorded within 5 km of the site. The likelihood of occurrence table (refer to Table 3) identified numerous bird, bat and frog species that could potentially utilise the site, particularly the vegetated areas. It is possible frogs could utilise the dam, gullies and other areas of low elevation at the southern end of the northern precinct.

No threatened fauna species were observed on-site. The Rainbow bee-eater was observed offsite to the northeast of the survey area. This bird is listed as a migratory species under the EPBC Act. Further assessment should be undertaken to consider the potential impacts on this species.

APZs will be proposed along the northwestern, northern, western and southwestern boundaries and the patch of blackbutt forest located more centrally in the northern precinct. The APZ requirement is expected to be approximately 21 m in width for all of these areas. The fire assessment report will make recommendations on the APZ requirements for the northern boundary of the southern precinct which contains wet sclerophyll forest on gently sloping land.

The pond and stormwater treatment areas and other low lying areas should be planted with sedges and wetland plants to improve their ecological value. It is intended that there will be no net increase of pollutants from the site. The design of the pond and treatment systems will be outlined in a final Stormwater Management Plan as part of a Development Application to Council.

There are opportunities to establish E3 – Environmental Management zone across the northern precinct, which will protect and link vegetation across the local landscape and provide suitable movement corridors for wildlife. These areas are confined to the western and southern boundaries of the lot, particularly the northwest sector.

Southern precinct

The natural values of the southern precinct include scattered brushbox, turpentine and a few large diameter tallowwoods. There are no large diameter hollow-bearing trees associated with the site. There are some fringes of wet sclerophyll forest mapped as secondary koala habitat along the northern boundary that link with riparian vegetation associated with Poundyard Creek. Some infill planting of this area would further consolidate this vegetation and enhance ecological buffering of Poundyard Creek.

A large council owned water storage south-east of the southern precinct has a number of NSW BioNet threatened species records of wetland fauna.

The rest of the site is dominated by exotic grassland and invasive shrubs and trees including large areas of establishing wildling slash pine. There are opportunities to retain individual eucalypts and a larger patch of remnant vegetation (approximately 500 m²) of eucalypts located across the central portion of the site. This patch of remnant vegetation could become a more passive community based area for the benefit of the local residents.

The thin area of mapped secondary koala habitat along the northern boundary will be retained and enhanced to better consolidate riparian vegetation associated with Poundyard Creek. Protection of this area of council land is important given there are two koala records in the NSW BioNet. This riparian area is likely to act as a movement corridor for koalas across the landscape.

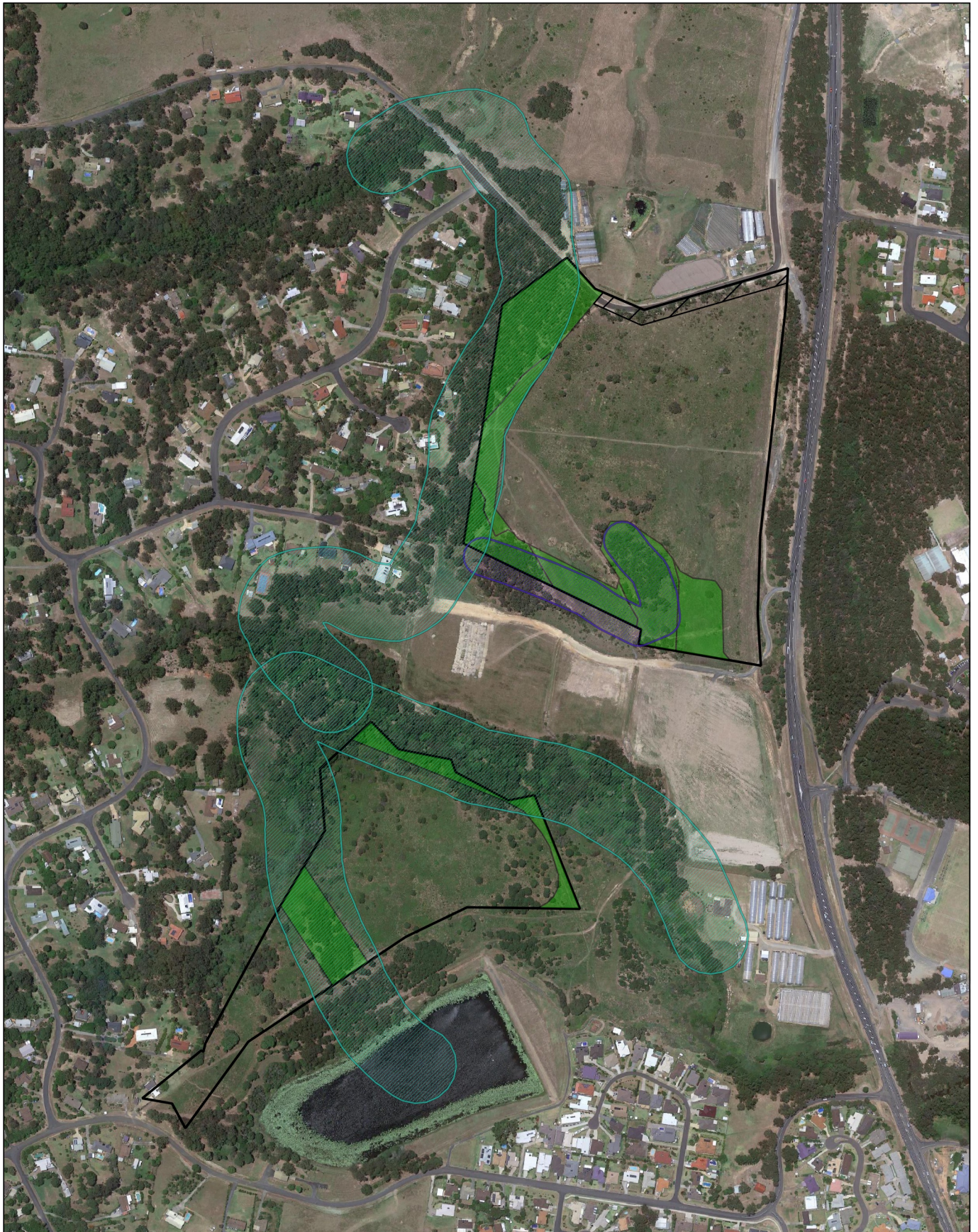







Figure 5: Proposed environmental zoning and indicative biolinks

Keiley Hunter Urban Planner
Bark Hut Rd EA

Note – there may be spatial misalignment between lot boundaries and underlying imagery


-  Site boundary (Lot 202 DP874273)
-  50 m biolink
-  25 m biolink
-  Proposed E3 Environmental management
-  Zone 1b buffer



Job number: PR3278
Revision: 0
Author: JLY
Date: 15/08/2018



0 50 100 150 200 m



GDA 1994 MGA Zone 56
Projection: Transverse Mercator
Datum: GDA 1994
Units: Meter

5 Recommendations

The following actions are recommended for the future development of the site:

1. Retain as much remnant native vegetation on-site as possible, including all mapped koala habitat and ensure that proposed APZs do not impinge on these areas where possible (see Figure 5).
2. Conduct additional flora and fauna surveys to account for seasonal variations (and investigate presence of frogs), targeting species that have been determined to possibly occur on the site (Table 3).
3. Consider the development proposal's impact on eastern grey kangaroos, particularly within the context of the Council sports fields being developed between the two development precincts which will increase the availability of food resources.
4. Where possible, link remnant vegetation of the site to other extant vegetation across the landscape to provide suitable movement pathways for wildlife. For the subject area this should include a network of E3 zoned areas in appropriate locations (Figure 5).
5. Retain individual eucalypts and a larger patch of remnant vegetation (approximately 500m²) of eucalypts located across the central portion of the southern precinct either as remnant bushland or a more passive community based area for the benefit of the local residents.
6. Prepare a Comprehensive Vegetation Management Plan (VMP) in accordance with CHCC's requirements to increase habitat value. The comprehensive VMP should give specific consideration to:
 - wetland species for the proposed bio-retention basin and other low lying areas
 - enhancement of proposed E3 zoned areas under CHCC's LEP
 - linking areas of remnant vegetation by identifying habitat linkages and 'gap filling' as required (including the northern boundary of the southern precinct).
7. Conduct a detailed impact assessment that shows the extent of vegetation that will be removed / retained when the final concept design is developed.
8. Given the proximity of the proposed development to Woolgoolga Lake and the Solitary Islands Marine Park, effective sediment and erosion controls should be employed during any future construction works. A management plan is recommended to prevent, mitigate and ameliorate the impacts of sediment runoff.
9. Implement the key objectives of the Coffs Harbour Kangaroo Management Plan to establish a strategic approach to maintain wild populations of eastern grey kangaroo while managing the social, economic and ecological impacts and ensuring their welfare.

-
10. Implement a Storm Water Management Plan (including artificial wetlands) to reduce nutrients and sediments from reaching the surrounding areas. This is also recommended in the Woolgoolga Lake Estuary Coastal Zone Management Plan.
 11. Limit the impact of APZs on remnant vegetation ensuring only Outer Protection Areas (OPA) impinge in to the proposed E3 zoned areas
 12. Utilise local native landscaping for future developments (including any revegetation works), sourcing seed where possible from surrounding vegetation.

6 Conclusion

The two precincts associated with the development have a long history of agricultural use including extensive grazing. More recently these areas have been maintained as grassland, predominately exotic, by slashing. The southern precinct, if left undisturbed, would eventually revert to a mature slash pine forest as there are many wildings dominating the site.

No large diameter hollow-bearing trees were located during the field assessment, suggesting that the site has been successively logged over the last 150 years. The majority of remnant vegetation is young eucalypt forest dominated by blackbutt and interspersed with other eucalypt species. This has limited the habitat value of the vegetation for a range of arboreal wildlife such as microbats, gliders, quolls, phascogales and large forest owls.

The current field assessment did not detect any threatened flora or fauna species on the site at the time of the survey. The individual threatened flora records from the northern precinct remain incongruous as none of the threatened plants previously identified at the site were located. The author is unsure whether the spatial records are inaccurate or whether the individual plants have been collected (i.e. Southern swamp orchid), or perished as a result of grazing, slashing, clearing, fungal attack or drought.

The NSW Bionet records indicate that the site, and its surrounds, are utilised by a range of threatened fauna species on a seasonal basis. Further seasonal surveys for some fauna species are required.

The re-zoning proposal will need to give consideration to the very large population of eastern grey kangaroos currently inhabiting the subject area and surrounds (including the proposed council sports fields). Based on estimates, the population currently numbers approximately 300 individuals which will be severely compromised by a large lot subdivision and formal sports fields.

This report recommends a network of biolinks to connect linear remnants of vegetation across the fringes of the two precincts, using riparian vegetation along Poundyard Creek as a focal point (Figure 5). The proposed re-zoning of the best consolidated patches of remnant vegetation under E3 – Environmental Management is important to consolidate the long term protection of habitat. This is one of the objectives under CHCC's Development Control Plan 2015 (E1.2 compensatory requirements) 'to protect and maintain important linkages between habitats'.

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Office of Environment & Heritage, *Threatened species profile search*. Accessed 14 Oct 2016 <http://www.environment.nsw.gov.au/threatenedSpeciesApp/>

Appendix 1 Preliminary concept design

Appendix 2 BioNet search

Class name	Family name	Scientific name	Common name	NSW Status	Comm Status
Amphibia	Myobatrachidae	<i>Mixophyes iteratus</i>	Giant Barred Frog	E1,2	E
Aves	Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E1	not listed
	Psittacidae	<i>Lathamus discolor</i>	Swift Parrot	E1,P,3	CE
	Ardeidae	<i>Ardea ibis</i>	Cattle Egret	not listed	C,J
	Apodidae	<i>Hirundapus caudacutus</i>	White-throated Needletail	not listed	C,J,K
	Anatidae	<i>Stictonetta naevosa</i>	Freckled Duck	V	not listed
	Columbidae	<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V	not listed
	Ardeidae	<i>Ixobrychus flavicollis</i>	Black Bittern	V	not listed
	Gruidae	<i>Grus rubicunda</i>	Brolga	V	not listed
	Jacanidae	<i>Irediparra gallinacea</i>	Comb-crested Jacana	V	not listed
	Neosittidae	<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	not listed
	Accipitridae	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	C
	Cacatuidae	<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V,2	not listed
	Accipitridae	<i>Pandion cristatus</i>	Eastern Osprey	V,3	not listed
	Strigidae	<i>Ninox strenua</i>	Powerful Owl	V,3	not listed
Mammalia	Dasyuridae	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E
	Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	V	V
	Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V
	Vespertilionidae	<i>Kerivoula papuensis</i>	Golden-tipped Bat	V	not listed
Flora	Apocynaceae	<i>Marsdenia longiloba</i>	Slender Marsdenia	E1	V
	Orchidaceae	<i>Phaius australis</i>	Southern Swamp Orchid	E1,2	E
	Sapotaceae	<i>Niemeyera whitei</i>	Rusty Plum, Plum Boxwood	V	not listed
	Proteaceae	<i>Hicksbeachia pinnatifolia</i>	Red Boppel Nut	V	V
	Proteaceae	<i>Macadamia tetraphylla</i>	Rough-shelled Bush Nut	V	V

TSA: E1 Endangered, P Protected, V Vulnerable, 2 Category 2 sensitive species, 3 Category 3 sensitive species

EPBC: CE Critically endangered, E Endangered, V Vulnerable

Appendix 3 EPBC protected matters search results



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 22/09/17 10:51:00

[Summary](#)

[Details](#)

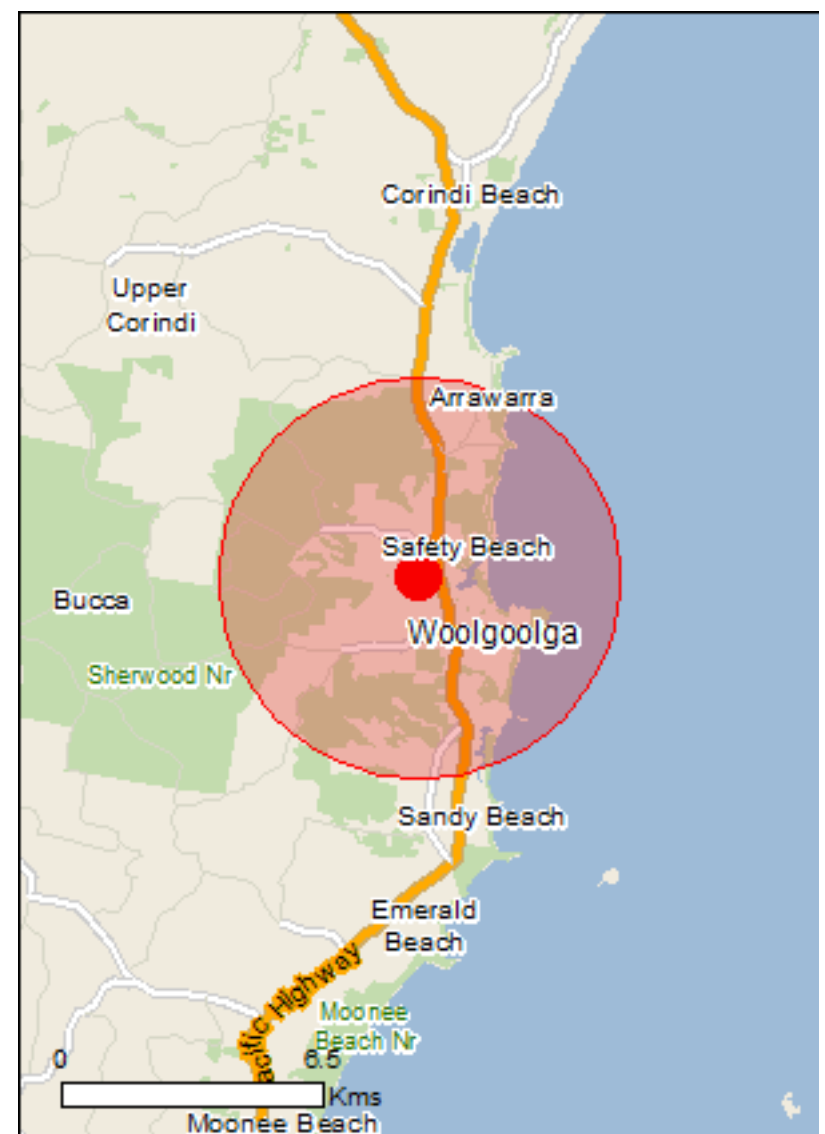
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

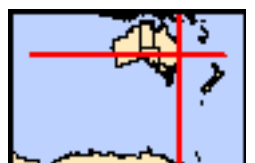
[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 5.0Km



Summary

Matters of National Environmental Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	73
Listed Migratory Species:	51

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	89
Whales and Other Cetaceans:	12
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	5
Regional Forest Agreements:	1
Invasive Species:	41
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities

[\[Resource Information \]](#)

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

Name	Status	Type of Presence
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area

Listed Threatened Species

[\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely

Name	Status	Type of Presence
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	to occur within area Species or species habitat likely to occur within area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Limosa lapponica baueri Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area
Limosa lapponica menzbieri Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri) [86432]	Critically Endangered	Species or species habitat may occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area
Fish		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat likely to occur within area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat known to occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area

Name	Status	Type of Presence
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus		
Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae		
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus		
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area
Plants		
Allocasuarina defungens		
Dwarf Heath Casuarina [21924]	Endangered	Species or species habitat known to occur within area
Allocasuarina thalassoscopica		
[21927]	Endangered	Species or species habitat known to occur within area
Arthraxon hispidus		
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Boronia umbellata		
Orara Boronia [56301]	Vulnerable	Species or species habitat likely to occur within area
Cryptostylis hunteriana		
Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area
Cynanchum elegans		
White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Hicksbeachia pinnatifolia		
Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat known to occur within area
Macadamia integrifolia		
Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area
Macadamia tetraphylla		
Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area
Marsdenia longiloba		
Clear Milkvine [2794]	Vulnerable	Species or species habitat likely to occur within area
Parsonsia dorrigoensis		
Milky Silkpod [64684]	Endangered	Species or species habitat likely to occur within area
Phaius australis		
Lesser Swamp-orchid [5872]	Endangered	Species or species habitat known to occur within area
Samadera sp. Moonee Creek (J.King s.n. Nov. 1949)		
[86885]	Endangered	Species or species habitat likely to occur within area
Thesium australe		
Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Tylophora woollsii [20503]	Endangered	Species or species habitat likely to occur within area
Zieria prostrata Headland Zieria [56782]	Endangered	Species or species habitat known to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Sharks		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat likely to occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardenna carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Sternula albifrons Little Tern [82849]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Migratory Marine Species		
Balaena glacialis australis Southern Right Whale [75529]	Endangered*	Species or species habitat likely to occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Manta alfredi Reef Manta Ray, Coastal Manta Ray, Inshore		Species or species

Name	Threatened	Type of Presence
Manta Ray, Prince Alfred's Ray, Resident Manta Ray [84994] Manta birostris		habitat known to occur within area
Giant Manta Ray, Chevron Manta Ray, Pacific Manta Ray, Pelagic Manta Ray, Oceanic Manta Ray [84995] Megaptera novaeangliae		Species or species habitat may occur within area
Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Foraging, feeding or related behaviour may

Name	Threatened	Type of Presence
Gallinago megala Swinhoe's Snipe [864]		occur within area Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

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

Name
Commonwealth Land - Australian Telecommunications Commission

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat known to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species

Name	Threatened	Type of Presence
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	habitat known to occur within area Species or species habitat likely to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Cuculus saturatus Oriental Cuckoo, Himalayan Cuckoo [710]		Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Foraging, feeding or related behaviour may occur within area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur

Name	Threatened	Type of Presence within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Breeding known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Phoebastria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Foraging, feeding or related behaviour likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta Tasmanian Shy Albatross [89224]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species

Name	Threatened	Type of Presence
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	habitat may occur within area Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche sp. nov. Pacific Albatross [66511]	Vulnerable*	Species or species habitat may occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat may occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Campichthys tryoni Tryon's Pipefish [66193]		Species or species habitat may occur within area
Corythoichthys amplexus Fijian Banded Pipefish, Brown-banded Pipefish [66199]		Species or species habitat may occur within area
Corythoichthys ocellatus Orange-spotted Pipefish, Ocellated Pipefish [66203]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Halicampus grayi Mud Pipefish, Gray's Pipefish [66221]		Species or species habitat may occur within area
Hippichthys cyanospilos Blue-speckled Pipefish, Blue-spotted Pipefish [66228]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus kelloggi Kellogg's Seahorse, Great Seahorse [66723]		Species or species habitat may occur within area
Hippocampus kuda Spotted Seahorse, Yellow Seahorse [66237]		Species or species

Name	Threatened	Type of Presence
Hippocampus planifrons Flat-face Seahorse [66238]		habitat may occur within area Species or species habitat may occur within area
Hippocampus trimaculatus Three-spot Seahorse, Low-crowned Seahorse, Flat-faced Seahorse [66720]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Micrognathus andersonii Anderson's Pipefish, Shortnose Pipefish [66253]		Species or species habitat may occur within area
Micrognathus brevirostris thorntail Pipefish, Thorn-tailed Pipefish [66254]		Species or species habitat may occur within area
Microphis manadensis Manado Pipefish, Manado River Pipefish [66258]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Solegnathus hardwickii Pallid Pipehorse, Hardwick's Pipehorse [66272]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within

Name	Threatened	Type of Presence area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area
Mammals		
Dugong dugon Dugong [28]		Species or species habitat may occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Breeding likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area
Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Delphinus delphis Common Dophin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area

Name	Status	Type of Presence
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Coffs Coast	NSW
Forestry Management Areas in Coffs Harbour	NSW
Garby	NSW
Sherwood	NSW
UNE Special Management Zone No1	NSW

Regional Forest Agreements	[Resource Information]
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Note that all areas with completed RFAs have been included.

Name	State
North East NSW RFA	New South Wales

Invasive Species	[Resource Information]
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Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine,		Species or species

Name	Status	Type of Presence
Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643] <i>Asparagus aethiopicus</i>		habitat likely to occur within area
Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425] <i>Asparagus plumosus</i>		Species or species habitat likely to occur within area
Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
<i>Cabomba caroliniana</i> Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] <i>Chrysanthemoides monilifera</i>		Species or species habitat likely to occur within area
Bitou Bush, Boneseed [18983]		Species or species habitat likely to occur within area
<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush [16332]		Species or species habitat likely to occur within area
<i>Eichhornia crassipes</i> Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
<i>Genista</i> sp. X <i>Genista monspessulana</i> Broom [67538]		Species or species habitat may occur within area
<i>Lantana camara</i> Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] <i>Pinus radiata</i>		Species or species habitat likely to occur within area
Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
<i>Protasparagus densiflorus</i> Asparagus Fern, Plume Asparagus [5015]		Species or species habitat likely to occur within area
<i>Protasparagus plumosus</i> Climbing Asparagus-fern, Ferny Asparagus [11747]		Species or species habitat likely to occur within area
<i>Rubus fruticosus</i> aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
<i>Sagittaria platyphylla</i> Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
<i>Salix</i> spp. except <i>S.babylonica</i> , <i>S.x calodendron</i> & <i>S.x reichardtii</i> Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
<i>Salvinia molesta</i> Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
<i>Senecio madagascariensis</i> Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
<i>Hemidactylus frenatus</i> Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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

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

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

Coordinates

-30.1027 153.18391

Acknowledgements

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

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
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- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

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

Please feel free to provide feedback via the [Contact Us](#) page.

Appendix 4 Flora survey results

Family name	Scientific name	Common name	Exotic	North east	North west	Wetland	South block
Apiaceae	<i>Hydrocotyle bonariensis</i>	Largeleaf Pennywork	*		*		
Apocynaceae	<i>Araujia sericifera</i>	Moth vine	*	*			
Apocynaceae	<i>Asclepias curassavica</i>	Milkweed	*	*			
Apocynaceae	<i>Gomphocarpus physocarpus</i>	Balloon Cotton Bush	*		*		*
Apocynaceae	<i>Parsonsia straminea</i>	Common Silkpod		*			
Araliaceae	<i>Polyscias sambucifolia</i>	Elderberry Panax		*			
Araliaceae	<i>Schefflera actinophylla</i>	Umbrella tree	*	*	*		
Asparagaceae	<i>Asparagus aethiopicus</i>	Asparagus Fern	*		*		*
Asteraceae	<i>Ageratum conyzoides</i>	Blue billygoat weed	*	*			*
Asteraceae	<i>Ageratum houstonianum</i>	Whiskey grass	*		*		
Asteraceae	<i>Baccharis halimifolia</i>	Groundsel Bush	*	*	*		*
Asteraceae	<i>Bidens pilosa</i>	Cobbler's Pegs	*	*	*		*
Asteraceae	<i>Chrysanthemoides monilifera</i> spp. <i>Rotunda</i>	Bitou bush	*	*			
Asteraceae	<i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i>	Bitou Bush	*		*		
Asteraceae	<i>Cirsium vulgare</i>	Spear Thistle	*		*		*
Asteraceae	<i>Ozothamnus diosmifolius</i>	White Dogwood			*		
Asteraceae	<i>Senecio madagascariensis</i>	Fireweed	*	*	*		
Asteraceae	<i>Tagetes minuta</i>	Stinking roger	*				*
Blechnaceae	<i>Blechnum cartilagineum</i>	Gristle Fern			*		
Casuarinaceae	<i>Allocasuarina torulosa</i>	Forest Oak		*			
Convolvulaceae	<i>Convolvulus erubescens</i>	Australian Bindweed			*	*	
Convolvulaceae	<i>Ipomoea cairica</i>	Mile-a-minute	*		*		*
Cupressaceae	<i>Callitris rhomboidea</i>	Port Jackson Pine			*		
Curcubitaceae	<i>Cucumis zeyheri</i>	South African spiny cucumber	*	*			

Family name	Scientific name	Common name	Exotic	North east	North west	Wetland	South block
Cyatheaceae	<i>Cyathea australis</i>	Rough Treefern					*
Cyperaceae	<i>Baumea juncea</i>	Bare twigrush				*	
Cyperaceae	<i>Baumea teretifolia</i>	Common twig rush				*	
Dennstaedtiaceae	<i>Pteridium esculentum</i>	Bracken			*		*
Dilleniaceae	<i>Hibbertia scandens</i>	Climbing Guinea Flower			*		*
Ericaceae	<i>Leucopogon pimeleoides</i>	Beard heath		*	*		
Ericaceae	<i>Trochocarpa laurina</i>	Tree Heath			*		
Escalloniaceae	<i>Cuttsia viburnea</i>	Elderberry			*		
Fabaceae	<i>Chorizema parviflorum</i>	Eastern Flame Pea		*			
Fabaceae	<i>Daviesia ulicifolia</i>	Gorse Bitter Pea			*		
Fabaceae	<i>Jacksonia scoparia</i>	Dogwood			*		
Fabaceae	<i>Kennedia rubicunda</i>	Dusky Coral-pea					*
Fabaceae (Caesalpinioideae)	<i>Senna pendula</i> var. <i>glabrata</i>	Winter Senna	*	*			*
Fabaceae (Faboideae)	<i>Pultenaea retusa</i>	Notchedbush pea		*			
Fabaceae (Mimosoideae)	<i>Acacia irrorata</i>	Green Wattle					*
Fabaceae (Mimosoideae)	<i>Acacia melanoxylon</i>	Blackwood			*		*
Goodeniaceae	<i>Goodenia rotundifolia</i>	Round-leaved Goodenia		*			
Juncaceae	<i>Juncus usitatus</i>	Common rush				*	
Lauraceae	<i>Cinnamomum camphora</i>	Camphor Laurel	*	*	*		*
Lindsaeaceae	<i>Lindsaea microphylla</i>	Wedge fern			*		
Lomandraceae	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush			*		*
Luzuriagaceae	<i>Eustrephus latifolius</i>	Wombat Berry			*		*
Luzuriagaceae	<i>Geitonoplesium cymosum</i>	Scrambling Lily			*		
Malvaceae	<i>Sida rhombifolia</i>	Paddy's Lucerne	*		*		
Menispermaceae	<i>Stephania japonica</i> var. <i>discolor</i>	Snake Vine			*		*

Family name	Scientific name	Common name	Exotic	North east	North west	Wetland	South block
Moraceae	<i>Ficus watkinsiana</i>	Strangling Fig					*
Myrtaceae	<i>Corymbia intermedia</i>	Pink Bloodwood					*
Myrtaceae	<i>Eucalyptus eugonoides</i>	Thin-leaved stringbark			*		
Myrtaceae	<i>Eucalyptus microcorys</i>	Tallowwood			*		*
Myrtaceae	<i>Eucalyptus pilularis</i>	Blackbutt			*		
Myrtaceae	<i>Eucalyptus propinqua</i>	Small-fruited Grey Gum			*		
Myrtaceae	<i>Eucalyptus siderophloia</i>	Grey Ironbark			*		*
Myrtaceae	<i>Eucalyptus tereticornis</i>	Forest Red Gum					*
Myrtaceae	<i>Lophostemon confertus</i>	Brush Box			*		*
Myrtaceae	<i>Lophostemon suaveolens</i>	Swamp Mahogany, Swamp Turpentine			*		
Myrtaceae	<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark			*		
Myrtaceae	<i>Syncarpia glomulifera</i>	Turpentine					*
Ochnaceae	<i>Ochna serrulata</i>	Mickey Mouse Plant	*		*		
Oleaceae	<i>Notelaea longifolia</i>	Large Mock-olive					*
Oleaceae	<i>Notelaea venosa</i>	Veined Mock-olive		*			
Orchidaceae	<i>Dipodium punctatum</i>	Blotched Hyacinth Orchid		*			
Orchidaceae	<i>Spiranthes sinensis</i>	Chinese sinensis		*			
Passifloraceae	<i>Passiflora spp.</i>		*		*		
Passifloraceae	<i>Passiflora suberosa</i>	Cork Passionfruit	*		*		*
Passifloraceae	<i>Passiflora subpeltata</i>	White Passionflower	*		*		*
Philydraceae	<i>Philydrum lanuginosum</i>	Woolly Frogmouth				*	
Phormiaceae	<i>Dianella caerulea</i>	Blue Flax-lily			*		
Phyllanthaceae	<i>Breynia oblongifolia</i>	Coffee Bush			*		*
Phyllanthaceae	<i>Glochidion ferdinandi</i>	Cheese Tree			*		*
Pinaceae	<i>Pinus elliotii</i>	Slash pine	*	*	*		*
Pittosporaceae	<i>Billardiera scandens</i>	Hairy Apple Berry		*			
Pittosporaceae	<i>Pittosporum undulatum</i>	Sweet Pittosporum			*		*

Family name	Scientific name	Common name	Exotic	North east	North west	Wetland	South block
Poaceae	<i>Andropogon virginicus</i>	Whisky Grass	*	*			
Poaceae	<i>Axonopus fissifolius</i>	Narrow-leafed Carpet Grass	*		*		
Poaceae	<i>Chloris gayana</i>	Rhodes Grass	*		*		
Poaceae	<i>Cymbopogon refractus</i>	Barbed wire grass			*		
Poaceae	<i>Echinopogon caespitosus</i>	Bushy Hedgehog-grass			*		
Poaceae	<i>Imperata cylindrica</i>	Blady Grass			*		*
Poaceae	<i>Oplismenus aemulus</i>	Basket grass		*			*
Poaceae	<i>Paspalum mandiocanum</i>	Broadleaf Paspalum	*		*		*
Poaceae	<i>Paspalum urvillei</i>	Vasey Grass	*		*		
Poaceae	<i>Pennisetum clandestinum</i>	Kikuyu Grass	*		*		
Poaceae	<i>Setaria sphacelata</i>	South African Pigeon Grass	*		*		*
Poaceae	<i>Themeda triandra</i>	Kangaroo grass			*		*
Polygonaceae	<i>Persicaria spp.</i>	Knotweed	*		*		
Proteaceae	<i>Grevillea robusta</i>	Silky Oak	*	*			
Proteaceae	<i>Persoonia stradbrogensis</i>	Geebung			*		
Rubiaceae	<i>Psychotria loniceroides</i>	Hairy Psychotria					*
Rutaceae	<i>Citrus limon</i>	Bush lemon	*				*
Sapindaceae	<i>Cupaniopsis anacardioides</i>	Tuckeroo					*
Sapindaceae	<i>Jagera pseudorhus var. pseudorhus</i>	Foambark Tree					*
Scrophulariaceae	<i>Digitalis purpurea</i>	Foxglove	*		*		
Solanaceae	<i>Solanum mauritianum</i>	Wild Tobacco Bush	*	*	*		*
Stackhousiaceae	<i>Stackhousia viminea</i>	Slender stachousia		*			
Thymelaeaceae	<i>Pimelia latifolia subsp. altior</i>	Broad-leaved Riceflower		*			
Verbenaceae	<i>Lantana camara</i>	Lantana	*	*	*		*
Verbenaceae	<i>Verbena bonariensis</i>	Purpletop	*	*	*		*
Vitaceae	<i>Cissus antarctica</i>	Water Vine			*		

Family name	Scientific name	Common name	Exotic	North east	North west	Wetland	South block
Vitaceae	<i>Cissus hypoglauca</i>	Giant Water Vine			*		

Appendix 5 Fauna survey results

Class name	Scientific name	Common name	Exotic	North west corner	Wetland	Southern site
Amphibia	<i>Litoria fallax</i>	Eastern Dwarf Tree Frog		*		
Aves	<i>Accipiter novaehollandiae</i>	Grey Goshawk				*
	<i>Acrocephalus australis</i>	Australian Reed Warbler		*		*
	<i>Calyptorhynchus funereus</i>	Yellow-tailed Black-Cockatoo				*
	<i>Coracina tenuirostris</i>	Cicadabird		*		*
	<i>Corvus tasmanicus</i>	Forest Raven				*
	<i>Dacelo novaeguineae</i>	Laughing Kookaburra				*
	<i>Eopsaltria australis</i>	Eastern Yellow Robin				*
	<i>Eudynamys orientalis</i>	Eastern Koel				*
	<i>Eurystomus orientalis</i>	Dollarbird		*		*
	<i>Haliastur sphenurus</i>	Whistling Kite				*
	<i>Hirundo neoxena</i>	Welcome Swallow				*
	<i>Lopholaimus antarctica</i>	Topknot pigeon		*		
	<i>Malurus cyaneus</i>	Superb Fairy-wren		*		*
	<i>Malurus melanocephalus</i>	Red-backed Fairy-wren		*		
	<i>Manorina melanocephala</i>	Noisy Miner		*		
	<i>Meliphaga lewinii</i>	Lewin's Honeyeater		*		*
	<i>Merops ornatus</i>	Rainbow Bee-eater				*
	<i>Neochmia temporalis</i>	Red-browed Finch		*		*
	<i>Philemon citreogularis</i>	Little Friarbird				*
	<i>Psophodes olivaceus</i>	Eastern Whipbird				*
	<i>Rhipidura albiscapa</i>	Grey Fantail				*
	<i>Strepera graculina</i>	Pied Currawong				*
	<i>Todiramphus sanctus</i>	Sacred Kingfisher		*		*
	<i>Trichoglossus haematodus</i>	Rainbow Lorikeet		*		
	<i>Zosterops lateralis</i>	Silvereye		*		

Class name	Scientific name	Common name	Exotic	North west corner	Wetland	Southern site
Mammalia	<i>Canis lupus</i>	Dingo, domestic dog	x	*		
	<i>Macropus giganteus</i>	Eastern Grey Kangaroo		*	*	*
	<i>Macropus rufogriseus</i>	Red-necked Wallaby				*

Revision History

Revision No.	Revision date	Details	Prepared by	Reviewed by	Approved by
00	28/11/2017	Bark Hut Road Ecological Assessment – Draft Report	Nigel Cotsell Senior Ecologist	C. Lokkers Senior Environmental Scientist	Diane Lanyon General Manager
Final	16/08/2018	Bark Hut Road Ecological Assessment – Final report	Nigel Cotsell Senior Ecologist	Trudy Thompson Senior Environmental Scientist	Diane Lanyon General Manager

Distribution List

Copy #	Date	Type	Issued to	Name
1	17/08/2018	Electronic	Keiley Hunter Urban Planner	Keiley Hunter
2	17/08/2018	Electronic	Ecosure	Administration

Citation: Ecosure (2018), Bark Hut Road Ecological Assessment, Final Report to Keiley Hunter Urban Planner, Publication Location – Coffs Harbour

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