

Forest Wind Bird and Bat Utilisation Survey

*Report: FWH-01
Client: Forest Wind Holdings
March 2020*



FOX & CO
ENVIRONMENTAL

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DOCUMENT AUTHORISATION					
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b		8 February 2020		Final report	
c		10 March 2020		Final report	
Prepared By		Reviewed By		Authorised By	
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1 INTRODUCTION

Forest Wind Holdings Pty Limited proposes to develop and construct a wind farm called Forest Wind (the Project) located within operational and actively managed exotic pine plantations in Queensland Government owned Toolara, Tuan and Neerdie State Forests, situated between Gympie and Maryborough in the Wide Bay Region of Queensland.

Specifically, the Project comprises a wind farm with up to 226 wind turbines and ancillary infrastructure (herein referred to as the Project Area – Plantation Licence Area (Project Area (PLA)) The Project Area (PLA) will be located within the Gympie Regional Council (GRC) and Fraser Coast Regional Council (FCRC) Local Government Areas (LGAs).

Bird and bat surveys have been undertaken at the Project Area (PLA) (in addition to other ecological assessments). This report presents the results of the bird and bat utilisation surveys undertaken across the Project Area (PLA).

The ecological assessment, including bird and bat assessment, was conducted over several stages, including desktop assessment, preliminary field assessments and targeted field assessments.

This report has been developed in consideration of the following:

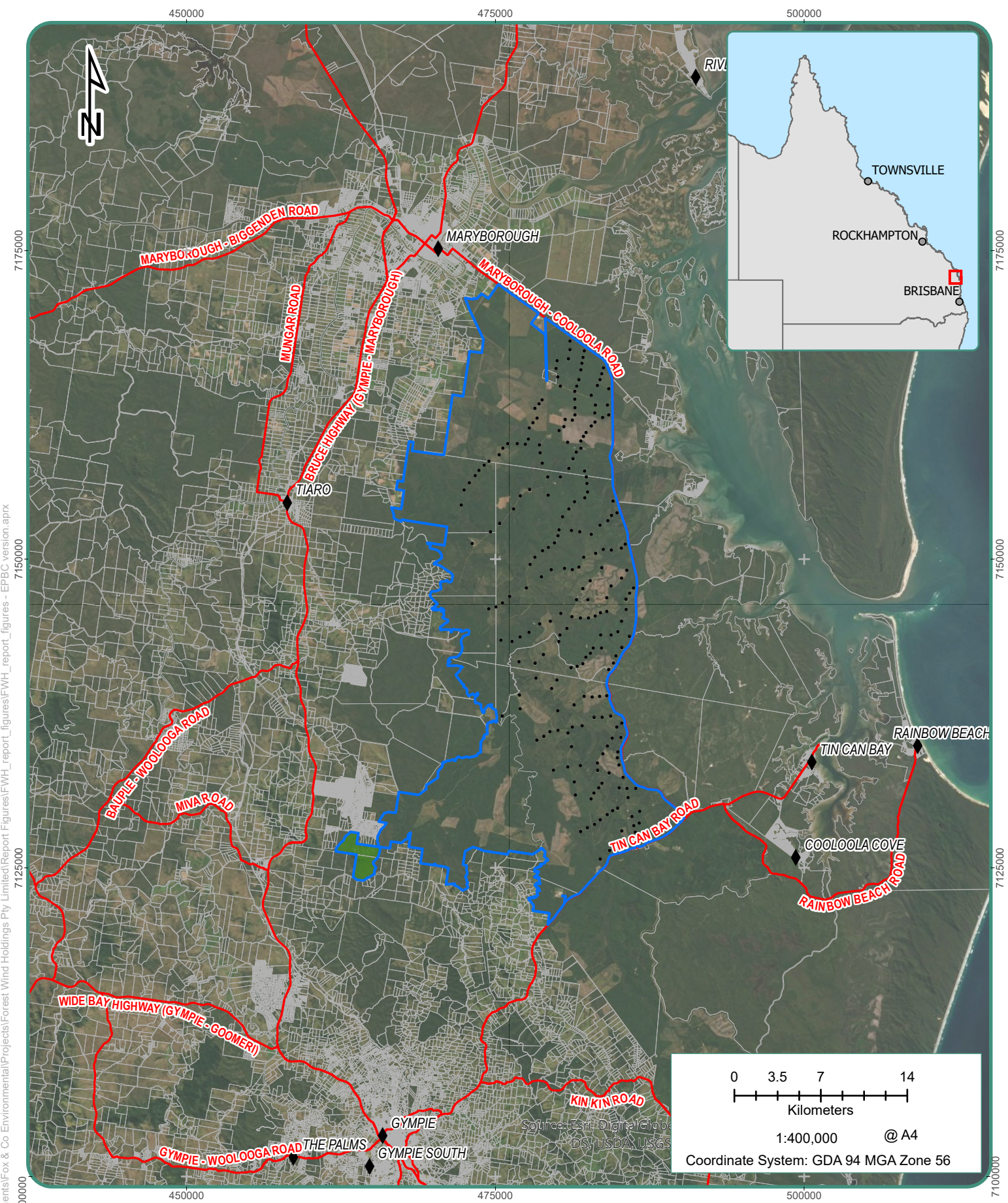
- State Code 23: Wind Farm Development, Planning Guidelines (Queensland Government, June 2018)
- Wind farms and birds: Interim Standards for Risk Assessment. Report No. 2003.35 (2.2) (AusWEA, 2005)
- Draft Significant Impact Guidelines for 36 Migratory Shorebird Species, Migratory Species, EPBC Act Policy Statement 3.21. (DEWHA, 2009)
- Draft Referral Guideline for 14 birds listed as Migratory species under the EPBC Act. (DoE, 2015)
- Referral Guideline for Management Actions in Grey-headed and Spectacled Flying-fox Camps, EPBC Act Policy Statement (DoE, 2015)
- Ecological Assessment, Forest Wind. Report No. 1791513b Premise (2017).

1.1 Location

The Project Area (PLA) is located within exotic pine plantation within the Toolara, Tuan and Neerdie State Forests located in the Wide Bay Area (**Figure 1**). The Project Area (PLA) has a single landowner, being the State (represented by Department of National Parks, Sports and Racing), with land titles on which turbines are proposed, as follows:

- Lot 915 of Crown Plan FTY1775
- Lot 1004 of Crown Plan FTY1659
- Lot 1419 of Crown Plan FTY1697

The proposed wind turbine corridors and layout is illustrated in **Figure 2**.



<p>TITLE:</p> <h1 style="text-align: center;">Project Area and Regional Context</h1>	<p>LEGEND</p> <ul style="list-style-type: none"> ◆ Populated places • Nominal turbine locations — State controlled roads ▭ Project Area (PLA) ▭ Property boundaries ▭ Native state forest
<p>MAP NO: Figure 1</p>	
<p>PROJECT: Forest Wind Holdings Pty Ltd</p>	

Date: 10/02/2020

Data Source:
 © State of Queensland (Department of Natural Resources, Mines and Energy) 2019.

1.2 Wind Turbine Specifications

The Project proposes up to 226 turbines with a blade tip of up to 295m above ground level. Electrical reticulation between wind turbines will mainly be underground along existing forestry tracks.

The turbine to be installed is not yet confirmed, as such a range of impact has been considered based on highest to lowest potential tip height. To be conservative, at the upper limit, a maximum tip height of 295m and a lower tip height of 70m has been considered. The physical area swept by the blades during operation is referred to as the Rotor Swept Area (RSA). In reality the RSA will not extend across this entire height range but will be somewhere within it depending on final hub height and blade length of the installed turbines. Figure 2 shows this range and indicative potential RSAs.

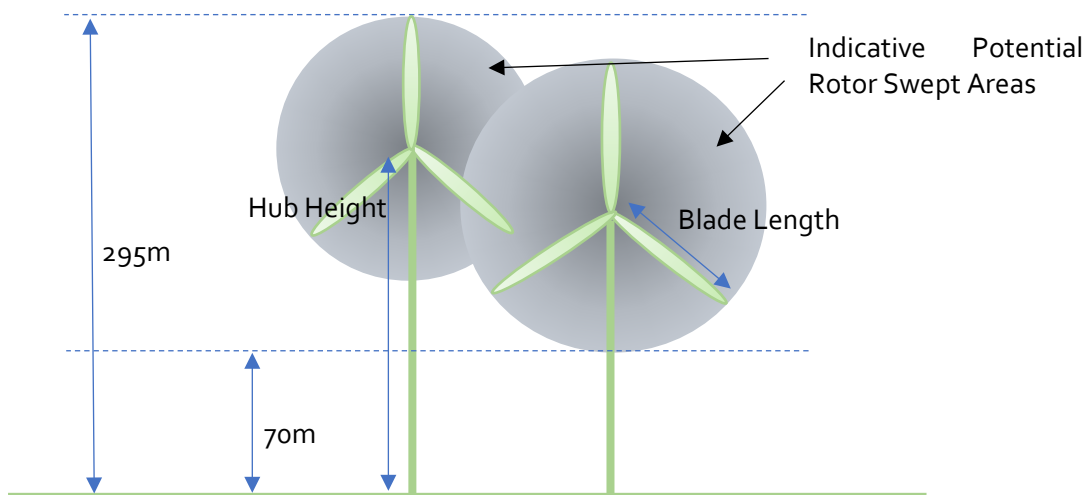


Figure 2 – Wind Turbine Specifications

1.3 Aim and Objectives

The aim of this assessment was to document the diversity and abundance of bird and bat species within and adjacent to the Project Area (PLA), with particular reference to the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) and/or *Nature Conservation Act 1994* (Qld) (NC Act) protected species susceptible to turbine blade collision impacts. Desktop assessments and targeted bird and bat surveys aimed to:

- Assess existing bird and bat data for the Project Area (PLA) and adjacent areas
- Describe the diversity of birds and bats in the Project area
- Undertake likelihood of occurrence assessments of least concern and threatened species which may occupy or use the Project Area (PLA)
- Assess the risk of collision of birds / bats based on occurrence, flight behavior, biology and turbine design
- Identify potential impacts
- Provide mitigation measures to avoid or reduce impacts which can be included in the design or implemented during construction and operation.

2 METHOD

A combination of desktop assessments, site assessments (including bird, microbat and flying-fox surveys) were conducted as part of this study. The desktop assessments included a review of relevant literature, mapping and database searches. The site assessments were conducted to obtain specific ecological information relevant to the Project Area (PLA). This section also outlines the terminology and nomenclature used in this report and describes the procedures and guidelines used in undertaking the assessment.

2.1 Desktop Assessment

A desktop assessment of available State and Commonwealth databases were undertaken to identify records or potential occurrences of least concern and conservation significant bird and bat species within and adjacent to the Project Area (PLA). The desktop assessment used the below databases and documents.

The Commonwealth Department of the Environment and Energy (DoEE) Protected Matters search tool (PMST) was used to identify species and vegetation communities listed under the EPBC Act that may occur within the search area. The PMST is a predictive database that identifies EPBC Act listed flora and fauna species with a Moderate Potential to Occur in each search area based on bioclimatic modelling.

Regional Ecosystems (REs) are vegetation communities that are consistently associated with a combination of geology, land form and soil within a bioregion. The Queensland Herbarium (DES) has mapped the remnant and pre-clearing extent of REs for the State using a combination of satellite imagery, aerial photography interpretation and on-ground studies. The latest version of the Regional Ecosystem Biodiversity Status Map (Version 11) illustrates the extent of REs as of 2017. REs can be used to predict the occurrence of suitable habitat.

The Department of Natural Resources, Mines and Energy (DNRME) Regulated Vegetation Management Map dataset was used to determine areas that are assessable and non-assessable under the provisions of the VM Act. The current *Vegetation Management Act 1999* (VM Act) Regional Ecosystem and Remnant Map, Essential Habitat point and polygon data and Property Maps of Assessable Vegetation (PMAVs) were used to determine the extent and type of remnant or regrowth vegetation within the Project Area (PLA).

The Queensland Department of Environment and Science (DES) Biomaps Online search tool was used to identify all species that have previously been recorded within the Project Area (PLA) and reported to DES.

The Atlas of Living Australia (ALA) database contains records of Australia's Virtual Herbarium (AVH) (Council of Heads of Australasian Herbaria, 2014) and the Online Zoological Collections of Australian Museums (OZCAM) (Council of Heads of Australian Faunal Collections, 2014) and provides information on all the known species in Australia aggregated from a wide range of data providers: museums, herbaria, community groups, government departments, individuals and universities. Database records for the Gympie Regional Council (GRC) and Fraser Coast Regional Council (FCRC) LGAs were reviewed, validated where required, and used to provide locations of any threatened species records within the area. GRC provided a list of Local Priority Species.

The DoEE National Flying-fox Monitoring Viewer (informed by the DoEE, National Flying-fox Monitoring Program (NFFMP) – flying-fox census) was reviewed to assess the trends of the flying-fox camps in the region, given that camps fluctuate over time (abundance and species present).

Refer Appendix C for search results.

2.2 Likelihood of Occurrence

An assessment was undertaken of the likelihood of occurrence for threatened fauna and flora species identified through the desktop review. The field survey further informed and verified this

likelihood of occurrence assessment. This report specifically refers to the birds and bats species that may be potentially found within the Project Area (PLA).

2.3 Field Assessments

2.3.1 Survey Timing and Climatic Conditions

The field surveys of the Project Area (PLA) were conducted between 2016 – 2019. Initial surveys were undertaken in December 2016 and March 2017 to provide additional information during the initial feasibility stage. Subsequent field surveys were undertaken monthly between October 2018 and April 2019 (inclusive) and weekly from February 2019 through to the end of April 2019. Monthly bird utilization surveys (BUS) surveys (refer Table 2) were specifically designed to capture the migratory period of EPBC Act migratory birds arriving or leaving the Ramsar listed Great Sandy Strait, in addition to other known migratory terrestrial birds identified in the initial feasibility assessments in 2016.

Table 1 summarises the climatic conditions on each bird survey.

Table 1 Weather Conditions During BUS Surveys¹

Date	Temp °C		Rain mm	Evap mm	Radiation MJ/m ²	Vapour Pressure hPa	Relative humidity		Mean sea level pressure hPa
	max	min					min%	max%	
8/12/2016	32.5	22.5	0	7.2	19	24	49.1	88.1	1012.5
15/03/2017	29.5	20	32.2	1.2	20	26	63.1	100	1013.5
23/10/2018	29	17.5	0	4.8	26	21	52.4	100	1017
24/10/2018	31	17.5	0	6	24	21	46.7	100	1017.5
29/11/2018	32.5	18	8.9	8.6	27	14	28.6	67.9	1006.5
18/12/2018	29	22.5	6.9	4	14	27	67.4	99.1	1010.5
16/01/2019	32.5	19	0	6.8	28	21	42.9	95.6	1014.5
14/02/2019	33	23.5	0.5	7.8	16	28	55.7	96.7	1010.5
20/02/2019	33.5	20.5	0	7	27	25	48.3	100	1008
27/02/2019	30	17.5	0.2	5.8	25	17	40.1	85.1	1019
4/03/2019	29	21	5.1	8.2	18	24	59.9	96.5	1019
14/03/2019	33	22.5	0.4	5.4	23	27	53.7	99.1	1014
20/03/2019	33	21	2.4	4.6	22	27	53.7	100	1012.5
25/03/2019	32	21	0	5	17	26	54.7	100	1016
10/04/2019	28.5	16.5	0.4	5.6	18	21	54	100	1017.5
17/04/2019	26.5	17	0.8	4.2	18	20	57.8	100	1020.5

¹ – BoM Weather Station: Tuan Creek Forest Station (40207), latitude -25.6778, longitude: 152.7928, extracted 20 August 2019.

2.3.2 Bird Utilisation Survey

139 fixed-point bird utilisation surveys (BUS) were undertaken between 2016 and 2019. The BUS assessments have been designed with reference to State Code 23: Wind Farm Development, Planning Guidelines (Queensland Government, June 2018). The survey was undertaken with consideration of relevant seasons (migratory period) and also a Before and After Control Impact (BACI) survey design, which continues during and post-construction to assess impacts. The BACI design includes reference sites placed at a sufficient distance from the proposed turbine locations to obtain data outside of the zone of influence of the turbines (State Code 23, June 2018).

The BUS are fixed-time point counts undertaken over a 20 minute period using a method adapted from Reynolds *et al.* (1980) and Biosis (2016). Point count locations are selected to provide sufficient representation of turbine locations across the entire wind farm. The following was recorded:

- Species
- Number of birds
- Height of bird above the ground
- Horizontal distance from observer to bird
- Weather conditions (cloud cover, wind direction, wind speed)

2.3.2.1 Survey Locations


Twenty-five (25) bird survey locations were established, of which seven (7) are considered reference sites. Locations were selected based on clear vantage points across the entire Project Area (PLA). This was generally in elevated positions or where the pine plantation had been harvested allowing a clear view. Bird survey locations are shown on Figure 3. Birds were also recorded from incidental locations. These are shown on Figure 3 if the birds recorded were at rotor height. Species observed where flight behaviour would exclude risk of impact (eg. emu) are recorded on the general bird species list, however they are not included on Figure 3 as incidental locations. BUS assessment site numbers and dates surveyed are provided in Table 2.

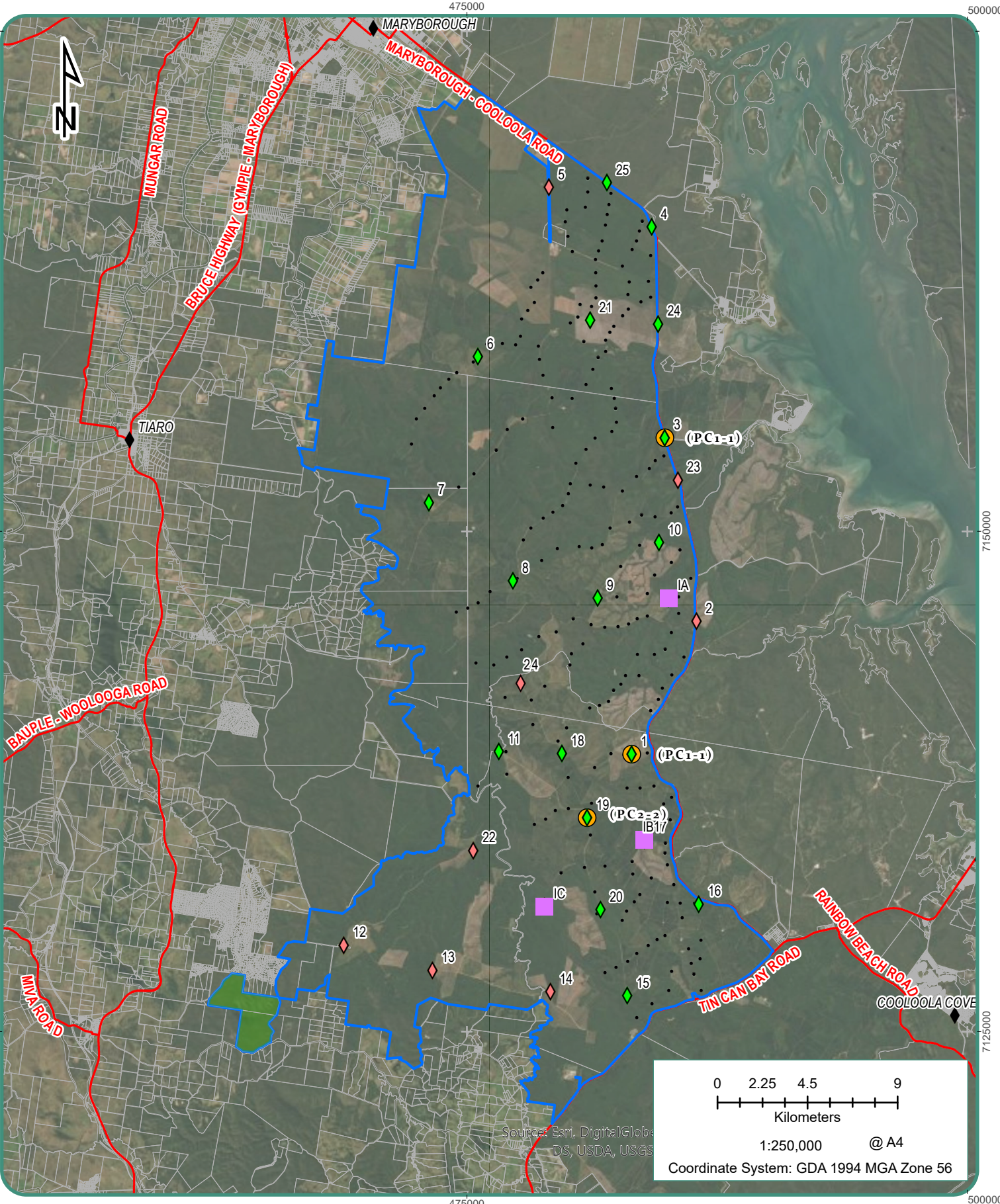
Table 2 Fixed-point BUS Assessments

Site	Date														
	2016	2017	2018			2019									
	8/12	15/3	23-24/10	29/11	18/12	16/1	14/2	20/2	27/2	4/3	14/3	20/3	25/3	10/4	17/4
1	X	X	X	X	X	X	X	X	X	X	X		X	X	X
2			X	X	X	X	X	X	X	X	X		X	X	X
3	X			X	X	X	X	X	X	X	X		X	X	X
4			X	X	X	X	X	X	X	X	X		X	X	X
5			X	X	X	X	X		X		X			X	X
6				X	X	X	X		X	X	X				
7				X	X	X	X	X	X	X	X	X			
8				X	X	X	X		X	X	X	X			
9				X	X	X			X	X			X		
10			X	X					X						


Site	Date														
	2016	2017	2018			2019									
	8/12	15/3	23-24/10	29/11	18/12	16/1	14/2	20/2	27/2	4/3	14/3	20/3	25/3	10/4	17/4
11					X	X			X		X	X			
12						X			X				X		
13					X	X	X		X		X		X		
14					X	X			X		X	X			
15						X	X	X		X				X	X
16							X	X		X	X		X	X	X
17				X											
18												X			
19		X				X									
20							X								
21			X					X							
22													X		
23								X		X		X			
24														X	X
25														X	X
Total	2	2	6	11	12	15	12	9	14	11	12	6	9	9	9

X = 20 minute fixed-point bird utilisation survey undertaken

 = reference site



TITLE: <h1>Bird Survey Locations</h1>		LEGEND	
MAP NO: Figure 3	PROJECT: Forest Wind Holdings Pty Ltd - Bird & Bat Utilisation Survey	• FWH Turbine locations (170m Ø)	— State controlled roads
		◆ Bird monitoring locations	▭ Project Area (PLA)
		◆ Reference sites	▭ Property boundaries
		● 2016/2017 surveys	■ Native state forest
		■ Incidental observation	



2.3.3 Bat Utilisation Survey

The echolocation calls of insectivorous bats were recorded using two (2) ultrasonic detectors (Songmeters) (SM2BAT® and SM4BAT) and stored on compact flash memory cards for later computer analysis and identification. The detector locations were selected based on:

- attempts to maximise diversity of bat species detected; and
- the degree to which the locations represent fauna habitat types within the Project Area (PLA).

Detectors were placed on the ground or on trees in suitably open areas (to maximise acoustic clarity) or flyways. Detectors were deployed across the Project Area (PLA) between 14 February 2019 and 26 March 2019. Songmeters were moved on a weekly basis over the 6-week period, which equates to 80 nights of recording. Batteries were changed each week and data was downloaded before re-deployment. All bat calls recorded were sent to a qualified and experienced bat-call analyst (Greg Ford; Balance Consulting) for identification.



A third songmeter (SM4) was also deployed during the same period. The SM4 records acoustic sounds such as birds and flying-foxes. Thirty-four (34) nights of acoustic recording was also undertaken across five locations during the same 6-week period. Table 3 identifies each site of Songmeter deployment with a brief habitat description.



A grey-headed flying-fox (GHFF) assessment was undertaken in accordance with the recommended DoEE (2019) survey approach. Least concern (NC Act) flying-fox species were also assessed. Given flying-fox occupy most areas in their distribution in highly irregular patterns, surveys based on animal sightings are unlikely to be reliable (DoEE, 2019). A more effective survey method is to search appropriate databases and other sources for the locations of camps, and to conduct vegetation surveys to identify feeding habitat (DoEE, 2019).



An inventory of the current status of 14 historical flying-fox camps within and near the scoping area was carried out on 7 December 2016 by Premise Australia. The locations of the flying-fox camps were informed by the DoEE National Flying-fox Monitoring Viewer (Department of the Environment, 2015l) and DES flying-fox roost monitoring locations (Department of Environment and Heritage Protection, 2016a). Species present and estimated camp size were recorded. The flying-foxes were observed leaving one camp (the closest camp to the study area) for the evening to understand the general direction of travel relative to possible placement of turbines, although the dispersal direction may be influenced by climatic conditions and food availability.



The DoEE National Flying-fox Monitoring Viewer (informed by the DoEE, National Flying-fox Monitoring Program (NFFMP) – flying-fox census) was again reviewed in 2019 to assess the status of the flying-fox camps in the region, given that camps fluctuate over time (abundance and species present). The NFFMP determines camp activity, camp size and which of the four (4) flying-fox species are utilising the camp (grey-headed flying-fox (GHFF), little red flying-fox (LRFF), spectacled flying-fox (SFF) and black flying-fox (BFF)).



Table 3 Bat Monitoring Locations



Site	Machine ID	Start Date	End Date	Nights recorded	Lat	Long	Habitat Description	Photo Log
1	SM2BAT ¹	14/02/2019	20/02/2019	6	-25.93565	152.86038	Mature pine forest. Less than 500m from remnant patch (SM4BAT was deployed in adjacent remnant for same period to compare difference between pine/remnant within flying distance). Large black feral cat observed.	
2	SM4BAT ¹	14/02/2019	20/02/2019	6	- 25.93553762	152.8518821	Remnant. Iron bark, <i>E. propinqua</i> (grey gum), <i>Corymbia citriodora</i> subsp. <i>variegata</i> (spotted gum), <i>C. intermedia</i> (pink bloodwood), lantana and grass trees. Hollow bearing trees present (HBT). Less than 1km from above pine forest and deployed over same nights to compare difference in utilisation.	



Site	Machine ID	Start Date	End Date	Nights recorded	Lat	Long	Habitat Description	Photo Log
3	SM4 ²	14/02/2019	20/02/2019	6	- 25.72005957	152.7239289	Logging Creek (acoustic recorder only ie. birds, frogs and flying-fox)	
4	SM2BAT ¹	20/02/2019	27/02/2019	7	- 25.62811728	152.8205834	Mature pine plantation in northern end of site	




Site	Machine ID	Start Date	End Date	Nights recorded	Lat	Long	Habitat Description	Photo Log
5	SM4BAT ¹	20/02/2019	27/02/2019	7	- 25.67289676	152.8120367	Young pine plantation. Proximate to above mature pine and deployed over same nights to compare utilisation between young and mature pine.	
6	SM4 ²	20/02/2019	27/02/2019	7	- 25.82897261	152.7823004	Sugarloaf Creek. Permanent creek in the Project Area (PLA). Deployed on <i>Melaleuca</i> .	

Site	Machine ID	Start Date	End Date	Nights recorded	Lat	Long	Habitat Description	Photo Log
7	SM2BAT ¹	27/02/2019	4/03/2019	5	-25.72060523	152.7240862	Logging Creek. Permanent creek in the Project Area (PLA). Deployed 11:30am.	
8	SM4BAT ¹	27/02/2019	4/03/2019	5	-25.74517199	152.7224208	Deployed in mature pine. Weedy understorey of lantana, ciratro and blue billy-goat weed. Proximate to Logging Creek (western side of site) to compare between remnant creek line and mature pine utilisation. Same nights.	

Site	Machine ID	Start Date	End Date	Nights recorded	Lat	Long	Habitat Description	Photo Log
9	SM4 ²	27/02/2019	4/03/2019	5	- 25.88919476	152.755775	Tinana Creek, approximately 50m upstream from Raintree Bridge. Creek appears in good condition in this area and appears to flow permanently. Pools, riffles, shaded areas, good instream structure, tanin stained. Approx 7m wide.	
10	SM4BAT ¹	4/03/2019	14/03/2019	10	- 25.8028659 4	152.7933323	Remnant patch of native vegetation including <i>Corymbia</i> sp., hollows	

Site	Machine ID	Start Date	End Date	Nights recorded	Lat	Long	Habitat Description	Photo Log
11	SM2BAT ¹	4/03/2019	14/03/2019	10	- 25.83658447	152.7772792	Pine plantation. Pine approximately 10m tall. Bracken fern. Weedy understorey, lantana. To compare pine utilisation to above remnant. Same nights.	
12	SM4 ²	4/03/2019	14/03/2019	10	- 25.91570605	152.7544686	Sandy Creek. Permanent Creek running through Project Area PLA.	

Site	Machine ID	Start Date	End Date	Nights recorded	Lat	Long	Habitat Description	Photo Log
13	SM2BAT ¹	14/03/2019	20/03/2019	6	- 25.74430054	152.8473066	Semi-mature pine plantation. Bracken fern undergrowth.	
14	SM4 ²	14/03/2019	20/03/2019	6	- 25.91409343	152.8084228	Scrubber Creek. 40m west of crossing. Ephemeral. Series of pools with pine debris in some areas.	

Site	Machine ID	Start Date	End Date	Nights recorded	Lat	Long	Habitat Description	Photo Log
15	SM4BAT ¹	14/03/2019	20/03/2019	6	- 25.92587903	152.7931573	Remnant patch just north of Tinana Creek crossing. Large remnant area full of spotted gums and HBTs. Regrowth <i>Allocasuarina littoralis</i> and <i>Corymbia</i> . Good habitat for microbats due to proximity of water and abundant small hollows.	
16	SM4BAT ¹	20/03/2019	26/03/2019	6	- 25.95451283	152.6895083	Southern end of site (sw). In young pine up to approx 8m high.	
17	SM2BAT ¹	20/03/2019	26/03/2019	6	- 25.97079857	152.7293415	Young pine (1-2m high). Abundant coarse woody debris (pine spoil from previous harvest). Weedy. No remnant vegetation proximate to location. Large open areas due to all young pine.	

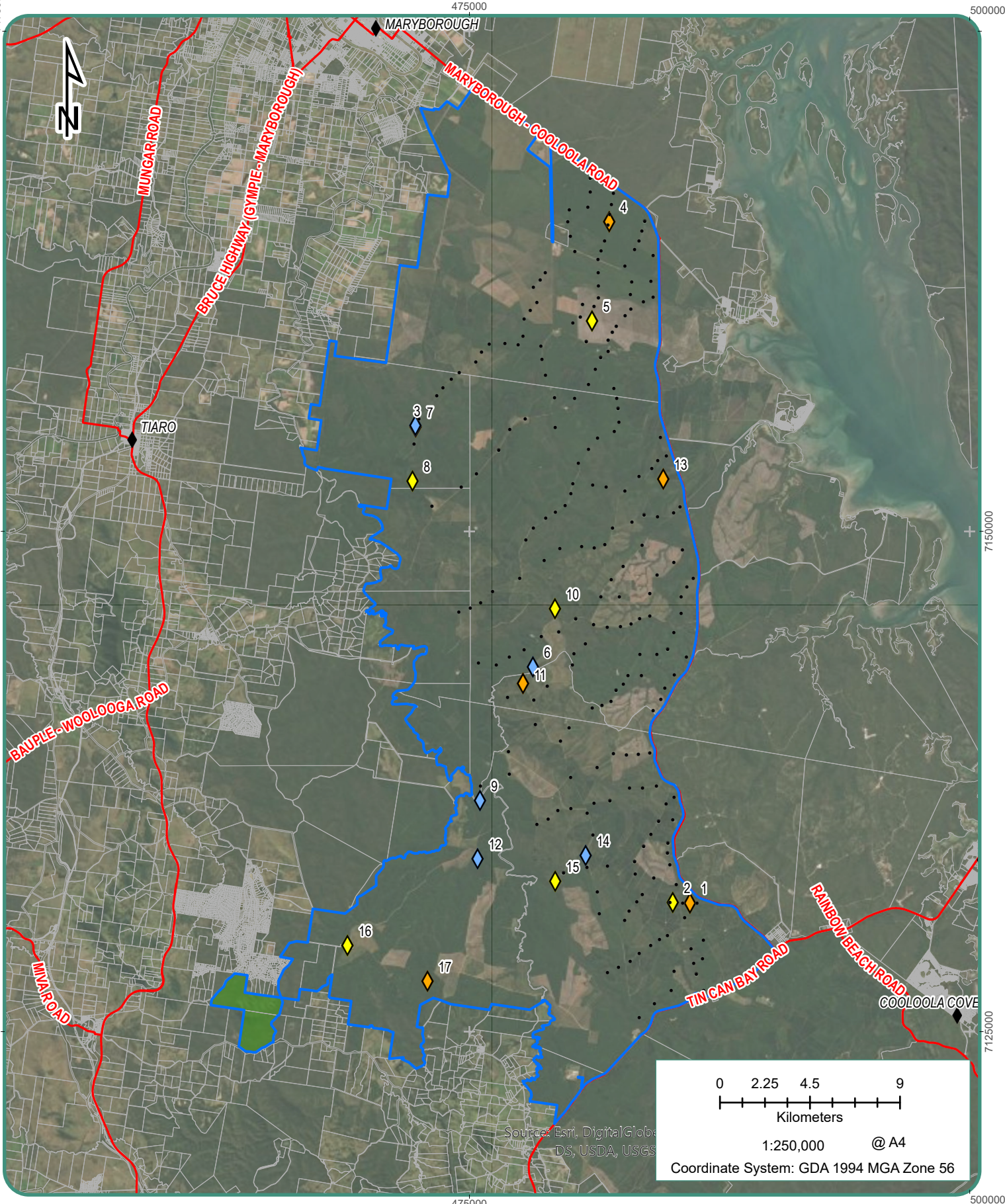
¹ - SM2BAT and SM4BAT are ultrasonic recorders which specifically record echolocations of microbat species. ² - SM4 is an acoustic recorder which records audible sounds such as megabats (flying foxes), birds and frogs. This machine does not record echolocations of micro-bat species. This machine was specifically targeted in areas of potential flying-fox foraging and creek lines considered suitable for amphibian activity.

2.3.4 Nocturnal Surveys

Nocturnal surveys were undertaken to assist with identifying flying-fox presence within the Project Area (PLA). Surveys were undertaken in 2016 at the closest known flying-fox camp (at the time of the survey this was Anderleigh Road Camp at Maaroom which was not active in 2016) to monitor the direction of dispersal in the evening, although this may vary depending on climatic conditions and food source availability.

Nocturnal surveys were also undertaken by 2-personnel using spotlights in remnant woodland habitat over a 2-night period in June 2019. The timing was selected following a nocturnal survey (2-personnel over 2-nights) in the Native State Forest (NSF) portion of the Project Area (PLA) where GHFF were observed feeding in remnant eucalypt woodland. This site was able to be used as a reference site for the Project Area (PLA).

Document Path: C:\Users\greenvale\Documents\Fox & Co Environmental\Projects\Forest Wind Holdings Pty Limited\1. Wind farm\Bird and Bat Utilisation Survey Report\Bird_and_bat_survey\Bird_and_bat_survey.aprx



TITLE: <h1>Bat Survey Locations</h1>		LEGEND		
MAP NO: Figure 4		<ul style="list-style-type: none"> • FWH Turbine locations (170m Ø) ◆ SM2BAT1 ◆ SM42 	<ul style="list-style-type: none"> ◆ SM4BAT1 — State controlled roads ▭ Project Area (PLA) ▭ Property boundaries 	
PROJECT: Forest Wind Holdings Pty Ltd - Bird & Bat Utilisation Survey		<p>Source: Esri, DigitalGlobe, GeoEye, IGN, AerGRID, Airbus, USDA, USGS</p> <p>1:250,000 @ A4 Coordinate System: GDA 1994 MGA Zone 56</p>		

Date: 10/02/2020

Data Source: © State of Queensland (Department of Natural Resources, Mines and Energy) 2019.

3 RESULTS

3.1 Desktop Results

184 bird species and seven (7) bat species have previously been recorded within the Project Area (PLA) (Wildnet). Most are least concern species listed under the NC Act and/or not listed under the EPBC Act. Wildnet records are included in Appendix C. Three (3) flying-fox species are known to occur in the region. Further details are provided in Section 3.2.5.

Table 4 lists all the threatened bird and bat species identified in the desktop searches. Not all the threatened species indicated in Table 4 are expected to occur within the Project Area (PLA) due to the absence of suitable habitat for some species. Further details are provided in the Likelihood of Occurrence Tables in the *Ecological Assessment Report, Forest Wind Project* (Fox & Co Environmental, 2019).

Table 4 Threatened Bird and Bat Species Potentially Occurring

Scientific Name	Common Name	EPBC Act ¹	NC Act ²	GRC ³
Bats				
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	LC	-
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	LC	-
Birds				
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	E	-
<i>Botaurus poiciloptilus</i>	Australian Bittern	E	LC	-
<i>Calidris canutus</i>	Red Knot, Knot	E, MW, LM	E	-
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE, MW, LM	E	-
<i>Calidris tenuirostris</i>	Great Knot	CE, MW, LM	E	-
<i>Charadrius leschenaultii</i>	Greater Sand Plover	V, MW, LM	V	-

Scientific Name	Common Name	EPBC Act ¹	NC Act ²	GRC ³
<i>Charadrius mongolus</i>	Lesser Sand Plover	E, MW, LM	E	-
<i>Cyclopsitta diophthalma coxeni</i>	Coxen's Fig-Parrot	E	E	-
<i>Erythrotriorchis radiatus</i>	Red goshawk	V	E	-
<i>Fregetta grallaria grallaria</i>	White-bellied Storm Petrel	V	LC	-
<i>Geophaps scripta scripta</i>	Squatter Pigeon	V	V	-
<i>Hirundapus caudacutus</i>	White-throated Needletail	V, MT, LM	SLC	-
<i>Lathamus discolor</i>	Swift Parrot	E, LM	E	-
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit	V, M, LM	V	-
<i>Limosa lapponica menzbieri</i>	Northern Siberian Bar-tailed Godwit	CE, M	E	-
<i>Numenius madagascariensis</i>	Eastern Curlew	CE, MW, LM	E	-
<i>Pachyptila turtur subantarctica</i>	Fairy Prion (southern)	V, LM	LC	-
<i>Poephila cincta cincta</i>	Southern Black-throated Finch	E	E	-
<i>Rostratula australis</i>	Australian painted snipe (syn. <i>Rostratula benghalensis</i>)	E, LM, MW	V	-
<i>Turnix melanogaster</i>	Black-breasted Button-quail	V	V	-

Scientific Name	Common Name	EPBC Act ¹	NC Act ²	GRC ³
<i>Calyptrorhynchus lathamii lathamii</i> (eastern subspecies)	Glossy Black Cockatoo	-	V	-
<i>Pezoporus wallicus wallicus</i>	Ground parrot	-	V	-
<i>Ninox strenua</i>	Powerful owl	-	V	-
Listed Migratory Species				
Migratory Marine Birds				
<i>Anous stolidus</i>	Common Noddy	MM, LM	SLC	-
<i>Apus pacificus</i>	Fork-tailed Swift	MM, LM	SLC	-
Migratory Terrestrial Species				
<i>Cuculus optatus</i>	Oriental cuckoo	MT	SLC	-
<i>Monarcha melanopsis</i>	Black-faced monarch	MT, LM	SLC	-
<i>Monarcha trivirgatus</i> (syn. <i>Symposiarchus trivirgatus</i>)	Spectacled Monarch	MT, LM	SLC	-
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	MT, LM	SLC	-
<i>Rhipidura rufifrons</i>	Rufous Fantail	MT, LM	SLC	-
Migratory Wetlands Species				
<i>Actitis hypoleucos</i>	Common Sandpiper	MW, Ma	SLC	-
<i>Arenaria interpres</i>	Ruddy Turnstone	MW, LM	SLC	-
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	MW, LM	SLC	-
<i>Calidris alba</i>	Sanderling	MW, LM	SLC	-

Scientific Name	Common Name	EPBC Act ¹	NC Act ²	GRC ³
<i>Calidris melanotos</i>	Pectoral Sandpiper	MW, LM	SLC	-
<i>Calidris ruficollis</i>	Red-necked Stint	MW, LM	SLC	-
<i>Calidris subminuta</i>	Long-toed Stint	MW, LM	SLC	-
<i>Charadrius bicinctus</i>	Double-banded Plover	MW, LM	SLC	-
<i>Gallinago hardwickii</i>	Latham's Snipe	MW, LM	SLC	-
<i>Limosa limosa</i>	Black-tailed Godwit	MW, LM	SLC	-
<i>Numenius phaeopus</i>	Whimbrel	MW, LM	SLC	-
<i>Pandion haliaetus</i>	Osprey	MW, LM	SLC	-
<i>Pluvialis fulva</i>	Pacific Golden Plover	MW, LM	SLC	-
<i>Pluvialis squatarola</i>	Grey Plover	MW, LM	SLC	-
<i>Tringa brevipes</i>	Grey-tailed tattler	MW, LM	SLC	-
<i>Tringa nebularia</i>	Common greenshank	MW, LM	SLC	-
<i>Tringa stagnatilis</i>	Marsh Sandpiper	MW, LM	SLC	-
<i>Xenus cinereus</i>	Terek Sandpiper	MW, LM	SLC	-
Listed Marine Species				
<i>Anseranas semipalmata</i>	Magpie Goose	LM	SLC	-

Scientific Name	Common Name	EPBC Act ¹	NC Act ²	GRC ³
<i>Ardea alba</i> (syn. <i>A. modesta</i>)	Great Egret, White Egret	LM	SLC	-
<i>Ardea ibis</i>	Cattle egret (syn. <i>Bubulcus ibis</i>)	LM	SLC	-
<i>Charadrius ruficapillus</i>	Red-capped Plover	LM	SLC	-
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle	LM	SLC	-
<i>Himantopus himantopus</i>	Black-winged Stilt	LM	SLC	-
<i>Merops ornatus</i>	Rainbow bee-eater	LM	SLC	-
<i>Recurvirostra novaehollandiae</i>	Red-necked Avocet	LM	SLC	-
Gympie Regional Council				
<i>Eopsaltria australis</i>	Eastern Yellow Robin	NL	LC	LPS
<i>Pitta versicolor</i>	Noisy Pitta	NL	LC	LPS
<i>Lopholaimus antarcticus</i>	Topknot Pigeon	NL	LC	LPS
<i>Ptilinopus magnificus</i>	Wompoo fruit dove	NL	LC	LPS

¹ – EPBC Act: CE – Critically endangered, E – Endangered, V – Vulnerable, MM – Migratory Marine, MT – Migratory Terrestrial Species, MW – Migratory Wetland Species, LM – Listed Marine Species, NL – Not Listed

² - NC Act: E – Endangered, V – Vulnerable, SLC – Special Least Concern, LC – Least Concern

LPS – GRC Local Priority Species

³ – Gympie Regional Council Local Priority Species (LPS)

3.2 Field Survey Results

3.2.1 Bird Utilisation Survey

Bird surveys recorded 66 bird species across the Project Area (PLA). Refer to **Appendix A** for the bird species list. The following five (5) species of conservation significance were recorded:

1. White-throated needletail (WTN) (*Hirundapus caudacutus*) – V, MT, LM (EPBC Act)
2. Fork-tailed swift (FTS) (*Apus pacificus*) – MT (EPBC Act)
3. Spectacled monarch (*Monarcha trivirgatus* (syn. *Symposiarchus trivirgatus*)) – LM, MT (EPBC Act)

4. Rainbow bee-eater (*Merops ornatus*) – LM (EPBC Act)
5. Cicadabird (*Coracina tenuirostris*) – LM (EPBC Act)

No migratory shorebirds were observed within the wind turbine study area or flying over the Project Area (PLA) on any of the bird surveys.

Seven (7) Least Concern (NC Act) raptor species were recorded on site. None of the raptors are listed species under the EPBC Act or NC Act.

One (1) large water bird (white-necked heron (*Ardea pacifica*)) was observed flying over the site. White-necked herons are not listed under the EPBC Act or NC Act.

3.2.2 Species Diversity and Abundance

The most common birds observed were Torresian crows (*Corvus orru*) and noisy friarbirds (*Philemon corniculatus*), being recorded on all surveys across the Project Area (PLA). All 66 birds recorded are shown on Figure 5 with their minimum and maximum flight height observed during surveys. Some birds recorded at heights less than the RSA height have the potential to fly at or above the RSA height and are also included the collision risk assessment. Whilst it is important to consider conservation significant species in collision risk assessment because the consequences of mortality may be more severe, it is also important to considered common (least concern) species to provide a better understanding of species at risk, which is important for mitigation and continual adaptive management. Least Concern species observed and/or likely to occur (based on previous Wildnet records) are included in the collision risk assessment provided in Section 4.2.

White-throated needletails (*Hirundapus caudacutus*) (WTN) were observed in the highest numbers. This species was recorded on nine of the 16 survey days (22 of the 139 fixed-point BUS assessments). Seven (7) of the 22 BUS assessments they were reported in numbers greater than 10 (on 4 days of the 16 survey days) as outlined in Table 5. The first initial BUS undertaken in December 2016 identified the greatest number of individuals, with a flock of 327 reported at 50m – 100m above ground level. One other survey (18 December 2018) reported flocks greater than 100 individuals with 165 being recorded between 30m – 200m above ground level.

Table 5 White-throated Needletails Exceeding 10 Individuals¹

Site	Date	Number of individuals	Height (m above ground level)
1	8 December 2016	327	50-100m
3	8 December 2016	56	20 – 150m
19	15 March 2017	17	60m
7	18 December 2018	165	30 – 200m
8	18 December 2018	16	30m
9	18 December 2018	83	50m
7	20 February 2019	12	50m

¹ – at a National level, an important population is 0.1% of the total population (total population estimated at least 10,000 individuals), which equates to 10 WTN (Draft referral guideline for 14 birds listed migratory under the EPBC Act (DoE, 2015)).

Fork-tailed swifts (FTS) were recorded on four of the 16 survey days (15 of the 139 fixed-point BUS assessments). One (1) survey (29 November 2018) recorded up to 51 individuals at one site (they were recorded at most sites surveyed during that survey). Bushfires in the Wide Bay area on the 29 November 2018 (the small township of Tinnanbar was cut off by bushfires) correlated with the

highest number of FTS recorded. This is consistent with their known flight behaviour (refer Table 8). WTN were also recorded during the same survey.

A pair of spectacled monarchs (*Symposiarchus trivirgatus*) (EPBC Act – LM, MT) were observed in the understory along Tinana Creek within the vine forest in January 2020. Spectacled monarchs are a bird species that commonly occur in vine forest.

Rainbow bee-eaters were recorded on seven of the 16 survey days (10 of the 139 fixed-point BUS assessments). Two (2) cicadabirds were observed at one location in 2016.

3.2.3 Flight Heights

The risk assessment for collision based impacts has considered the likelihood of occurrence, typical flight behaviour, distribution and biology. Risk categories are:

- Low Risk: low flight behavior with the species typically foraging just above the tree canopy and below it.
- Medium Risk: has the potential to occasionally fly at RSA height and suitable habitat is present in the Project Area (PLA) or immediately adjacent to it
- High Risk: known to regularly fly at or above RSA height, aerial insectivore foragers and suitable habitat present on or adjacent to the site

Approximately 71% (47 of the 66) of all bird species recorded during the surveys are considered low risk of collision due to their low-flight behaviour. Most birds were recorded at less than 30m above ground level as shown on Figure 5. Some of these birds possess flight behaviour that may potentially put them within the RSA and are therefore included in the collision risk assessment.

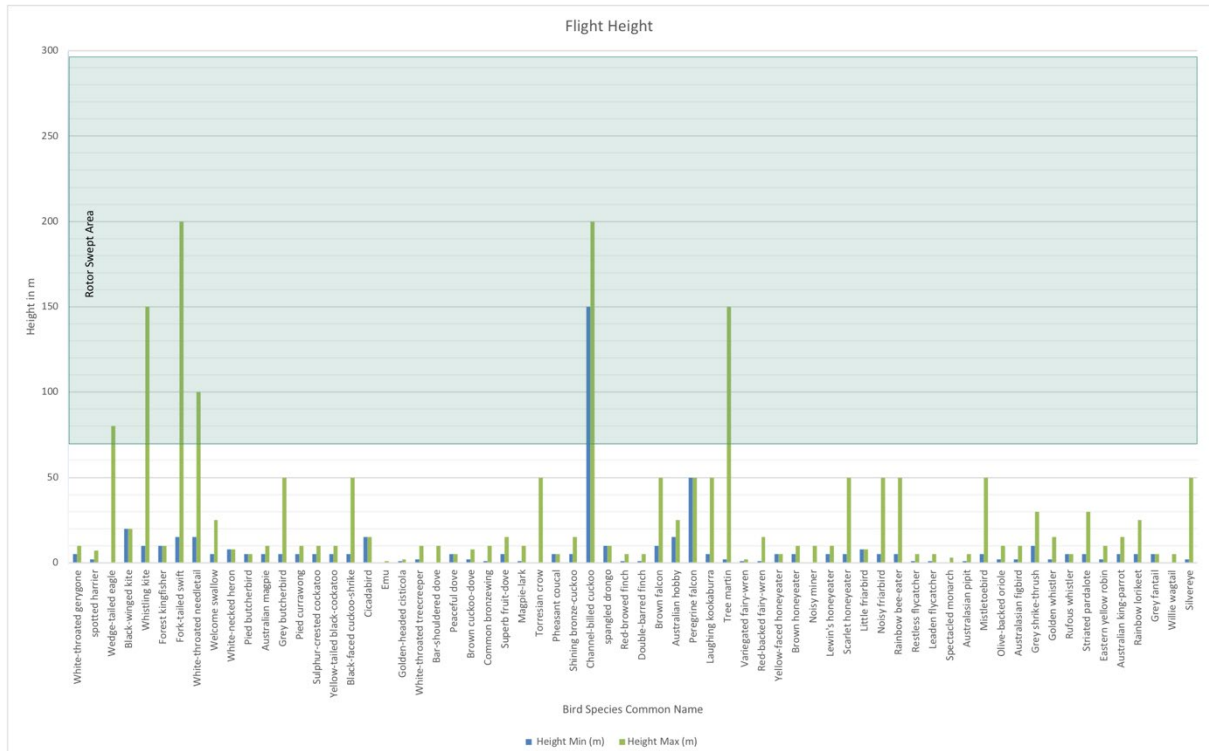


Figure 5 – Bird Flight Ranges on Project Area (PLA)

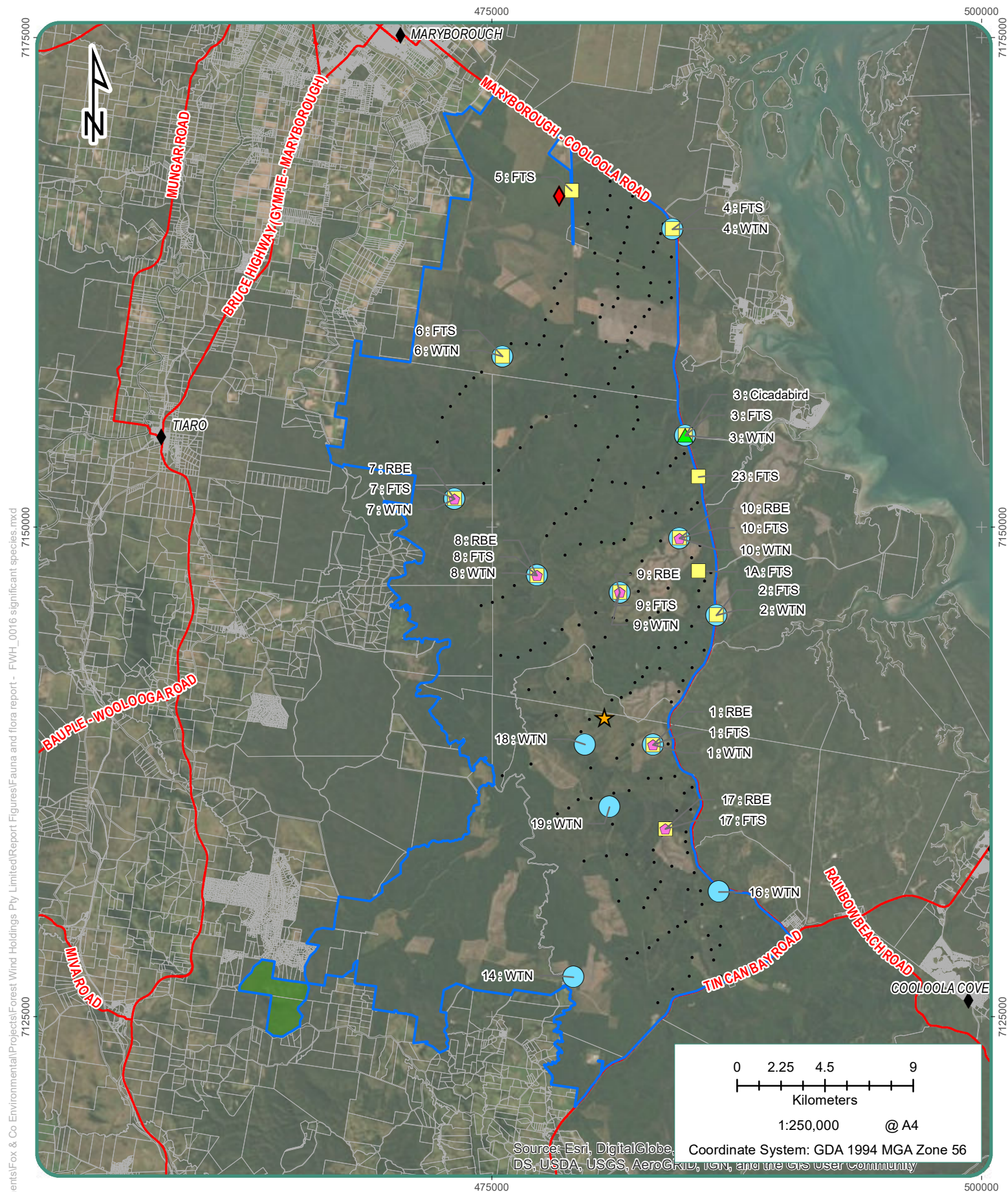
The following 19 birds recorded on the Project Area (PLA) are known to exhibit moderate to high risk flight behaviour.

1. White-throated needletail (*Hirundapus caudacutus*) – V, MT, LM (EPBC Act)
2. Fork-tailed swift (*Apus pacificus*) – MT (EPBC Act)
3. Whistling kite (*Haliastur sphenurus*) – Least Concern (LC) (NC Act)
4. Channel-billed cuckoo (*Scythrops novaehollandiae*) – LC (NC Act)
5. Tree martin (*Petrochelidon nigricans*) – LC (NC Act)
6. Spotted harrier (*Circus assimilis*) – LC (NC Act)
7. Black-shouldered kite (*Elanus axillaris*) – LC (NC Act)
8. Wedge-tailed eagle (*Aquila audax*) – LC (NC Act)
9. Welcome swallow (*Hirundo neoxena*) – LC (NC Act)
10. White-necked heron (*Ardea pacifica*) – LC (NC Act)
11. Brown falcon (*Falco berigora*) – LC (NC Act)
12. Australian hobby (*Falco longipennis*) – LC (NC Act)
13. Peregrine falcon (*Falco peregrinus macropus*) – LC (NC Act)
14. Rainbow bee-eater (*Merops ornatus*) – LM (EPBC Act)
15. Cicadabird (*Coracina tenuirostris*) – LM (EPBC Act)
16. Torresian crow (*Corvus orru*) – LC (NC Act)
17. Australian magpie (*Gymnorhina tibicen*) – LC (NC Act)
18. Sulphur-crested cockatoo (*Cacatua galerita*) – LC (NC Act)
19. Yellow-tailed black-cockatoo (*Calyptorhynchus funereus*) – LC (NC Act)

All of the raptors are included although only whistling kite and wedge-tailed eagle were observed flying within the RSA height. The tree martins, welcome swallows and rainbow bee-eaters were all observed below RSA height, however they have also been included as at moderate risk of impact due to being aerial insectivores and therefore influenced by atmospheric conditions and insect height. The white-necked heron was also observed below RSA height although are considered to have a moderate risk flight behaviour. Torresian crows and Australian magpies whilst observed within the Project Area (PLA) below 30m have been included due to their potential to fly with the RSA.

Other least concern species not recorded during surveys although have the potential to occur (based on previous Wildnet records in the Project Area (PLA)), with a moderate to high risk of collision include wedge tailed eagle (*Aquila audax*), Australian pelican (*Pelecanus conspicillatus*), Australian white ibis (*Threskiornis molucca*), straw-necked ibis (*Threskiornis spinicollis*). These are also included in the risk assessment for collision based impacts in Section 4.2.2

Figure 6 shows birds of conservation significance identified during BUS.



TITLE:

Conservation Significant Species

MAP NO: Figure 6

PROJECT: Forest Wind Holdings Pty Ltd - BBUS Report

LEGEND

Wallum froglet	Swamp Crayfish	Native state forest
Cicadabird	Populated Places	
Rainbow bee-eater	FWH Turbine locations	
Fork-tailed swifts	Project Area (PLA)	
White-throated Needtail		

Date: 10/02/2020

Data Source:
© State of Queensland (Department of Natural Resources, Mines and Energy) 2019.

Document Path: C:\Users\greenvale\Documents\Fox & Co Environmental\Projects\Forest Wind Holdings Pty Limited\Report\Figures\Fauna and Tiara report - FWH_0016 significant species.mxd

3.2.4 Bat Utilisation Survey

GHFF were observed feeding in the flowering eucalypts within the NSF portion of the Project Area (PLA) during nocturnal surveys in June 2019. No other flying-fox species were recorded within the Project Area (PLA).

Up to 14 microbat species were recorded during the bat surveys. Eleven call-types were positively identified to ten unique species plus the *Nyctophilus* genus (refer **Appendix B**). Up to three *Nyctophilus* species potentially occur in the study area (*N. bifax*, *N. geoffroyi* and *N. gouldi*), however their calls cannot be reliably differentiated. All three *Nyctophilus* species are least concern under the NC Act and the EPBC Act. Three other call-types were identifiable only to mixed-species groups because they had variable or intermediate pulse-characteristics. Two of those groups contained species that were otherwise reliably identified (*Chalinolobus gouldii*/*Ozimops ridei* and *C. nigrogriseus*/*Scotorepens greyii*). The third group – *Vespadelus troughtoni*/*Chalinolobus morio* – potentially represented two additional species that was not otherwise recorded. Where these “unresolved calls” were encountered, all members of the relevant group were listed as “probable” (refer **Appendix B**) unless positively identifiable calls of one or both species were also observed.

Microbat species positively identified on the Project Area (PLA) are listed below. All microbat species recorded are least concern species under the NC Act and are not listed under the EPBC Act.

1. Eastern horseshoe bat (*Rhinolophus megaphyllus*)
2. Gould’s wattled bat (*Chalinolobus gouldii*)
3. Hoary wattled bat (*Chalinolobus nigrogriseus*)
4. *Nyctophilus* sp.
5. Little broad-nosed bat (*Scotorepens greyii*)
6. Little bent-wing bat (*Miniopterus australis*)
7. Australian bent-wing bat (*Miniopterus orianae*)
8. White-striped freetail bat (*Austronomus australis*)
9. Ride’s free-tailed bat (*Ozimops ridei*)
10. Northern free-tailed bat (*Ozimops lumsdenae*)
11. Yellow-bellied sheath-tail bat (*Saccolaimus flaviventris*)

Almost 95% (576) of the calls were positively identified, with 83% (504 calls) attributable to just three species: *C. nigrogriseus*, *O. ridei*, and *Saccolaimus flaviventris*. These 3 species are least concern under the NC Act and EPBC Act.

No threatened microbat species were recorded.

Table 11 provides a risk assessment of potential consequence of collision for all bat species identified. Refer to **Appendix B** for the microbat report.

3.2.5 Flying-foxes

There are three (3) species of megabats (flying-foxes) known to occur in the region.

1. Grey-headed flying-fox (GHFF) (*Pteropus poliocephalus*) – (EPBC Act – Vulnerable, NC Act – Least Concern)
2. Little red flying-fox (LRFF) (*Pteropus scapulatus*) – (EPBC Act – Not Listed, NC Act - Least Concern)
3. Black flying-fox (BFF) (*Pteropus alecto*) – (EPBC Act – Not Listed, NC Act – Least Concern)

3.2.5.1 Grey-headed Flying-fox

There are seven (7) GHFF camps within 50km of the Project Area (PLA) that have been occupied by GHFF within the past 2 years.

1. Glenwood Varley Road (53)
2. Maaroom, Esplanade (209)
3. Goomboorian, Anderleigh Road Ginger Creek (55)
4. Maryborough, Kent Street (88)
5. Maryborough, Albion Road Wetlands (Island Plantation) (87)
6. Gympie (53)
7. Woocoo (171)

The definition of a Nationally Important GHFF Camp is defined for the management of GHFF and spectacled flying-fox camps, specifically relating to *in-situ* camp management. Camps that have contained $\geq 10,000$ GHFF in more than one year in the last 10 years, or have been occupied by more than 2,500 GHFF permanently or seasonally every year for the last 10 years (EPBC Policy Statement, September 2015).

As such, the closest Nationally Important GHFF camps are Maaroom, Glenwood Varley Road, Gympie and Woocoo, which are 4km, 14km, 30km and 40km away from the nearest turbine location, respectively (refer **Figure 6**).

Additional flying-fox camps are shown on **Figure 6**. These camps have either been surveyed and no flying-foxes were found (as per the NFFMP), are considered inactive or have not had any flying-fox activity for five (5) years or more.

Table 6 provides a summary of the latest GHFF camps/counts (DoEE, NFFMP).

Table 6 Grey-headed flying-fox Camps within 50km of the Project Area (PLA)

Camp Name/ ID	Distance from turbines (km)		Counts/Category	Date of survey activity	Notes
	Minimum	Maximum			
Glenwood Varley Road (53)	16km	39km	16,000 – 49,000 (category 5)	August 2018	$\geq 10,000$ GHFF 3 times in the last 10 years (2012, 2015, 2018)
Maaroom, Esplanade (209)	4km	42km	500 – 2,499 (category 2)	May 2018	$\geq 10,000$ GHFF twice in the last 10 years (2015, 2017)
Goomboorian, Anderleigh Road Ginger Creek (55)	9km	49km	2,500 – 9,999 (category 3)	August 2018	
Maryborough, Kent Street (88)	12km	51km	1-499 (category 1)	May 2018	No GHFF in November 2018
Maryborough, Albion Road	14km	55km	10,000 – 15,999	May 2017	

Camp Name/ ID	Distance from turbines (km)		Counts/Category	Date of Survey	Notes
Wetlands (Island Plantation) (87)			(category 4)		
Gympie (59)	30km	66km	500-2,499 (category 2)	February 2018	Nationally Important GHFF Colony
Woocoo (171)	40km	65km	>50,000 (category 6)	November 2018	Nationally Important GHFF Colony. Located in Woocoo National Park

3.2.5.2 Black Flying-fox

The black flying-fox is Least Concern under the NC Act and not listed under the EPBC Act. The black flying-fox is a migratory species that roosts in large numbers high in the tree canopy during the day. Females become pregnant before the bats disperse into generally smaller camps for the winter. They re-congregate into large camps during spring and summer, when birthing occurs (Australian Museum, 2020).

Table 7 shows the black flying-fox camps within 50km. They are often mixed camps with BFF and/or GHFF and fluctuate over time. The Gympie camp has historically (since 2012) had the most numbers of BFF of the camps within 50km of the Project Area (PLA). Black flying-foxes have a general home range of 15 – 30km, however can travel over 50km from their camp to a feeding area (Australian Museum, 2020). The largest BFF camp in the area is 30km from the nearest point of the Project Area (PLA) boundary and therefore is at the extent of its general home range when dispersing to feed. Dispersal between camps in the area is unknown and will depend on food availability.

Table 7 provides a summary of the latest BFF camps/counts (DoEE, NFFMP).

Table 7 Black Flying-fox Camps within 50km of the Project Area (PLA)

Camp Name/ ID	Distance from turbines (km)		Counts/Category	Date of survey activity	Notes
	Minimum	Maximum			
Maryborough, Kent Street (88)	12km	51km	2,500-9,999 (category 3)	November 2018	Sometimes mixed camp with GHFF and LRFF
Maaroom, Esplanade (209)	4km	42km	10,000 – 16,000 (category 4)	May 2017	No BFF since May 2018 census.
			2,500 – 10,000 (category 3)	May 2018	
Gympie (59)	30km	66km	2,500-9,999	November	Was cat 5 in Aug

Camp Name/ ID	Distance from turbines (km)		Counts/Category	Date of survey	Notes
			(category 3)	2018	2017 and Feb 2018 (16,000 – 49,999). Often mix camp with GHFF

3.2.5.3 Little Red Flying-fox

Table 8 shows the little red flying-fox camps within 50km. They are often mixed camps with BFF and/or GHFF and fluctuate over time. Camps in Gayndah, Hervey Bay and Noosaville seasonally have category 6 (>50,000) camps although these also fluctuate over the years. All three camps are greater than 50km from the Project Area (PLA). Dispersal between camps in the area is unknown and will depend on food availability.

Table 8 provides a summary of the latest LRFF camps/counts (DoEE, NFFMP).

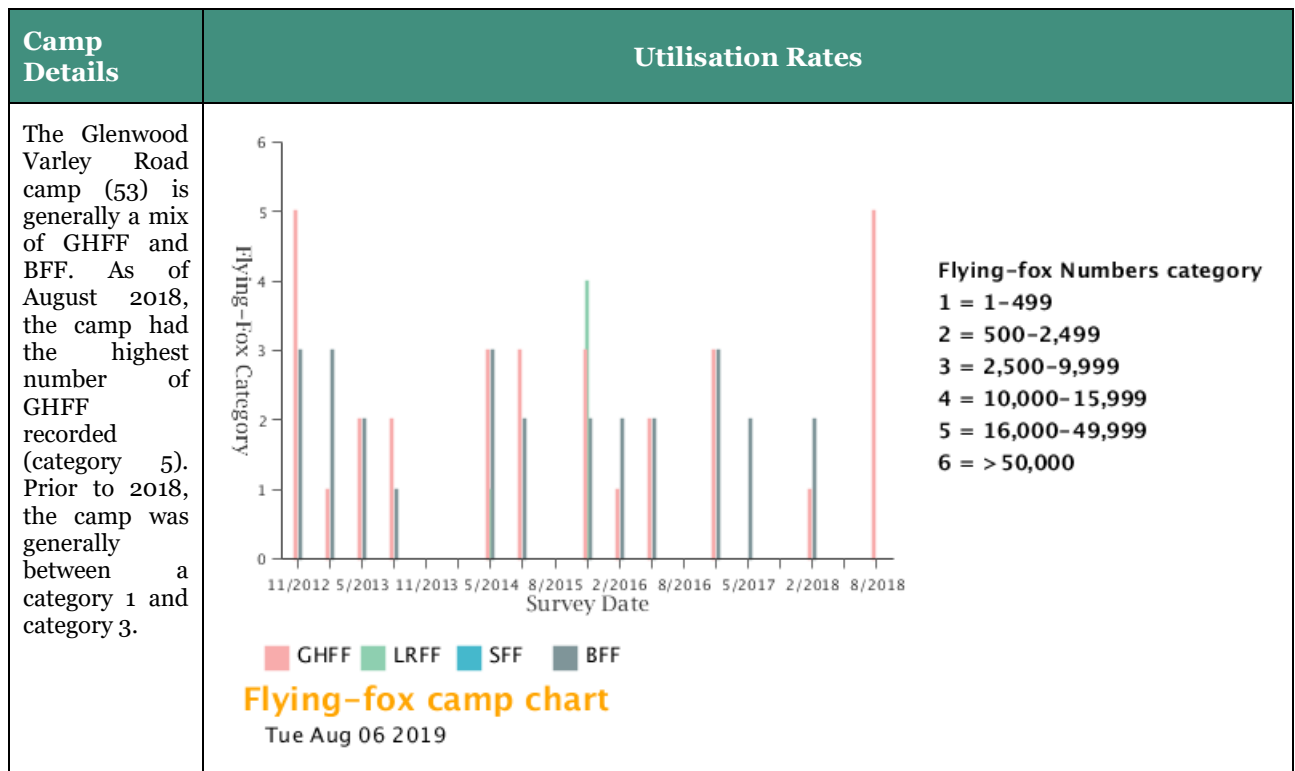
Table 8 Little Red Flying-fox Camps within 50km of the Project Area (PLA)

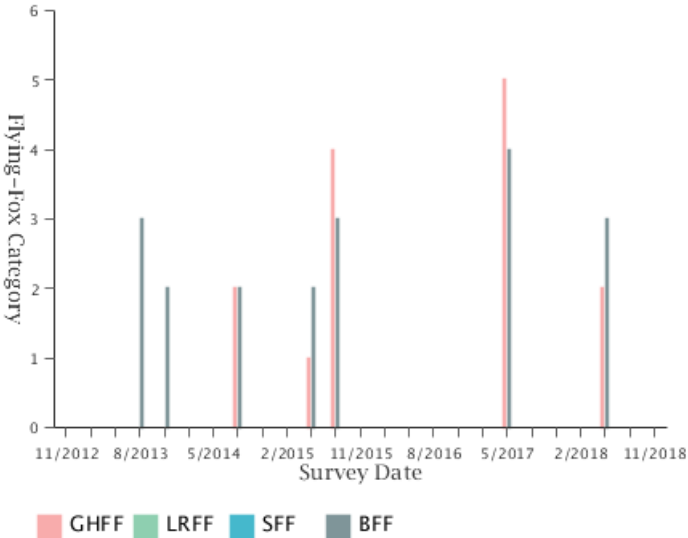
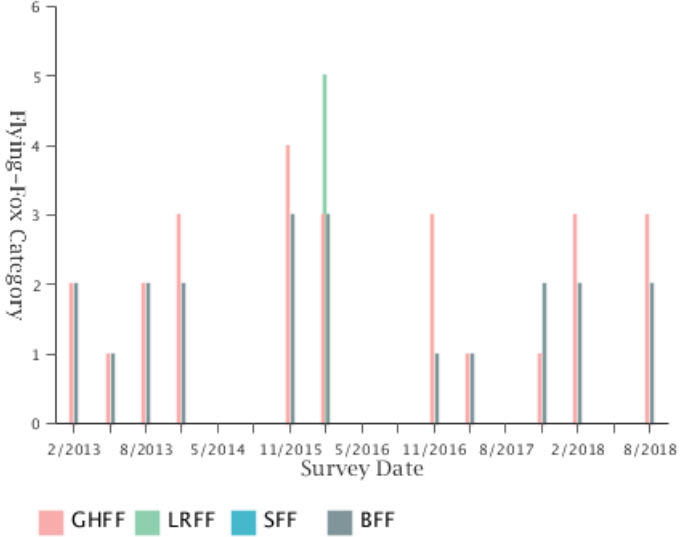
Camp Name/ ID	Distance from turbines (km)		Counts/Category	Date of survey activity	Notes
	Minimum	Maximum			
Glenwood Varley Road (53)	16km	39km	10,000 – 16,000 (category 4)	November 2015	2015 is only active presence between 2012 and 2018
Goomboorian, Anderleigh Road Ginger Creek (55)	9km	49km	16,000 – 49,999 (category 5)	February 2016	No LRFF present in camp since 2016 census.
Gympie (59)	30km	66km	16,000 – 49,999 (category 5)	February 2016	No LRFF present in camp since 2016 census. Was Cat 6 (>50,000) in Feb 2013.
Maryborough, Kent Street (88)	12km	51km	500-2,499 (category 2) 10,000 – 16,000 (category 4)	February 2018 February 2019	No LRFF in Nov 2018 census. Active LRFF presence in camp x4 since

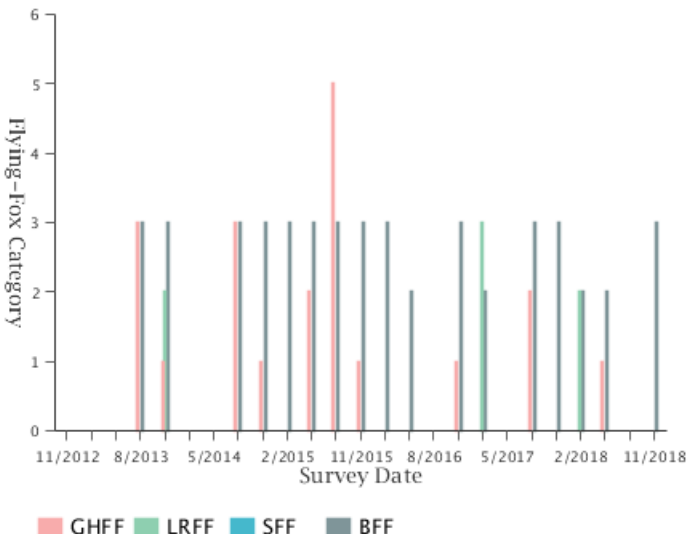
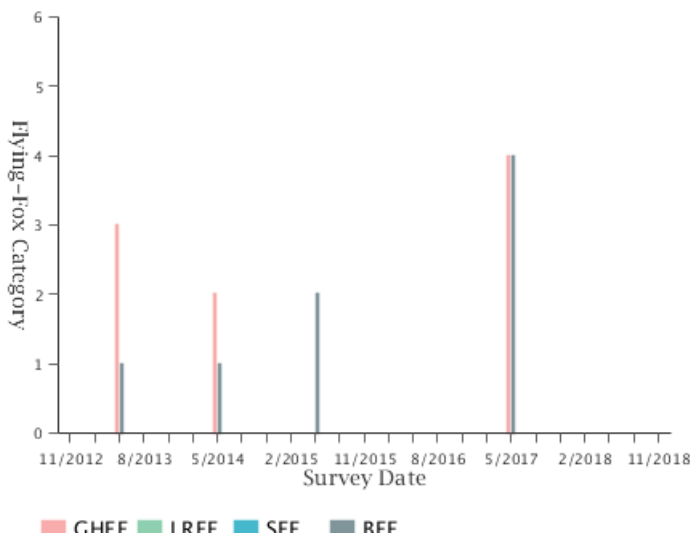
Camp Name/ ID	Distance from turbines (km)	Counts/Category	Date of Survey	Notes
				2012. Cat 3 (Feb 2017) Cat 2 (Nov 2013) Cat 4 (Feb 2019) Was Cat 6 (>50,000) in Feb 2013.

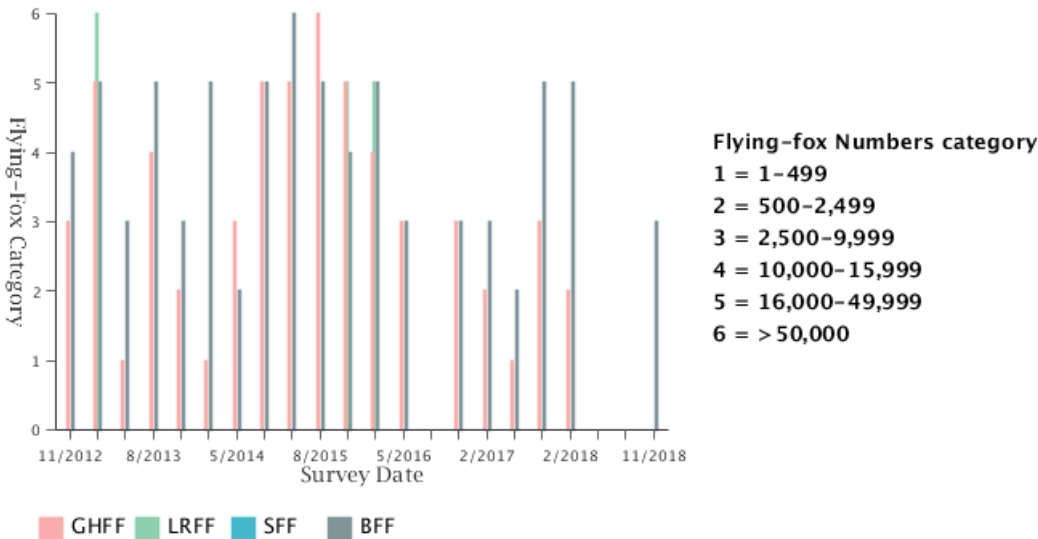
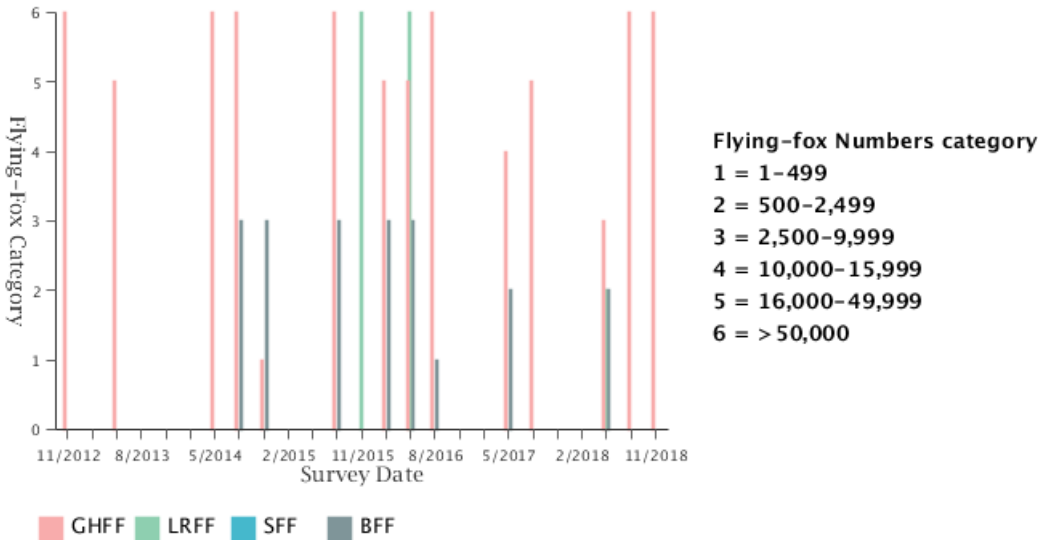
Table 9 shows the camp utilising rates of GHFF, BFF and LRFF since 2012, demonstrating the fluctuation in camp utilisation over time.

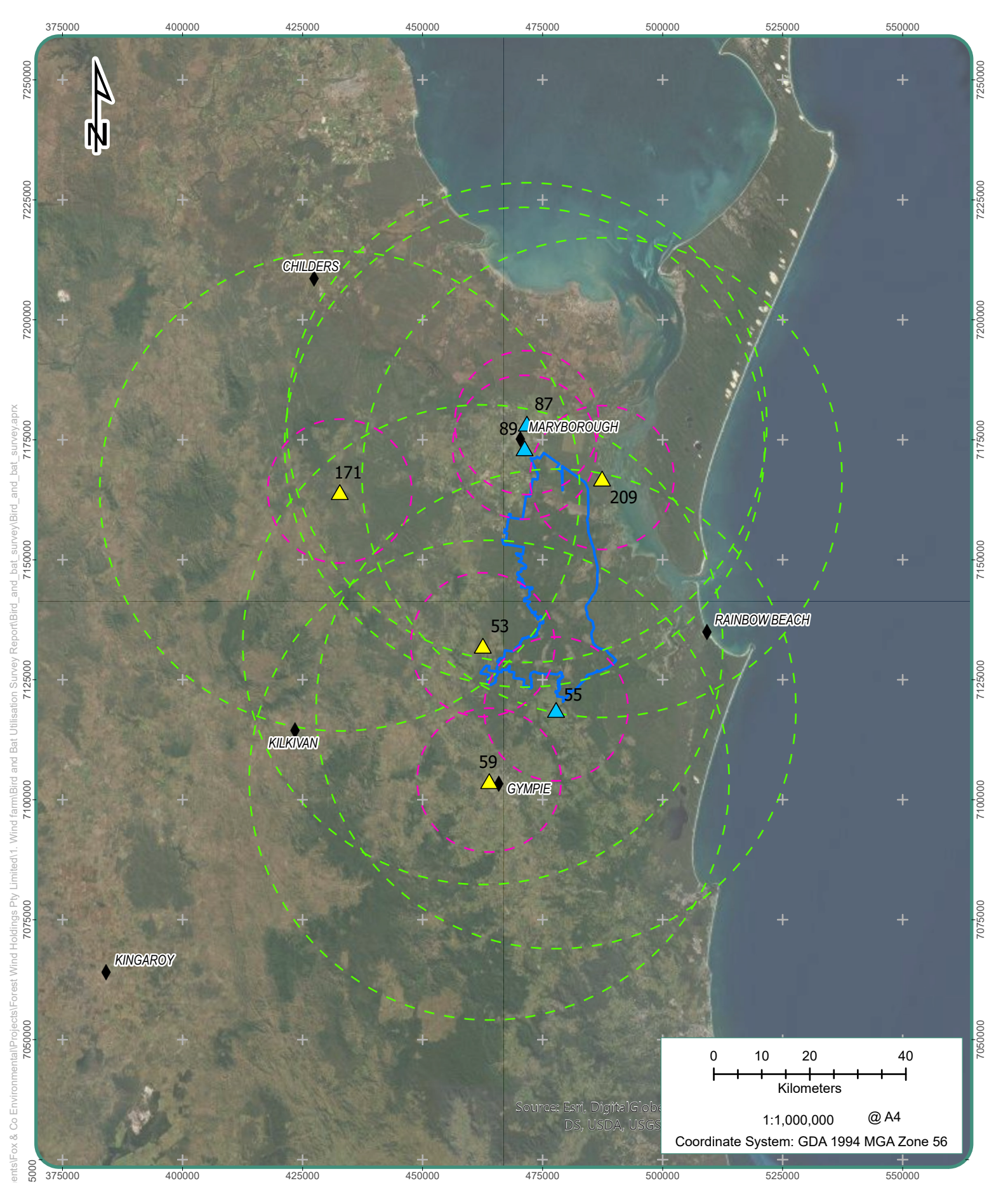
Table 9 Flying-fox Camp Utilisation(2012-2019)



Camp Details	Utilisation Rates
<p>Maaroom (209).</p> <p>A mix of GHFF and BFF.</p> <p>This camp was a category 2 in May 2018.</p> <p>This camp was surveyed by Premise on 7 December 2016 and was inactive. It was active the following year in 2017 as a category 5 camp and is now a category 2 camp.</p>	 <p>Flying-fox camp chart Tue Aug 06 2019</p>
<p>Anderleigh Road (55)</p> <p>A mix of GHFF and BFF.</p> <p>This camp was surveyed by Premise in December 2016 and was an active category 3 camp. It was surveyed again by Premise in October 2018 and was an active category 3 camp.</p> <p>Inactive since bridge upgrades (March 2019) may have caused some disturbance to the camp.</p>	 <p>Flying-fox camp chart Tue Aug 06 2019</p>

Camp Details	Utilisation Rates
<p>Maryborough, Kent Street (88).</p> <p>The camp currently consists of BFF. It was a Category 1 GHFF camp in May 2018 and prior to that fluctuated generally between a Category 1 and Category 3 GHFF camp.</p> <p>It was a Category 5 GHFF in August 2015.</p>	 <p>Flying-fox Numbers category 1 = 1-499 2 = 500-2,499 3 = 2,500-9,999 4 = 10,000-15,999 5 = 16,000-49,999 6 = > 50,000</p> <p>Flying-fox camp chart Wed Aug 07 2019</p>
<p>Maryborough, Albion Road Wetlands (Island Plantation) (87).</p> <p>Category 4 GHFF in May 2017. The camp is a mix of GHFF and BFF at approximately the same ratio in numbers.</p>	 <p>Flying-fox Numbers category 1 = 1-499 2 = 500-2,499 3 = 2,500-9,999 4 = 10,000-15,999 5 = 16,000-49,999 6 = > 50,000</p> <p>Flying-fox camp chart Wed Aug 07 2019</p>

Camp Details	Utilisation Rates
<p>Gympie (53) (Nationally Important GHFF Colony).</p> <p>It was a category 5 and 6 GHFF colony between August 2014 and November 2015.</p> <p>This colony has declined in GHFF numbers since 2016. It is a mix of GHFF and BFF.</p> <p>It has been a category 3 or less since May 2016.</p>	 <p>Flying-fox Numbers category</p> <ul style="list-style-type: none"> 1 = 1-499 2 = 500-2,499 3 = 2,500-9,999 4 = 10,000-15,999 5 = 16,000-49,999 6 = > 50,000 <p>Flying-fox camp chart Wed Aug 07 2019</p>
<p>Woocoo (171) (Nationally Important GHFF Colony)</p> <p>Situated in Woocoo National Park.</p> <p>This camp has generally been a category 6 camp since 2012 (decrease in GHFF numbers in 2017 and back to Category 6 in 2018). It has historically been a mix of GHFF, LRFF and BFF.</p>	 <p>Flying-fox Numbers category</p> <ul style="list-style-type: none"> 1 = 1-499 2 = 500-2,499 3 = 2,500-9,999 4 = 10,000-15,999 5 = 16,000-49,999 6 = > 50,000 <p>Flying-fox camp chart Wed Aug 07 2019</p>



TITLE:
**Grey headed flying-fox
 potential foraging distances**

- LEGEND**
- ▲ Grey headed flying-fox camp
 - ▲ Nationally important flying-fox camp
 - ◆ Populated places
 - Project Area (PLA)
 - Flying-fox camp 15km buffer
 - Flying fox camp 50km buffer

MAP NO: Figure 7

PROJECT: Forest Wind Holdings Pty Ltd -
 Bird & Bat Utilisation Survey



Date: 10/02/2020

Data Source:
 © State of Queensland (Department of Natural Resources, Mines and Energy) 2019.

3.3 Likelihood of Occurrence

Table 10 provides a summary of the likelihood of occurrence of threatened and significant bird and bat species that was prepared for the *Ecological Assessment Report, Forest Wind Project (Fox & Co, 2019)*. The assessment which was informed by desktop assessments and field surveys identified the following bird and bat species as occurring or a moderate to high likelihood of occurrence.

Table 10 Likelihood of Occurrence Summary

Likelihood of Occurrence	Threatened Bats	Threatened Birds	Migratory Birds
Moderate	n/a	Powerful owl (<i>Ninox strenua</i>) Australian painted snipe (<i>Rostratula australis</i> (syn. <i>Rostratula benghalensis</i>)) Ground parrot (<i>Pezoporus wallicus wallicus</i>)	Oriental cuckoo (<i>Cuculus optatus</i>) Great Egret (<i>Ardea modesta</i>) White-bellied sea-eagle (<i>Haliaeetus leucogaster</i>) Black-faced monarch (<i>Monarcha melanopsis</i>) Satin Flycatcher (<i>Myiagra cyanoleuca</i>) Rufous Fantail (<i>Rhipidura rufifrons</i>) Magpie Goose (<i>Anseranas semipalmata</i>) Cattle egret (syn. <i>Bubulcus ibis</i>) (<i>Ardea ibis</i>)
High	n/a	n/a	n/a
Known to Occur	Grey-headed flying-fox (<i>Pteropus poliocephalus</i>) (recorded in NSF portion of Study Area)	White-throated Needletail (<i>Hirundapus caudacutus</i>) (also migratory)	Fork-tailed Swift (<i>Apus pacificus</i>) Spectacled Monarch (<i>Monarcha trivirgatus</i> (syn. <i>Symposiarchus trivirgatus</i>)) Rainbow bee-eater (<i>Merops ornatus</i>) Cicadabird (<i>Coracina tenuirostris</i>)

4 POTENTIAL IMPACTS

The wind turbines, meteorological masts (met masts) and operation / constructions compounds are all situated in the exotic pine plantation and avoid remnant vegetation. Access tracks within the Project Area (PLA) also follow existing forestry tracks and avoid remnant vegetation.

The construction and ongoing operation of the Project within the Project Area (PLA) has a low potential to impact on the nature conservation values of the area. The Project Area (PLA) is located within an existing operational exotic pine plantation that retain small areas of fragmented remnant vegetation. The Project (i.e. project infrastructure) within the Project Area (PLA) avoids environmentally sensitive areas (ESA) and Matters of State Environmental Significance (MSES) such as remnant vegetation, essential habitat and watercourses / wetlands. Whilst the Project Area (PLA) is expansive, the disturbance footprint for the Project is quite small.

4.1 Construction Phase

The construction phase of the Forest Wind project will involve construction of the wind turbines and associated infrastructure such as construction and operation compounds, substation and distribution lines.

4.1.1 Fauna

Potential impacts associated with construction that may affect fauna and fauna habitat values of the Project Area (PLA) are detailed below.

- Direct loss of fauna habitat and resources as a result of vegetation clearing
- Loss of connectivity (included, however is considered a ‘general’ construction impact, rather than a specific Project impact).
- Direct mortality impacts to terrestrial fauna.
- Avoidance behaviour from disturbances associated with activities (e.g. impacts associated with light, dust, noise and vibration).
- Introduction of exotic weed and pest species to retained habitats.

The Project infrastructure has been specifically located within exotic pine plantations and therefore the risk of potential direct and indirect impacts on fauna and fauna habitats is considered low and construction activities are not considered to pose a threat to local populations.

4.1.2 Habitat Loss

Vegetation and hollow-bearing trees (HBTs) provide foraging habitat and roosting / nesting habitat for birds and bats. HBTs and most of the flowering vegetation (excluding regrowth and weeds within the exotic pine plantations) are present within the remnant vegetation patches within the Project Area (PLA). Infrastructure will be sited away from remnant vegetation within the Project Area (PLA) to avoid clearing foraging and roosting / nesting habitat. The transmission line towers in the Project Area (PLA) will be located approximately 450m – 650m apart to span areas of remnant vegetation where necessary. Plantation pine and native vegetation regrowth within the pine forests will require clearing for the turbine tower footings and other project construction compounds. These areas, whilst actively managed by slashing and weed management, also provide foraging habitat for bird and bat species, such as foraging microbat species. Less than 1% of the total pine plantation area is proposed to be cleared for the Project.

4.1.3 Loss of Connectivity

Landscape fragmentation and loss of connectivity is not considered significant as the Project Area (PLA) consists largely of exotic pine plantations. Turbines and associated infrastructure are largely located outside of remnant vegetation and existing high value habitat.

The riparian habitats throughout the exotic pine plantations provide the best opportunities for habitat connectivity through the plantation landscape. Clearing within riparian habitats will be avoided, other than minor trimming of vegetation for potential bridge / culvert upgrades on existing tracks/bridges. As such, there will be no loss of connectivity for least concern, MSES and MNES species.

4.1.4 Waterways and Water Quality

Construction has the potential to impact on waterways in the local area. The activities with the highest risk of causing impacts to aquatic ecosystems / water quality include:

- Removal of topsoils from turbine locations and laydown areas and stockpiling of overburden on site resulting in sediment movement through overland flow
- Changes to water quality and quantity
- Storage of chemicals on site (e.g. hydrocarbons, detergents, degreasers, etc) during construction and operations and the movement of these to creeks.

4.2 Operation Phase

4.2.1 Avoidance Behaviour

There is potential for birds to alter their migration pathways or local flight paths to avoid wind farms which may cause displacement, also known as 'barrier effect'. It has the potential to increase energy expenditure which has potential impacts on breeding productivity and survival (visiting migratory birds to the Great Sandy Strait are here for the non-breeding season). The effect depends on several factors including type of bird (flight height and avoidance of turbines), location, layout, operational status of the wind farm, time of day, visibility, wind force and direction, topography. There are currently few (if any) examples of birds being excluded from key areas due to barrier effects, mainly because onshore wind farms are reasonably isolated from each other and suitable availability of unaffected habitat in the area or region (Gove, 2013).

The bird and bat species present occur across a wide variety of landscapes including modified and fragmented landscapes as occurs within the Project Area (PLA). Whilst avoidance behaviour is difficult to predict, any avoidance behaviour displayed by the species present is unlikely to affect local and regional populations.

4.2.2 Collision Events

4.2.2.1 Birds

As per avoidance behavior, collision events with birds are dependent on type of bird (flight height and avoidance of turbines), location, layout, operational status of the wind farm, time of day, visibility, wind strength and direction and topography. Some birds show avoidance when passing through a wind farm and others have typically low flight elevations, which reduces the likelihood of collision (Gove, 2013).

Most birds in the Project Area (PLA) are small passerines and although there have been few studies on the displacement of small passerines, they are generally not considered to be particularly sensitive or vulnerable at a population level to wind farms due to being typically short-lived with high productivity rates (Gove, 2013). A risk assessment of potential consequence of collision has been undertaken for:

- All threatened and/or migratory birds identified in the likelihood of occurrence assessment (Table 11);
- Migratory shorebirds (Table 12); and
- Least concern birds considered at moderate to high risk of collision (Table 13).

The likelihood of occurrence assessment (summarized in Table 10) identified four (4) threatened birds, twelve (12) migratory birds and one (1) conservation significant bat species as either known to occur or having a moderate to high likelihood of occurrence within the Project Area (PLA). A further 19 least concern bird species and up to 15 least concern bat species (as there are potentially three *Nyctophilus* species occurring in the Project Area (PLA)) have also been identified as either

known to occur or having a moderate to high likelihood of occurrence with a potential risk of collision. The risk assessment for collision based impacts has considered the likelihood of occurrence, typical flight behaviour, distribution and biology (such as feeding behaviour). Risk categories are:

- Low Risk: low flight behaviour with the species typically foraging just above the tree canopy and below it.
- Medium Risk: has the potential to fly at RSA height and suitable habitat is present in the Project Area (PLA) or immediately adjacent to it.
- High Risk: known to regularly fly at or above RSA height, aerial insectivore foragers and suitable habitat present on or adjacent to the Project Area (PLA).

4.2.2.1.1 Conservation Significant Birds

Table 11 Conservation Significant Bird Risk Assessment

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Threatened Birds			
Threatened Birds			
White-throated Needletail <i>Hirundapus caudacutus</i> EPBC Act - V, MT, LM NC Act – SLC	Known	<p>Summer migrant (October – April). Occurs in high open spaces above wide range of habitats, such as oceans, ranges and headlands (Morcombe, 2003).</p> <p>The White-throated Needletail is widespread in eastern and south-eastern Australia (Barrett <i>et al.</i> 2003; Blakers <i>et al.</i> 1984; Higgins 1999). In eastern Australia, it is recorded in all coastal regions of Qld and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains (DoE, 2019).</p> <p>There are no published estimates of the extent of occurrence of the White-throated Needletail in Australia, although the species occurs at numerous and widespread sites in eastern Australia (DoE, 2019).</p> <p>In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1m up to more than 1000 m above the ground (DoE, 2019).</p> <p>They often forage in areas of up draughts, such as ridges, cliffs or sand-dunes, or in the smoke of bushfires, or in whirlwinds. They often forage along the edges of low pressure systems, which both lift their food sources and assist with their flight, and it is said that they follow these systems across Australia (DoE, 2019).</p> <p>Surveys demonstrated the occurrence and</p>	High

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Threatened Birds			
		abundance of this species across the Project Area (PLA) is highly variable. The two survey occasions when they were recorded in flocks greater than 100 were on days associated with local bushfires or stormfronts.	
Powerful owl <i>Ninox strenua</i> EPBC Act – not listed NC Act - V	Moderate	Found in open forests and woodlands, as well as along sheltered gullies in wet forests with dense understorey, especially along watercourses. Known to roost in sheltered groves of midstorey trees, or sometimes pine plantations (Curtis <i>et al.</i> 2012) Mainly on the eastern side of the Great Dividing Range (Morcombe, 2003). If present, they are likely to be utilising remnant patches of native vegetation to roost (midstorey) and occasionally foraging in the logged or regenerating areas. They prey mainly on arboreal mammals (not likely in pine plantations), however are also known to prey on flying-foxes and other species such as birds. They are not likely to fly significantly above canopy height and the potential impact to this species is considered to be low.	Low
Ground Parrot <i>Pezoporus wallicus wallicus</i> EPBC Act – Not Listed NC Act - V	Moderate	The Ground Parrot (eastern) is terrestrial. It occurs mostly in coastal heathland or sedgeland with very dense cover and a high density of the parrot's preferred food plants. In south-east Queensland, it occurs mostly in closed, subtropical graminoid heathlands (consisting of grass-trees, with a high diversity of sedges, rushes and low shrubs), either moist or dry. Within heathlands, dry habitats are used from mid-autumn to late spring, and wet habitats at other times. It is sometimes found in open <i>Banksia</i> woodlands with a heath understorey, in closed fernland around shallow creeks on plains, or in sedges at swamp margins (DoE, 2019) Infrequent collision based on low numbers moving through the study area and low flight behaviour.	Low
Australian painted snipe	Moderate	Variety of habitats but generally requires presence of water. Inhabits shallow terrestrial freshwater wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or	Low

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Threatened Birds			
<p><i>Rostratula australis</i></p> <p>(syn. <i>Rostratula benghalensis</i>)</p> <p>EPBC Act – E, LM, MW</p> <p>NC Act - V</p>		<p>waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains (Department of the Environment, 2014f).</p> <p>Usually remains among the cover of wetland vegetation while foraging. It feeds at night, probing the soft mud with its long bill as it walks, pecking at seeds and taking small invertebrates (Birdlife Australia).</p> <p>Low risk of collision due to specific habitat preferences and low numbers moving through study area.</p>	
Migratory Birds and Listed Marine			
<p>Fork-tailed Swift</p> <p><i>Apus pacificus</i></p> <p>EPBC – LM, MM</p> <p>NC Act - SLC</p>	Known	<p>Summer migrant (October – April). Occurs in low to very high airspace over variety of habitats including rainforest and semi-arid areas. Known to be most active in front of summer storm fronts (Morcombe, 2003).</p> <p>The Fork-tailed Swift is almost exclusively aerial, flying from less than 1m to at least 300m above ground and probably much higher (DoE, 2019). They forage along the edge of low pressure systems and for that reason are considered a precursor to unsettled weather. The low pressure system helps to lift prey, such as insects, from the ground and assists in flight (DoE, 2019).</p> <p>They are widespread but scattered in coastal areas from 20°S, south to Brisbane and in much of the south south-eastern region. They are more widespread west of the Great Dividing Range, and are commonly found west of the line joining Chinchilla and Hughenden (DoE, 2019).</p> <p>Surveys demonstrated the occurrence and abundance of this species across the Project Area (PLA) is highly variable. FTS were recorded in their highest numbers (up to 51 individuals) on 29 November 2018 which was associated with severe local bushfires (same days as the WTN).</p>	High
<p>Rainbow bee-eater</p>	Known	<p>Summer migrant (September – April) although in northern Australia they remain and breed. In recent years, they have been observed throughout the year on the Sunshine Coast (pers obs, Paul</p>	Moderate

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Threatened Birds			
<p><i>Merops ornatus</i></p> <p>EPBC Act – LM NC Act - LC</p>		<p>Fox). Occurs in open woodlands, semi-arid scrub, grasslands, clearing in heavier forests, farmlands and coastal areas. Avoids heavy forests due to hindrance to feeding (i.e. catching insects) (Morcombe, 2003).</p> <p>All birds observed in the Project Area (PLA) were observed flying and feeding less than 30m above the ground. Infrequent collision based on observed feeding behaviour within Project Area (PLA).</p> <p>Although observed within Project Area (PLA) below RSA, they are aerial insectivores and therefore considered to potentially fly within RSA.</p>	
<p>Cicadabird</p> <p><i>Coracina tenuirostris</i></p> <p>EPBC Act – LM NC Act - LC</p>	Known	<p>Occurs in the foliage canopy of diverse forests and woodlands as well as mangroves and paperbark swamps. A migratory visitor to south eastern Australia (Morcombe, 2003).</p> <p>Infrequent collision based on low numbers moving through the study area and low flight behaviour.</p>	Low
<p>Magpie Goose</p> <p><i>Anseranas semipalmata</i></p> <p>EPBC Act – LM NC Act - LC</p>	Moderate	<p>The species may fly at RSA height during movement inland between the coast and inland wetland habitats. None observed during surveys. Infrequent collision based on low numbers moving through the study area.</p>	Low
<p>Great Egret</p> <p><i>Ardea modesta</i></p> <p>EPBC Act – LM, MW NC Act - LC</p>	Moderate	<p>Widespread in Australia. Recorded in a wide range of wetland habitats including flooded pastures, dams, estuarine mudflats, mangroves and reefs and usually frequents shallow water (Department of the Environment, 2015b; Morcombe, 2003).</p> <p>No records from the Project Area (PLA) or suitable habitat within the Project Area (PLA).</p> <p>The species may fly at RSA height during movement inland between the coast and inland wetland habitats. None observed</p>	Low

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Threatened Birds			
		during surveys. Infrequent collision based on low numbers moving through the study area.	
Cattle egret <i>Ardea ibis</i> (syn. <i>Bubulcus ibis</i>) <i>EPBC Act – LM, MW</i> <i>NC Act - LC</i>	Moderate	Occurs in moist pastures with tall grass, shallow open wetlands and margins and also mudflats (Morcombe, 2003). The species may fly at RSA height during movement inland between the coast and inland wetland habitats. None observed during surveys. Infrequent collision based on low numbers moving through the study area.	Low
Oriental cuckoo <i>Cuculus optatus</i> <i>EPBC Act – MT</i> <i>NC Act - LC</i>	Moderate	Vegetated habitats such as monsoon rainforest, wet sclerophyll forest, open woodlands and appears quite often along edges of forests, or ecotones between forest types. This cuckoo feeds arboreally, foraging for invertebrates on loose bark on the trunks and branches of trees, and among the foliage, including in mistletoes. It will forage from the ground, but requires shrubs or trees from which it sallies and returns to consume prey items. Infrequent collision based on low numbers moving through the study area and low flight behaviour.	Low
White-bellied sea-eagle <i>Haliaeetus leucogaster</i> <i>EPBC Act – LM</i> <i>NC Act - LC</i>	Moderate	Occurs in predominantly coastal areas although also occurs far inland on large pools of rivers. Mostly over islands, reefs, headlands, beaches and estuaries. Known to occur on seasonally inundated swamps, lagoons and floodplains (Morcombe, 2003). It is considered to be a common species throughout much of its range, and has an estimated global population of more than 10,000 individuals (including breeding and non-breeding adults, and immature birds) (DoE, 2019). The White-bellied Sea-Eagle generally forages over large expanses of open water; this is particularly true of birds that occur in coastal environments close to the sea-shore, where they forage over in-shore waters. However, the White-bellied Sea-Eagle will also forage over open terrestrial	Low

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Threatened Birds			
		<p>habitats (such as grasslands) (DoE, 2019).</p> <p>Breeding adult birds are generally sedentary, although they forage over large areas and are capable of undertaking long-distance movements. Home ranges occupied by the White-bellied Sea-Eagle can be up to 100km² (DoE, 2019).</p> <p>Although not observed during surveys, given they are known along the Great Sandy Strait and Fraser Island and have a large home range, they may possibly fly over the site at RSA height.</p> <p>Infrequent collision due to low numbers moving through study area and preferred foraging habitat along the coastline.</p>	
<p>Black-faced monarch</p> <p><i>Monarcha melanopsis</i></p> <p>EPBC Act – LM, MT</p> <p>NC Act - SLC</p>	Moderate	<p>Found in rainforests, eucalypt woodlands, coastal scrub and damp gullies. It may be found in more open woodland when migrating into the south-east during summer (Morcombe, 2003).</p> <p>No previous records although suitable habitat maybe in the adjacent National Parks (Poona NP and Great Sandy NP).</p> <p>Infrequent collision based on low numbers moving through the study area and low flight behaviour.</p>	Low
<p>Spectacled Monarch</p> <p><i>Monarcha trivirgatus (syn. Symposiarchus trivirgatus)</i></p> <p>EPBC Act – LM, MT</p> <p>NC Act - SLC</p>	Moderate	<p>Resident of NE Qld and migrates to SE Qld. Found mainly in rainforests but also can be found in mangroves, swamps and watercourse thickets (Morcombe, 2003).</p> <p>Identified during surveys (Fox & Co, 2020) within vine forest along Tinana Creek near Raintree Bridge. Two (2) individuals observed in understorey.</p> <p>Potential suitable habitat in the adjacent National Parks (Poona NP and Great Sandy NP).</p> <p>Infrequent collision based on low numbers moving through the study area and low flight behaviour.</p>	Low
<p>Satin Flycatcher</p> <p><i>Myiagra cyanoleuca</i></p>	Moderate	<p>Satin Flycatchers are eucalypt forest and woodland inhabitants. They are particularly common in tall wet sclerophyll forest, often in gullies or along water courses. In woodlands they prefer open, grassy woodland. The diversity of occupied habitats expands during migration, with</p>	Low

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Threatened Birds			
<i>EPBC Act – MT</i> <i>NC Act - SLC</i>		the species recorded in most wooded habitats (Draft Referral Guideline for 14 Birds listed as Migratory Species under the EPBC Act, 2015). No previous records although suitable habitat maybe in the adjacent National Parks (Poona NP and Great Sandy NP). Infrequent collision based on low numbers moving through the study area and low flight behaviour.	
Rufous Fantail <i>Rhipidura rufifrons</i> <i>EPBC Act – LM, MT</i> <i>NC Act - SLC</i>	Moderate	Found in rainforest, dense wet eucalypt and monsoon forest, swamps, riverside vegetation. Found in open country on migration (Morcombe, 2003). Infrequent collision based on low numbers moving through the study area and low flight behaviour.	Low

4.2.2.1.2 Migratory Shorebirds

Migratory shorebirds were assessed for their susceptibility to collision based impacts considering their arrival and departure from the Great Sandy Strait over the summer months. The risk of impact is low or unlikely and is provided in Table 12 below.

The Great Sandy Strait is considered an internationally important site for seven (7) migratory species (Bamford *et al.*, 2008). The below table provides an assessment of those seven (7) species, although all migratory species either known or predicted to occur were also assessed and are provided in the likelihood of occurrence table in the *Ecological Assessment Report* (Fox & Co, 2019).

There have been several studies on the climbing and flight speeds of coastal shorebirds when departing on long-distance migratory flights (Piersma *et al.* 1990 and 1997). Based on the studies, it is understood shorebirds depart in an elongated, shallow “V” formation, termed an “echelon” in flocks of between 5 and 250 birds, with occasional observations of larger flocks. They ascend rapidly and steeply, often resulting in being lost from sight while still ascending. Estimates of climb rate vary, however larger / heavier species of shorebirds are slower to ascend (Piersma *et al.* 1990, 1997). Observations of flight altitude using weather radar show that during migration, shorebirds fly at between 0.5 and 6km (Piersma *et al.* 1990). However it is likely to be higher, as studies using radar from oceanic islands when the birds are in a long-flight, level pattern have reporting heights ranging from 2.6km to 6km above sea-level.

Given the absence of migratory shorebird records within and/or flying over the Project Area (PLA) during known summer migratory periods over three summer seasons, the known steep and rapid ascent on departure and distance of a minimum of 4km from the Great Sandy Strait, it is considered:

- migratory shorebirds present in the Great Sandy Strait during the summer months possibly arrive or depart in a north-south direction along the coast, avoiding the Project

Area (PLA).

- should migratory shorebirds pass through the Project Area (PLA), due to the rapid and steep rate of departure and distance of at least 4km from the Great Sandy Strait, it is unlikely shorebirds would be flying at heights low enough to be impacted by the RSA of the turbines.
- Shorebirds have specific habitat preferences and are unlikely to fly into the site.

Table 12 Migratory Shorebird Risk Assessment

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Terek sandpiper (<i>Xenus cinereus</i>)	<p>Unlikely in the Project Area (PLA).</p> <p>Known to occur in the Great Sandy Strait as a summer migrant.</p>	<p>Forages mostly in the open, on soft wet intertidal mudflats or in sheltered estuaries, embayments, harbours or lagoons. The species has also been recorded on islets, mudbanks, sandbanks and spits, and near mangroves and occasionally in samphire (<i>Halosarcia</i> spp.). Birds are seldom near the edge of water, however, birds may wade into the water (Department of the Environment, 2016e).</p> <p>There appear to be two waves of migration down the eastern coast: one in August or September and one in November (DoE, 2019).</p> <p>Widespread in coastal Qld, from south-east of the Gulf of Carpentaria, north to Torres Strait and along the eastern coast to south-east Australia.</p> <p>Migratory shorebird of the East Asian – Australasian Flyway (EAA). The Great Sandy Strait is an important non-breeding site in Australia (Bamford <i>et al.</i>, 2008).</p> <p>Low risk of collision due to specific habitat preferences that restrict species distribution to intertidal areas. No habitat immediately west of Project Area (PLA) so short flights unlikely to occur.</p>	Low
Grey-tailed tattler (<i>Tringa brevipes</i>)	<p>Unlikely in the Project Area (PLA).</p> <p>Known to occur in the Great Sandy Strait as a summer migrant.</p>	<p>Within Australia, the Grey-tailed Tattler has a primarily northern coastal distribution and is found in most coastal regions. In Qld it is found along the entire coast, with small numbers located in the Gulf of Carpentaria.</p> <p>The Grey-tailed Tattler is often found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. It</p>	Low

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
		<p>can also be found at intertidal rocky, coral or stony reefs as well as platforms and islets that are exposed at low tide. It has been found around shores of rock, shingle, gravel or shells and also on intertidal mudflats in embayments, estuaries and coastal lagoons, especially fringed with mangroves (DoE, 2019).</p> <p>Migratory shorebird of the EAA. The Great Sandy Strait is an important non-breeding site in Australia (Bamford <i>et al.</i>, 2008).</p> <p>Low risk of collision due to specific habitat preferences that restrict species distribution to intertidal areas. No habitat immediately west of Project Area (PLA) so short flights unlikely to occur.</p>	
<p>Common greenshank (<i>Tringa nebularia</i>)</p>	<p>Unlikely in the Project Area (PLA).</p> <p>Known to occur in the Great Sandy Strait as a summer migrant.</p>	<p>It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms (Department of the Environment, 2015s).</p> <p>Migratory shorebird of the EAA. The Great Sandy Strait is an important non-breeding site in Australia (Bamford <i>et al.</i>, 2008).</p> <p>Low risk of collision due to specific habitat preferences that restrict species distribution to intertidal areas. No habitat immediately west of Project Area (PLA) so short flights unlikely to occur.</p>	<p>Low</p>
<p>Bar-tailed godwit (<i>Limosa lapponica baueri</i> and <i>Limosa lapponica menzbieri</i>)</p>	<p>Unlikely in the Project Area (PLA).</p> <p>Known to occur in the Great Sandy Strait as a summer migrant.</p>	<p>Inhabits mainly in coastal areas such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays, around beds of seagrass, saltmarsh, coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. Rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips (DoE, 2019; Morcombe, 2003).</p> <p>Breeds in eastern Russia and Alaska (Migratory Shorebirds of the EAA</p>	<p>Low</p>

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
		<p>Flyway).</p> <p>Migratory shorebird of the EAA. Seven important non-breeding sites in Australia; one being the Great Sandy Strait.</p> <p>Low risk of collision due to specific habitat preferences that restrict species distribution to intertidal areas. No habitat immediately west of Project Area (PLA) so short flights unlikely to occur.</p>	
<p>Lesser sand plover (<i>Charadrius mongolus</i>)</p>	<p>Unlikely in the Project Area (PLA).</p> <p>Known to occur in the Great Sandy Strait as a summer migrant.</p>	<p>Within Australia, the lesser sand plover is widespread in coastal regions and has been recorded in all states. It mainly occurs in northern and eastern Australia, in south-eastern parts of the Gulf of Carpentaria, western Cape York Peninsula, islands in Torres Strait, and along the entire east coast (DoE Conservation Advice, 2016). It is most numerous in Queensland and New South Wales. Inhabits mud and sandflats in sheltered bays, estuaries, harbours, and occasionally rocky outcrops, sandy beaches and coral reefs. Roosting occurs near foraging areas (DoE, 2019).</p> <p>Migratory shorebird of the EAA. Seven important non-breeding sites in Australia; one being the Great Sandy Strait.</p> <p>Numbers begin to increase at various sites in northern Australia between February and April (mostly March to April), suggesting that birds move along the eastern and northern coasts before they leave on their northern migration in April (DoE, 2019).</p> <p>Low risk of collision due to specific habitat preferences that restrict species distribution to intertidal areas. No habitat immediately west of Project Area (PLA) so short flights unlikely to occur.</p>	<p>Low</p>
<p>Whimbrel (<i>Numenius phaeopus</i>)</p>	<p>Unlikely in the Project Area (PLA).</p> <p>Known to occur in the Great Sandy Strait as a summer</p>	<p>Often found in mudflats of estuaries, particularly those with mangroves. Occasionally found on sandy or rocky beaches, on coral or rocky islets, or on intertidal reefs and platforms (DoE, 2019).</p> <p>When they arrive, they move south along</p>	<p>Low</p>

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
	migrant.	<p>the east coast. Influxes (which are mostly temporary) occur at sites along the east coast during migration in August (north of 20°S), and in September-October (south of 20°S) (DoE, 2019).</p> <p>When they depart Australia, Whimbrels begin migrating from February onwards (Higgins & Davies 1996). Influxes occur at most sites in Qld from early March to early April. The birds leave the north and north-east coasts by late April (DoE, 2019).</p> <p>Migratory shorebird of the EAA. Non-breeding period in Australia (Bamford <i>et al.</i>, 2008).</p> <p>Low risk of collision due to specific habitat preferences that restrict species distribution to intertidal areas. No habitat immediately west of Project Area (PLA) so short flights unlikely to occur.</p>	
Far eastern curlew (<i>Numenius madagascariensis</i>)	<p>Unlikely in the Project Area (PLA).</p> <p>Known to occur in the Great Sandy Strait as a summer migrant.</p>	<p>Associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sand flats (Morcombe, 2003).</p> <p>Migratory shorebird of the EAA. Non-breeding period in Australia (Bamford <i>et al.</i>, 2008).</p> <p>Low risk of collision due to specific habitat preferences that restrict species distribution to intertidal areas. No habitat immediately west of Project Area (PLA) so short flights unlikely to occur.</p>	Low

4.2.2.1.3 Least Concern Bird Species

Least concern bird species either recorded during site surveys or considered likely to occur were assessed on their susceptibility of collision. Table 13 provides least concern species identified as at risk of collision. Whilst their risk of collision is considered moderate to high, given their often wide distribution across Australia and stable populations (least concern), impacts to their populations are considered low.

Table 13 Least Concern Bird Species Risk Assessment

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Passerine Species			

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Welcome swallow <i>Hirundo neoxena</i> EPBC Act – LM NC Act - LC	Occurs	<p>Welcome Swallows are widespread in Australia and occupy a wide variety of habitats.</p> <p>They were observed within the Project Area (PLA) flying below the RSA, although they are likely to fly within the RSA as they are known to feed with swifts, woodswallows and martins (Simpson & Day, 2004).</p> <p>They are aerial insectivores and are considered at risk of collision with wind turbines</p>	High
Torresian crow <i>Corvus orru</i>	Occurs	<p>The Torresian crow has an extensive distribution across Australia. Occurs in open forest, woodland, farms, grassland and urban areas.</p> <p>The Torresian crow, similarly to many corvids, is an opportunistic species and has adapted to a broad range of habitats. The population size in Australia is increasing, possibly due to urban and agricultural expansion.</p> <p>One of the reasons the Torresian crow is able to take advantage of increased urbanisation is its diet; a significant proportion of the diet of the species consists of carrion. Torresian crows are large and aggressive birds, with females displaying the more aggressive behaviour and dominating most other species. They have been observed to attack larger birds of prey, particularly wedge-tailed eagles and most owl species in defense of their nest or territory (ALA, 2020).</p> <p>Although not observed flying within the RSA within the Project Area (PLA), they are considered at risk of collision due to their aggressive flight behavior and penchant for carrion</p>	High
Australian magpie <i>Gymnorhina tibicen</i>	Occurs	<p>Australian magpies are common throughout Australia and are found wherever there is a combination of trees and adjacent open areas. They live in groups of up to 24 birds in territories that are defending all year around by group members.</p> <p>Collision mortalities have been recorded at Ararat windfarm (BL& A, 2018). They were recorded below the RSA height during BUS surveys however have the potential to fly at RSA height.</p>	High

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Tree martin <i>Petrochelidon nigricans</i> EPBC – LM (as <i>Hirundo nigricans</i>) NC Act - LC	Occurs	<p>Tree martins occur throughout Australia and occur in the airspace above almost every terrestrial habitat in Australia, ranging from grassy plains to forests, wetlands and built-up areas (Birdlife, 2020).</p> <p>Tree Martins are aerial insectivores and fly erratically in pursuit of flying insects. They often feed above the canopy and occasionally below the canopy. Their flight is agile and erratic.</p> <p>They are considered at risk of collision due to their flight behavior.</p>	High
Non-passerine Species			
Channel-billed cuckoo <i>Scythrops novaehollandiae</i> EPBC Act – LM NC Act - LC	Occurs	<p>The Channel-billed Cuckoo migrates to northern and eastern Australia from New Guinea and Indonesia between August and October each year. The birds leave Australia in February or March (Australian Museum, 2020).</p> <p>Channel-billed Cuckoo is found in tall open forests, usually where host species occur. They feed on native figs and native fruits, though some seeds, insects and baby birds are also taken.</p> <p>Observed flying over the Project Area (PLA) within the RSA and therefore are at risk of collision.</p>	High
Sulphur-crested cockatoo <i>Cacatua galerita</i> EPBC – not listed NC Act - LC	Occurs	<p>Occupies a variety of habitat types and flocks feed on the ground (Simpson & Day, 2004). The Sulphur-crested cockatoo range extends throughout northern and eastern Australia and Tasmania. A population has established in Western Australia around Perth.</p> <p>Eggs are laid in a suitable hollow and both birds incubate and care for the chicks. Chicks remain with parents all year round and family groups stay together indefinitely (Australian Museum, 2020).</p> <p>Observed in the Project Area (PLA) although not within the RSA height. This species is considered at risk of collision, although considered moderate due to feeding behaviour and general flight behaviour.</p>	Moderate
Yellow-tailed black-cockatoo	Occurs	<p>Yellow-tailed black-cockatoo inhabits a variety of habitat types, however favours</p>	Moderate

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
<p><i>Calyptorhynchus funereus</i></p> <p>EPBC Act – not listed NC Act - LC</p>		<p>eucalypt woodland and pine plantations. Occurs in small to large flocks (Australian Museum, 2020).</p> <p>Yellow-tailed black-cockatoo is found in south-eastern Australia, from Eyre Peninsula, South Australia to south and central eastern Queensland.</p> <p>They feed on wood-boring larvae and seeds of native and introduced trees and ground plants. They are known to tear open pine cones to extract the seeds. Both sexes construct the nest, which is a large tree hollow, lined with wood chips. The female incubates the eggs, while the male supplies her with food. Usually only one chick survives, and this will stay in the care of both parents for approximately 6 months.</p> <p>Observed within Project Area (PLA). Due to their common occurrence in pine plantation forests in south-east Queensland they are considered at risk of collision, although considered moderate due to observed and known flight behaviour.</p>	
Raptors			
<p>Whistling kite</p> <p><i>Haliastur sphenurus</i></p>	Occurs	<p>Whistling kites are found throughout Australia. They are known to occur in open pastures, grasslands and lightly wooded areas and are typically found near water.</p> <p>They feed on small mammals, birds, fish, reptiles, crustaceans and insects. They will also feed on carrion. They often take prey from the ground although are also known to feed on insects from the air.</p> <p>Whistling kites were observed on the Project Area (PLA) within the RSA height and are at risk of collision.</p>	High
<p>Spotted harrier</p> <p><i>Circus assimilis</i></p>	Occurs	<p>Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast. They occur in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands (NSW Office of Environment and Heritage, 2020).</p> <p>They prey on terrestrial mammals, birds,</p>	Low - Moderate

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
		<p>reptiles, insects and occasionally carrion (Morcombe, 2011).</p> <p>Although is known to soar high it is more commonly seen hunting low over vegetation. This species was recorded within the Project Area (PLA) however observed below the RSA height.</p> <p>Based on its flight behavior it is considered at low – moderate risk of collision.</p>	
<p>Black-shouldered kite</p> <p><i>Elanus axillaris</i></p>	<p>Occurs</p>	<p>Black-shouldered kites are common throughout Australia. They usually inhabit grasslands and open habitats.</p> <p>They feed mainly on rodents, particularly the introduced house mouse. They prefer to hunt during the day, particularly early morning and late afternoon, often hovering with their wings held upright in a V-shape, before dropping down and grabbing prey with their talons (Birdlife Australia, 2020).</p> <p>Although is known to soar high it is more commonly seen hunting low over vegetation. This species was recorded within the Project Area (PLA) however observed below the RSA height.</p> <p>Based on its flight behavior it is considered at low – moderate risk of collision.</p>	<p>Low - Moderate</p>
<p>Brown falcon</p> <p><i>Falco berigora</i></p>	<p>Occurs</p>	<p>Brown falcons are common throughout Australia. They are often observed hovering or flying back and forth over open habitats, especially grasslands and low shrublands, where they search for prey. They are opportunistic raptors, catching and eating mammals and birds, snakes and insects (Birdlife Australia, 2020).</p> <p>Observed within the Project Area (PLA) however below the RSA height during surveys. They are likely to occur within the RSA height and are therefore susceptible to collision.</p>	<p>High</p>
<p>Australian hobby</p> <p><i>Falco longipennis</i></p>	<p>Occurs</p>	<p>They are common throughout Australia. Often seen dashing past, either low to the ground or just above the treetops, the Australian Hobby is often seen hunting in vegetated urban areas, as well as in almost any lightly timbered country. Their flight varies from swift and direct with flickering wing-beats to gliding and soaring, and</p>	<p>High</p>

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
		<p>they regularly catch their food—small birds and insects—in the air. They sometimes eat it on the wing too, or land on a high perch (Birdlife Australia, 2020).</p> <p>Observed within the Project Area (PLA) however below the RSA height during surveys. They are likely to occur within the RSA height and are therefore susceptible to collision.</p>	
Peregrine falcon <i>Falco peregrinus macropus</i>	Occurs	<p>Peregrine falcons occur throughout Australia. Peregrine Falcons mate for life and pairs defend a home range of about 20-30km². Peregrine Falcons are the fastest animal in the world, with stoops recorded at speeds faster than 300km/hr. Hunting is mainly done during the day, including around dawn and dusk. Feeding primarily on small-medium sized birds, but occasionally taking insects, such as moths, cicadas and locusts (Birdlife Australia, 2020).</p> <p>Observed within the Project Area (PLA) however below the RSA height during surveys. They are likely to occur within the RSA height and are therefore susceptible to collision.</p>	High
Wedge tailed eagle <i>Aquila audax</i>	Likely to occur	<p>Wedge-tailed Eagle (WTE) is Australia's largest bird of prey and is found throughout Australia. They are known to soar up to altitudes of 2000m.</p> <p>Wedge-tailed eagles eat live prey and carrion. Wedge-tailed eagles occupy an area of about 30 to 35km². They spend most of their time either perched in trees or in the air, circling throughout their territory with a pattern of arcs and dives to signal ownership. Eagles usually nest and perch in high trees or other structures.</p> <p>Wedge-tailed eagles have been known to collide with wind farms in Tasmania (Hull <i>et al.</i> 2013) and the Ararat wind farm in Victoria (BL & A, 2018). Carcass monitoring on the Ararat windfarm reported most wedge-tailed eagles impacted by collision were young birds that would have recently fledged and left their nests. Continued monitoring on and around the Ararat wind farm has reported WTE flying in and around the wind farm without collisions suggesting the collisions were from young WTE entering the wind farm area from outside in the search of new territory (BL & A, 2018). It is assumed WTE are at risk of collision</p>	High

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
		mainly due to their soaring habits and uplifting on air currents.	
Waterbird Species			
Australian pelican <i>Pelecanus conspicillatus</i>	Likely to occur	<p>Australian pelicans live very close to water in coastal inlets, shorelines, lakes, swamps and rivers of the interior. They will reside in almost any area that supports a large abundance of fish, however their major habitat is the marine intertidal zone including sandy shoreline, sandbars and spits (Poole, 2011).</p> <p>They are strong, slow fliers that often glide on thermals to conserve energy. During flight they pull their head inward towards their body and rest it on their shoulders. These birds will travel very long distances in order to find food, and have been known to remain airborne for 24 hours (Poole, 2011). Australian pelicans are highly social, diurnal birds that fly together in groups which can be very large at times (Poole, 2011).</p> <p>Australian pelicans are of least concern because they have a very large range, their population trend is fluctuating, and their population size is very large (between 100,000 and 1,000,000 individuals) (Poole, 2011).</p> <p>Pelicans were not observed during BUS surveys however due to the available food resources in the Great Sandy Strait, their ability to soar on thermals and travel large distances, they are considered likely to pass over the Project Area (PLA) and therefore are at risk of collision.</p>	High
Australian white ibis <i>Threskiornis Molucca</i> straw-necked ibis <i>Threskiornis spinicollis</i>	Likely to occur	<p>Both ibis species are found throughout Australia and have previously been recorded on the Project Area (PLA) (Wildnet). However they were not recorded during BUS assessments. They mainly feed on aquatic invertebrates, insects, molluscs, fish and snakes in their natural habitat. Australian white ibis also frequently scavenge in land-fill sites and human recreation areas (ALA, 2020).</p> <p>They are a least concern waterbirds and are known to soar at heights within and above the RSA and therefore are considered at risk of collision.</p>	High
White-necked heron	Occurs	White-necked Heron is widespread throughout most of Australia except desert	Moderate

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
<i>Ardea pacifica</i>		<p>areas of Western Australia and South Australia.</p> <p>Although White-necked Herons are sometimes seen in tidal areas, most are found in shallow fresh waters, including farm dams, flooded pastures, claypans, and even roadside ditches.</p> <p>They were observed on the Project Area (PLA) feeding in a roadside drain. They are capable of soaring within the RSA height and therefore susceptible to collision.</p>	

4.2.2.1.4 Consequence of Collision (Birds)

The above assessment identified the following:

- White-throated Needletail (*Hirundapus caudacutus*) – High risk of collision
- Fork-tailed Swift (*Apus pacificus*) - High risk of collision
- Rainbow bee-eater (*Merops ornatus*) - Moderate risk of collision
- Powerful owl (*Ninox strenua*) – Low risk of collision
- Glossy Black Cockatoo *Calyptorhynchus lathami lathami* (eastern subspecies) – Low risk of collision
- Great Egret (*Ardea modesta*) – Low risk of collision
- White-bellied sea-eagle (*Haliaeetus leucogaster*) – Low risk of collision
- Black-faced monarch (*Monarcha melanopsis*) - Low risk of collision
- Spectacled Monarch (*Monarcha trivirgatus* (syn. *Symposiarchus trivirgatus*)) – Low risk of collision
- Satin Flycatcher (*Myiagra cyanoleuca*) - Low risk of collision
- Cicadabird (*Coracina tenuirostris*) - Low risk of collision
- Migratory Shorebirds - Low risk of collision

Impacts to populations of Least Concern species with a moderate to high risk of collision are considered low given their stable populations and widespread distribution.

The potential consequences associated with collision based impacts to the populations of White-throated Needletail (*Hirundapus caudacutus*) and Fork-tailed Swift (*Apus pacificus*) are discussed below as they are conservation significant species with a high risk of collision.

White-throated Needletail (*Hirundapus caudacutus*)

This species is a non-breeding summer migrant (October – April) to Australia. It occurs in high open spaces above a wide range of habitats, such as oceans, ranges and headlands (Morcombe, 2003). During the summer months, the White-throated Needletail is widespread in eastern and south-eastern Australia. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains (DoE, 2019).

Large tracts of native vegetation, particularly forest, may be a key habitat requirement for the species (DoE, 2015). In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1m up to more than 1000m above the ground (DoE, 2019).

They often forage in areas of updraughts, such as ridges, cliffs or sand-dunes, or in the smoke of bushfires, or in whirlwinds. They often forage along the edges of low pressure systems, which both lift their food sources and assist with their flight, and it is said that they follow these systems across Australia (DoE, 2019).

There are no published estimates of the extent of occurrence of the White-throated Needletail in Australia, although the species occurs at numerous and widespread sites in eastern Australia (DoE, 2019).

Surveys demonstrated the occurrence and abundance of this species across the Project Area (PLA) is highly variable. The two survey occasions when they were recorded in flocks greater than 100 were on days associated with local bushfires or stormfronts. The *draft referral guideline for 14 birds listed migratory under the EPBC Act* (DoE, 2015) lists ecologically significant proportions of each species population, which is 100 individuals (international proportion) or 10 individuals (national proportion) for the WTN. A significant impact involves the loss of this many birds from the population in a year. Two (2) of the 139 BUS assessments recorded numbers greater than 100 and five (5) of the 139 surveys recorded numbers greater than 10 (3 of those 5 were less than 20 individuals).

Potential collision with wind turbines is considered of low risk to the population. This is also consistent with the DoE Conservation advice regarding the assessment of threats to the WTN (Table 1, item 2.1 of the Approved Conservation Advice, 4 July 2019).

Fork-tailed Swift (*Apus pacificus*)

This species is a non-breeding summer migrant (October – April) to Australia. It occurs in low to very high airspace over variety of habitats including rainforest and semi-arid areas. Known to be most active in front of summer storm fronts (Morcombe, 2003).

The Fork-tailed Swift is almost exclusively aerial, flying from less than 1m to at least 300m above the ground and probably much higher (DoE, 2019). They forage along the edge of low pressure systems and for that reason are considered a precursor to unsettled weather. The low pressure system helps to lift prey, such as insects, from the ground and assists in flight (DoE, 2019).

They are widespread but scattered in coastal areas from 20°S, south to Brisbane and in much of the south south-eastern region. They are more widespread west of the Great Dividing Range, and are commonly found west of the line joining Chinchilla and Hughenden (DoE, 2019).

Surveys demonstrated the occurrence and abundance of this species across the Project Area (PLA) is highly variable. FTS were recorded in their highest numbers (up to 51 individuals) on 29 November 2018 which was associated with severe local bushfires. This number is less than the ecologically significant proportion for FTS (1000 and 100 for International and National proportions, respectively) individuals as described in the *draft referral guideline for 14 birds listed migratory under the EPBC Act* (DoE, 2015).

Potential collision with wind turbines is considered of low risk to the population as numbers observed during surveys are less than the ecological significant proportion of 100 individuals.

4.2.2.2 Bats

Of the two major groups of bats (microbats and megabats) all reported fatalities of bats from wind turbines in Australia and overseas, have been microbats (Australian Bat Society Inc., 2017). Although there are no reported fatalities of megabats (eg. flying-foxes), this may be attributed to most Australian wind farms not being in areas of flying-fox roosts or potential foraging areas. As such, they may be at risk of collision or barotrauma.

Operation of the wind farm has the potential to result in susceptibility of collision with wind turbines. A risk assessment of potential consequence of collision has been undertaken for all bat species identified within the Project Area (PLA) or within dispersal distances (ie flying-foxes) from the Project Area (PLA) (Table 14).

Table 14 Bat Risk Assessment

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
Megabats			
Grey-headed flying-fox <i>Pteropus poliocephalus</i> EPBC – V NC Act – Least Concern	High	<p>A canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, <i>Melaleuca</i> swamps and <i>Banksia</i> woodlands (DoE, 2019). Roost sites are typically located near water, such as lakes, rivers or the coast.</p> <p>The Grey-headed Flying-fox is highly mobile and the national population is fluid, moving up and down the east coast in search of food (DoE, 2019). Grey-headed Flying-fox presence will be dependent on food resources. The time and location of flowering and fruiting of diet plants varies among seasons and years. In particular, drought years can have a strong influence on eucalypt flowering times. Sites noted as important in one year or period may not be visited again in the following year (DoE, 2019).</p> <p>The relatively small amount of native vegetation within the pine plantation is not considered core foraging habitat compared to the surrounding native state forests, National Parks and agricultural areas, outside of the Project Area (PLA).</p> <p>Local populations dispersing at night are also likely to be below the RSA height.</p> <p>Infrequent collision due to local dispersal flight height, absence of roosts within the Project Area (PLA) and the widespread distribution of preferred foraging habitat outside of the project area. However due to their nomadic lifestyle and likely poor maneuverability they are considered at risk of collision.</p>	Moderate
Little red flying-fox (LRFF) <i>Pteropus scapulatus</i>	Moderate	<p>Little red flying foxes are nomadic, predominately blossom feeders. They congregate in large camps, often beside water, commonly sharing camps with other flying fox species.</p> <p>They are found in a broad range of habitats, across the north and east of Australia. All dominant tree species are included in their diet and their nomadic lifestyle enables them</p>	Moderate

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
<p><i>EPBC Act – Not Listed</i></p> <p><i>NC Act - Least Concern</i></p>		<p>to utilize an unpredictable food supply.</p> <p>As with other flying fox species, their presence in an area can be highly variable one year to the next, depending on the flowering of food tree species, as some eucalyptus can produce large amounts of blossoms one year and little the next (Churchill 2008).</p> <p>They are not very maneuverable and are often found caught in barbed wire fences (ALA, 2020).</p> <p>Infrequent collision due to distance from nearest camps, however due to their nomadic lifestyle and poor maneuverability they are considered at risk of collision.</p>	
<p>Black flying fox (BFF)</p> <p><i>Pteropus Alecto</i></p> <p><i>EPBC Act – Not Listed</i></p> <p><i>NC Act – Least Concern</i></p>	Moderate	<p>Black flying foxes are found in a wide range of habitats in tropical and subtropical woodlands, feeding predominately on the fruit and blossoms of eucalypts, <i>Melalueca</i> and Turpintines. They camp in mangroves, rainforests, <i>Melalueca</i>, bamboo and monsoon forest, often using the same camp for many years (Churchill 2008).</p> <p>They are migratory, roosting in large numbers high in the tree canopy during the day, leaving to feed at dusk. They generally disperse to smaller camps over the winter and recongregate in spring, summer (Australian Museum, 2020).</p> <p>Infrequent collision due to distance from nearest camps, however due to their nomadic lifestyle and poor maneuverability they are considered at risk of collision.</p>	Moderate
Microbats			
<p>Eastern horseshoe bat</p> <p><i>Rhinolophus megaphyllus</i></p> <p><i>EPBC Act – Not Listed</i></p> <p><i>NC Act – Least Concern</i></p>	Known to occur	<p>Eastern horseshoe bats are cave dwellers, found in a wide variety of caves, abandoned mines and can also be found in tree hollows, roosting mostly in complete darkness. They are found in tropical and temperate rainforest along the east coast of Australia. They are much more active in mature forests than in regrowth, avoiding large cleared areas (Churchill 2008).</p> <p>They hunt flying and non-flying insects and spiders, with moths being their dominant food. They have a slow, but highly maneuverable flight pattern, and can fly close to the ground to catch their prey, which is often taken to a temporary roost to be eaten. They use echolocation and are well adapted</p>	Low

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
		<p>to hunting for insects in dense foliage (Churchill 2008 & Australian Museum).</p> <p>Eastern horseshoe bats were recorded within the Project Area (PLA). Due to their flight behavior and maneuverability they are considered at low risk of collision.</p>	
<p>Gould's wattled bat</p> <p><i>Chalinolobus gouldii</i></p> <p>EPBC Act – Not Listed</p> <p>NC Act – Least Concern</p>	<p>Known to occur</p>	<p>The Gould's wattled bat's distribution is widespread and they found in almost all habitats throughout Australia. They insectivorous, feeding on bugs and moths predominately, as well as a wide variety of other insects.</p> <p>They fly just below or within the lower level of the tree canopy and are agile flyers.</p> <p>They roost most commonly in tree hollows and hollow limbs of mature trees, particularly river red gums and cypress pines. They move daily between a number of roost sites and are highly adaptable (Churchill, 2008).</p> <p>Mortalities have been recorded at other Australian wind farms (BL & A, 2018 and Boothroyd, <i>et al.</i> 2012).</p> <p>Gould's wattled bat were recorded within the Project Area (PLA). Given previous mortalities at other wind farms and presence on the Project Area (PLA), they are considered at risk of collision.</p>	<p>High</p>
<p>Hoary wattled bat</p> <p><i>Chalinolobus nigrogriseus</i></p> <p>EPBC Act – Not Listed</p> <p>NC Act – Least Concern</p>		<p>The Hoary wattled bat is found in the north/north east of Australia, in a range of habitat types including monsoon forests, dry sclerophyll forest, littoral rainforest, river red gum riparian woodland, vine thickets, coastal scrub, sand dunes, grasslands and floodplains. They roost in primarily in hollows in eucalyptus trees.</p> <p>They are agile flyers and can change course quickly in response to prey movements. They are insectivores, with a preference for beetles, ants and moths but will also eat a range of other prey species.</p> <p>Little flight height information is available for this species, however given it is an aerial insectivore it is considered at high risk of collision.</p>	<p>High</p>
<p><i>Nyctophilus</i> sp.</p> <p>EPBC Act –</p>	<p>Known to occur</p> <p>(all may potentially occur)</p>	<p>Three <i>Nyctophilus</i> species are potentially present in the windfarm area.</p> <p><i>Nyctophilus bifax</i>, Eastern long-eared bat</p> <p><i>Nyctophilus geoffroyi</i>, Lesser long-eared bat</p>	<p>Low</p>

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
<p><i>Not Listed</i></p> <p>NC Act – Least Concern</p>	<p>however could not speciate beyond genus level)</p>	<p><i>Nyctophilus gouldi</i>, Gould’s long-eared bat</p> <p><i>Nyctophilus bifax</i>, are found along the eastern coast of Qld to northern NSW, favouring wetter habitats, including rainforest and monsoon forests, but are also found in open woodlands, tall open forest and dry sclerophyll forests. They primarily eat moths, along with other insects including ants and click-beetles. They have been observed perch hunting, making short flights to catch prey (Churchill, 2008).</p> <p><i>Nyctophilus geoffroyi</i> are widespread across Australia and are found in a broad range of habitats, from deserts to rainforests, agricultural land, urban areas, tropical to alpine woodlands and grasslands. They are highly maneuverable flyers feeding on moths, crickets and grasshoppers, primarily, but their diet also includes a range of other insects. They roost in crevices and tree hollows, often alone or in small groups (Churchill, 2008).</p> <p><i>Nyctophilus gouldi</i> are found in a range of habitats across eastern Australia and the SW of WA. They are found in wet and dry sclerophyll forests, <i>Melaleuca</i>, red river gum waterways, woodlands and <i>Acacia</i> shrubland. They usually roost along creek lines, in tree hollows, fissures and under peeling bark. They generally fly in 2-5m above the ground under the canopy of forest trees, to catch their prey, which consists mainly of moths and beetles, but as with other <i>Nyctophilus sp.</i>, a range of insects are included in their diet (Churchill, 2008).</p> <p>Recorded during bat surveys on Project Area (PLA). Given low flight behavior they are considered low risk of collision.</p>	
<p>Little broad-nosed bat</p> <p><i>Scotorepens greyii</i></p> <p>EPBC Act – Not Listed</p> <p>NC Act –</p>	<p>Known to occur</p>	<p>Little broad-nosed bats are abundant in the north of Australia and are commonly caught near water. Their range of habitats include monsoon forest, <i>Melaleuca</i> forest, tall and open forest, open woodland, mulga shrubland, mixed shrubland, escarpments, grasslands, river red gum-lined waterways and <i>Pandanus</i>. They are continuous flight foragers, with moderately fast, agile flight. Their diet consists mostly of beetles, bugs and ants. They search for insects close to tree-tops, but not usually above them.</p>	<p>Low</p>

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
<i>Least Concern</i>		<p>They roost in tree hollows, fence posts as well as disused buildings, in small groups usually less than 20 bats (Churchill 2008).</p> <p>Recorded within the Project Area (PLA) during bat surveys. Given flight behavior below the canopy, they are considered low risk of impact.</p>	
Little bent-wing bat <i>Miniopterus australis</i> EPBC Act – Not Listed NC Act – Least Concern	Known to occur	<p>Little bent-wing bats are found along the east coast of Australia, in well timbered areas including rain forest, wet and dry sclerophyll forests, vine thickets, <i>Melaleuca</i> swamps and coastal forests. They are cave dwellers, congregating in maternity colonies in summer and dispersing in winter. Their diet consists primarily of beetles, moths, spiders and flies. They are maneuverable flyers between the shrub and canopy layers of forests.</p> <p>Recorded within the Project Area (PLA) during bat surveys. Given flight behavior below the canopy, they are considered low risk of impact.</p>	Low
Australian bent-wing bat <i>Miniopterus orianae</i> EPBC Act – Not Listed NC Act – Least Concern	Known to occur	<p>They are found east primarily east of the Great Dividing Range, along the east coast of Australia. Their habitat includes rainforests, wet and dry sclerophyll forest, monsoon forests, open grasslands, open woodlands and <i>Melaleuca</i> forests.</p> <p>In forested areas this species flies high, above the canopy, to many times the canopy height. Their diet consists mostly of moths, along with other insects including flies, cockroaches and beetles. They can forage up to 65kms from their roost sites, which are predominately caves, but can be found in man-made structures, such as road culverts (Churchill 2008).</p> <p>Given their flight behavior many times the canopy height and feeding on aerial insects, they are considered high risk of collision.</p>	High
White-striped freetail bat <i>Austronomus australis</i> EPBC Act – Not Listed	Known to occur	<p>White-striped freetail bats are broadly distributed across southern Australia and found in a wide range of habitats from deserts, grasslands, forests, urban areas, woodlands, shrublands and open agricultural landscapes. They are a tree-dwelling species with roost colonies of up to 300 individuals. In summer they migrate south to cooler areas (Churchill 2008).</p> <p>Their diet includes moths, beetles and</p>	High

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
<p><i>NC Act – Least Concern</i></p>		<p>grasshoppers as well as ground dwelling insects such as ants and non-flying beetles.</p> <p>They are a fast flying species, but are not designed for maneuverability (Churchill 2008), which may increase their risk of colliding with turbines.</p> <p>Mortalities have been recorded at other Australian wind farms (BL & A, 2018 and Boothroyd, <i>et al.</i> 2012).</p> <p>Recorded within the Project Area (PLA) during bat surveys. Given their low maneuverability and previous collisions at other Australian wind farms, they are considered high risk of collision.</p>	
<p>Ride’s free-tailed bat</p> <p><i>Ozimops ridei</i></p> <p><i>EPBC Act – Not Listed</i></p> <p><i>NC Act – Least Concern</i></p>	Known to occur	<p>Found along the East coast of Australia in a wide range of habitats, including rainforest, <i>Melaleuca</i> forests, monsoon forests, woodlands and open forests. The bats fly predominately through trees to forage for bugs, flies and beetles. They roost mainly in tree hollows but can be found in building, cracks in fence posts and under bark (Churchill 2008).</p> <p>Recorded in Project Area (PLA) during bat surveys. Flight behaviour is predominantly below canopy, however not always, as such they are considered at moderate risk of collision.</p>	Moderate
<p>Northern free-tailed bat</p> <p><i>Ozimops lumsdenae</i></p> <p><i>EPBC Act – Not Listed</i></p> <p><i>NC Act – Least Concern</i></p>	Known to occur	<p>Widely distributed across northern Australia from Western Australia to Qld, extending south to the north-east corner of NSW. They are found in habitats ranging from rainforests to open forests and woodlands, and are often recorded along watercourses.</p> <p>They are found Roosting mainly in tree hollows but relatively large colonies have also found under house roofs in urban areas (NSW Govt. 2018).</p> <p>Recorded in Project Area (PLA) during bat surveys. Little known on flight behavior however is assumed similar to <i>O. ridei</i> and therefore considered moderate risk of collision.</p>	Moderate
<p>Yellow-bellied sheath-tail bat</p> <p><i>Saccolaimus flaviventris</i></p>	Known to occur	<p>Yellow bellied sheath-tail bats have a wide distribution across most of north eastern Australia. They are found in a broad range of habitats, from desert to grasslands, wet and dry sclerophyll forests, open woodlands, Acacia scrubland and mallee. They migrate to southern Australia during the summer, generally January – March.</p>	High

Species	Likelihood of Occurrence	Distribution and Flight Behaviours	Susceptibility of Collision
<i>EPBC Act – Not Listed</i> <i>NC Act – Least Concern</i>		<p>They roost in large tree hollows in colonies of up to 30 individuals.</p> <p>They fly fast and straight, usually above the canopy, unless flying out in the open, where they will fly lower. Their diet consists mainly of beetles, however they will also eat a range of other insects including grasshoppers, crickets, leafhoppers, wasps, shield bugs and flying ants (Churchill, 2008).</p> <p>Recorded in Project Area (PLA) during bat surveys. Given their flight behavior above the canopy and diet including aerial insects, they are considered high risk of collision.</p>	

Nine of the 13 Least Concern (NC Act) microbat species recorded within the Project Area (PLA) are considered to have a moderate to high risk of collision due to their flight behaviour. Impacts to populations of Least Concern bat species with a moderate to high risk of collision are considered low given their stable populations and widespread distribution. Nonetheless, the bird and bat monitoring plan includes all bat species (including least concern) to ensure potential impacts are monitored and mitigated if required.

The potential consequences associated with collision based impacts to the population of GHFF (*Pteropus poliocephalus*) is discussed below as they are a conservation significant species.

4.2.3 Consequence of Collision (Bats)

Grey-headed flying-fox (*Pteropus poliocephalus*)

GHFF is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, *Melaleuca* swamps and *Banksia* woodlands (DoE, 2019). Roost sites are typically located near water, such as lakes, rivers or the coast.

The GHFF is highly mobile and the national population is fluid, moving up and down the east coast in search of food (DoE, 2019). Grey-headed Flying-fox presence will be dependent on food resources. The time and location of flowering and fruiting of diet plants varies among seasons and years. In particular, drought years can have a strong influence on eucalypt flowering times. Sites noted as important in one year or period may not be visited again in the following year (DoE, 2019).

There are seven (7) known GHFF camps within 50km of the wind turbine project area. The definition of a Nationally Important GHFF Camp is defined for the management of GHFF and Spectacled Flying-fox camps, specifically relating to *in-situ* camp management. Camps that have contained $\geq 10,000$ GHFF in more than one year in the last 10 years, or have been occupied by more than 2,500 GHFF permanently or seasonally every year for the last 10 years (*EPBC Policy Statement, September 2015*) are considered Nationally Important Camps.

Four (4) of the seven (7) camps are Nationally Important Flying-fox Colonies (Maaroom, Glenwood Varley Road, Gympie and Woocoo) which are a minimum 4km, 14km, 30km and 40km from the nearest turbine, respectively. The Gympie colony is 66km from the furthest turbine, while Woocoo is 65km from the furthest turbine. Vast areas of foraging habitat are present between the camps and project area (refer Table 15).

The two closest camps are Anderleigh Road (9km and 49km (closest and furthest turbine)) and Maaroom (4km and 42km). These camps are known to fluctuate over time, however surveys undertaken since 2012 for the National Flying-fox Monitoring Program indicate they generally average between 2,500 – 9,999 (category 3) individuals.

The relatively small amount of native vegetation (refer Section 4.2.2) within the pine plantation is not considered core foraging habitat compared to the surrounding native state forests and National Parks, outside of the Project Area (PLA). Local populations dispersing at night are also likely to be below the RSA height.

Infrequent collision due to local dispersal flight height, absence of roosts within the Project Area (PLA), camp size (category 3) and the widespread distribution of preferred foraging habitat outside of the project area is therefore considered to pose a low risk to the National population.

4.2.4 GHFF Foraging Resources

GHFF require foraging resources and roosting sites (DoEE, 2019). No roosts are known within the Project Area (PLA) however the mosaic of remnant vegetation amongst the exotic pine plantations may occasionally provide foraging resources such as when the vegetation is in flower. GHFF usually forage up to 15km of the day roost site, although they are capable of nightly foraging flights of up to 50km from their camp as resource availability changes (DoEE, 2019). Irregular GHFF migration may also occur between camps subject to food availability.

Within these 15km and 50km foraging zones from each camp, most of the available GHFF foraging habitat (96 – 100%) is outside of the Project Area (PLA) (ie. 0-4% within the WTA). Refer to Figure 6 for the foraging areas of each GHFF camp and Table 12 for the areas and proportions of available foraging habitat. This demonstrates the low likelihood of foraging behaviour within the Project Area (PLA) as opposed to the available foraging habitat and associated behavior outside the WTA.

Calculations are considered conservative as they exclude non-remnant vegetation outside the Project Area (PLA) which could also include orchards and regrowth vegetation (which is largely absent from the Project Area (PLA), other than regrowth within the exotic pine plantations which is regularly slashed) which would provide additional foraging habitat outside of the Project Area (PLA). As such, the foraging habitat within the Project Area (PLA) is likely an over estimate.

Table 15 GHFF Foraging Habitat Outside of Project Area (PLA)

GHFF Camp	Foraging radius from camp	Mapped remnant vegetation outside Project Area (PLA) within foraging radius (ha)	Mapped remnant vegetation inside Project Area (PLA) within foraging radius (ha)	Total remnant within foraging radius	% of Foraging Habitat	
					Outside Project Area (PLA)	Inside Project Area (PLA)
Glenwood	15km	35,514	142	35,657	99.60%	0.4%
	50km	394,078	8,887	402,965	97.79%	2.21%
Maaroom	15km	29,454	737	30,191	97.56%	2.44%
	50km	334,648	8,887	343,535	97.41%	2.59%
Goomborium	15km	29,488	1,281	30,769	95.84%	4.16%
	50km	349,507	8,853	358,360	97.53%	2.47%

GHFF Camp	Foraging radius from camp	Mapped remnant vegetation outside Project Area (PLA) within foraging radius (ha)	Mapped remnant vegetation inside Project Area (PLA) within foraging radius (ha)	Total remnant within foraging radius	% of Foraging Habitat	
					Outside Project Area (PLA)	Inside Project Area (PLA)
Maryborough Albion Road	15km	33,531	53	33,585	99.84%	0.16%
	50km	398,666	7,850	406,516	98.07%	1.93%
Gympie	15km	29,917	0	29,917	100.00%	0.0%
	50km	408,925	6,643	415,568	98.40%	1.6%
Woocoo	15km	46,740	0	46,740	100.00%	0.0%
	50km	420,312	3,404	423,717	99.20%	0.8%
Maryborough Tinana Cr	15km	29,563	197	29,760	99.34%	0.66%
	50km	400,221	8,822	409,043	97.84%	2.16%

The above table excludes non-remnant areas (which could also be foraging areas such as orchards outside of the Project Area (PLA)) and waterways (including oceans, estuaries and canals).

5 MITIGATION MEASURES

Mitigation measures proposed are in accordance with industry standards and the mitigation recommendations provided in *Wind Farm Industry EPBC Act Policy Statement 2.3 (DoE, 2009)*.

Avoidance is the guiding principal to minimising impacts on MNES (and MSES). Avoidance measures utilised in the Project include:

- The Project is set back a minimum of 4km from the Great Sandy Strait which is a known significant non-breeding area for EPBC listed migratory shorebirds.
- The Project Area (PLA) is located within an existing exotic pine plantation and avoids native vegetation and waterways.
- Electrical cabling will mostly be underground along existing access tracks which will further reduce the likelihood of collision and/ or electrocution of birds and bats.
- Other infrastructure such as construction compounds avoid native vegetation and waterways and therefore avoid damage to remnant areas of natural habitat.
- Existing forestry tracks will be used to provide access within the Project Area (PLA) and therefore avoids disturbance to native vegetation and habitat.
- An Erosion and Sediment Control Plans (ESCP) will be required to be developed by a Certified Professional in Erosion and Sediment Control (CPESC) prior to construction commencing and implemented throughout the construction phase.

Additional mitigation measures to reduce collision based impacts during operation are associated with adaptive management and reducing the risk of attracting birds and bats into the RSA of the wind farm. This includes:

- An adaptive management bird and bat monitoring program will be implemented. Should the monitoring program's results demonstrate that further mitigation is required, further assessment will be undertaken to determine appropriate mitigation or management

measures. Additional measures may include deploying a radar detection and deterrent technology system

- Spatially and temporarily replicated carcass monitoring undertaken by suitably qualified ecologists or trained detector dogs or other approved method. This will be used to identify particular turbines that may be causing excessive number of deaths. Monthly surveys to be undertaken at a stratified random representative selection of turbines. Surveys will also be timed to occur at times of flowering of eucalypt and melaleuca where possible. If carcasses are identified repeatedly for a period of 3 months a strategy will be developed and implemented to manage the risk of collision such as slow rotor speeds or temporary shutdown of subject turbines
- A Project specific Bird and Bat Management Plan has been prepared which outlines the objectives and monitoring program.

6 CONCLUSION

This report presents the results of the bird and bat utilisation survey, and accompanies the baseline fauna investigation and Bird and Bat Management Plan prepared by Fox & Co Environmental (2019). The bird utilisation survey has been designed to comply with State code 23: Wind farm development (the code) (Queensland Government, 2018). The potential impacts to birds and bats have been assessed and specific mitigation measures to reduce the severity of potential impacts identified.

Desktop assessments and detailed field surveys have been undertaken across the Project Area (PLA), including external reference sites outside of the Project Area (PLA), since 2016. Key findings of the assessments include:

Bird Utilisation Survey

- 139 fixed-point BUS assessments have been undertaken across the study area (including reference sites) between December 2016 and April 2019.
- 66 bird species were recorded
- Five (5) of the 64 bird species were of conservation significance:
 1. White-throated needletail (*Hirundapus caudacutus*) – V, MT, LM (EPBC Act)
 2. Fork-tailed swift (*Apus pacificus*) – MT (EPBC Act)
 3. Spectacled Monarch (*Monarcha trivirgatus* syn. *Symposiarchus trivirgatus*) – LM, MT (EPBC Act)
 4. Rainbow bee-eater (*Merops ornatus*) – LM (EPBC Act)
 5. Cicadabird (*Coracina tenuirostris*) – LM (EPBC Act)
- No migratory shorebirds were observed flying over the site during known migratory activity periods suggesting the movement pathways are north – south along the Queensland coastline.
- 71% of the birds are considered to have low risk flight behaviours, occurring below the RSA on all recorded occasions. 92% of all bird species were recorded below the RSA, however some of these species are still capable of flying at or above the RSA
- Six (6) bird species were identified flying at or above RSA which included:
 - White-throated needletail (*Hirundapus caudacutus*) – V, MT, LM (EPBC Act)
 - Fork-tailed swift (*Apus pacificus*) – MT (EPBC Act)
 - Whistling kite (*Haliastur sphenurus*) – least concern
 - Wedge-tailed eagle (*Aquila audax*) – least concern
 - Channel-billed cuckoo (*Scythrops novaehollandiae*) – least concern
 - Tree martin (*Petrochelidon nigricans*) – least concern
- The potential impact of the five (5) bird species of conservation significance was assessed.
- It was determined that although the risk of collision of some bird species (WTN and FTS) may occur, the likelihood of impacting the International and/or National population of these species is considered low. This is due to the widespread distribution of the species and the highly variable occurrence and abundance of this species across the Project Area (PLA).

Bat Utilisation Survey

- Up to 14 species of microbat were recorded during the bat surveys.
- None of the microbat species recorded are threatened species under the NC Act or EPBC Act
- There are seven (7) grey-headed flying-fox camps within 50km of the Project Area (PLA), which have been active over the past five (5) years. Camps are often mixed with LRFF or BFF. Four (4) of the seven (7) camps are Nationally Important Grey-headed Flying-fox Colonies which are 4km, 14km, 30km and 40km from the nearest turbine. Given the distance to the site, relatively small amount of remnant vegetation (foraging habitat) on site and significant widespread foraging areas between these camps and the site, significant impacts to these populations are considered unlikely.
- As above, given the large areas of intact native vegetation outside of the Project Area (PLA) (95-100% of foraging resources within foraging zones) and relatively small amount of native foraging vegetation within the turbine area (0-4%), and local flight behaviour, the risk of collision-based impacts on other grey-headed flying-fox colonies within 50km of the turbine area is considered low.
- No daytime GHFF, LRFF or BFF roosts are known within the Project Area (PLA).

7 WORKS CITED AND RELEVANT REFERENCE DOCUMENTS

Atlas of Living Australia (2020). <https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:dco66f2a-cf9e-42ce-9277-62d656df98ca> (Little red flying-fox, 2020).

Atlas of Living Australia (2020). <https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:c689b57c-e29e-41bd-92e4-7610a6e985d4> (Hoary wattled bat)

Atlas of Living Australia (2020). <https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:6357ec0c-d13e-482c-9066-b119f488e54a> (*N. gouldi*)

Atlas of Living Australia (2020). <https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:efe63af5-89a6-4d09-90b8-205a9407cab8> (*N. bifax*)

Atlas of Living Australia (2020). <https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:d794770b-6bdd-45e8-ba78-2d833b87699a> (*N. geoffroyi*)

Atlas of Living Australia (2020). <https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:49830080-471e-4a13-9f3d-9f0eb595905c> (*S. greyii*)

Atlas of Living Australia (2020). <https://bie.ala.org.au/species/urn:lsid:biodiversity.org.au:afd.taxon:91d244a5-7088-4856-81a6-31f1026e81cc#overview> (*M. australis*)

Australian Museum (2020). <https://australianmuseum.net.au/learn/animals/mammals/black-flying-fox/>

Australian museum (2020). <https://australianmuseum.net.au/learn/animals/bats/eastern-horseshoe-bat/>

Bamford M, Watkins D, Bancroft W, T. G. and J. W. (2008). Migratory Shorebirds of the East Asian - Australasian Flyway; Population Estimates and Internationally Important Sites.

Birdlife Australia (2020). Australian Painted Snipe *Rostratula australis*

Boothroyd, Ian & Barea, Laurence. (2012). Wind and Wildlife : Proceedings from the Conference on Wind Energy and Wildlife Impacts, October 2012, Melbourne, Australia.

Brett Lane & Associates (2018), Ararat Wind Farm – Bird and Bat Monitoring Program, First Year Annual Report April 2017 to March 2018

Forest Wind Bird and Bat Utilisation Survey
 FWH-01

Churchill, S (2008). Australian Bats 2nd edition, Allen & Unwin Publishing

Department of the Environment (2016). Conservation Advice *Charadrius mongolus* lesser sand plover

Department of the Environment (2019). *Pteropus poliocephalus* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed Tue, 6 Aug 2019 16:53:52 +1000.

Department of the Environment (2019). *Haliaeetus leucogaster* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed Wed, 7 Aug 2019 09:59:36 +1000.

Department of the Environment (2019). *Hirundapus caudacutus* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed Wed, 7 Aug 2019 09:37:22 +1000.

Department of the Environment (2019). *Xenus cinereus* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed Wed, 7 Aug 2019 11:20:59 +1000.

Department of the Environment (2019). *Tringa brevipes* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed Wed, 7 Aug 2019 11:29:51 +1000.

Department of the Environment (2019). *Tringa nebularia* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed Wed, 7 Aug 2019 11:36:41 +1000.

Department of the Environment (2019). *Charadrius mongolus* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed Wed, 7 Aug 2019 11:43:37 +1000.

Department of the Environment (2019). *Numenius phaeopus* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <http://www.environment.gov.au/sprat>. Accessed Wed, 7 Aug 2019 11:46:37 +1000.

Department of the Environment (2015). Referral guideline for 14 birds listed as migratory species under the EPBC Act, September 2015

Gove, B. (2013). Wind Farms and Birds: An Updated Analysis of the Effects of Wind Farms on Birds, and Best Practice Guidance on Integrated Planning and Impact Assessment.

Higgins, P.J., 1999. Handbook of Australian, New Zealand and Antarctic birds Volume 4., Melbourne, Victoria: Oxford University Press.

Morcombe, M., 2003. Field Guide to Australian Birds, Archerfield: Steve Parish Publishing Pty Ltd.

NSW Government (2020). <https://www.environment.nsw.gov.au/threatenedSpeciesApp/profile.aspx?id=10543> (*O. lumsdenae*)

Forest Wind Bird and Bat Utilisation Survey
FWH-01

Piersma, T; Zwarts, L and Bruggemann, J H (1990) Behavioural aspects of the departure of waders before long distance flights: flocking, vocalisations, flight paths and diurnal timing. *Ardea* 78: 157-184

Piersma, T; Hedenstrom, A and Bruggemann, J H (1997) Climb and flight speeds of shorebirds embarking on an intercontinental flight; do they achieve the predicted optimal behaviour? *Ibis* 139: 299-304

Poole, E. 2011. "Pelecanus conspicillatus" (On-line), Animal Diversity Web. Accessed January 29, 2020 at https://animaldiversity.org/accounts/Pelecanus_conspicillatus

Simpson, K. & Day, N. (2004). *Field Guide to the Birds of Australia* (7th ed.). Camberwell: Penguin Group

Threatened Species Scientific Committee (July 2019), Conservation Advice, *Hirundus caudacutus* (White-throated Needletail) Conservation Advice

APPENDIX A

Fixed Bird Count Results

Table 16 Species List

Family	Scientific Name	Common Name	EPBC Act ¹	NC Act ²
Birds				
Acanthizidae	<i>Gerygone olivacea</i>	White-throated gerygone	-	-
Accipitridae	<i>Aquila audax</i>	Wedge-tailed eagle	-	-
Accipitridae	<i>Circus assimilis</i>	spotted harrier	-	-
Accipitridae	<i>Elanus caeruleus</i>	Black-winged kite	-	-
Accipitridae	<i>Haliastur sphenurus</i>	Whistling kite	-	-
Alcedinidae	<i>Todiramphus macleayi</i>	Forest kingfisher	-	-
Apodidae	<i>Apus pacificus</i>	Fork-tailed swift	MM, LM	SLC
Apodidae	<i>Hirundapus caudacutus</i>	White-throated needletail	V, MT, LM	SLC
Apodidae	<i>Hirundo neoxena</i>	Welcome swallow	-	-
Ardeidae	<i>Ardea pacifica</i>	White-necked heron	-	-
Artamidae	<i>Cracticus nigrogularis</i>	Pied butcherbird	-	-
Artamidae	<i>Cracticus tibicen</i>	Australian magpie	-	-
Artamidae	<i>Cracticus torquatus</i>	Grey butcherbird	-	-
Artamidae	<i>Strepera graculina</i>	Pied currawong	-	-
Cacatuidae	<i>Cacatua galerita</i>	Sulphur-crested cockatoo	-	-
Cacatuidae	<i>Zanda funereus</i>	Yellow-tailed black-cockatoo	-	-
Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced cuckoo-shrike	-	-
Campephagidae	<i>Coracina tenuirostris</i>	Cicadabird	LM	-
Casuariidae	<i>Dromaius novaehollandiae</i>	Emu	-	-
Cisticolidae	<i>Cisticola exilis</i>	Golden-headed cisticola	-	-
Climacteridae	<i>Cormobates leucophaea</i>	White-throated treecreeper	-	-
Columbidae	<i>Geopelia humeralis</i>	Bar-shouldered dove	-	-
Columbidae	<i>Geopelia striata</i>	Peaceful dove	-	-
Columbidae	<i>Macropygia amboinensis</i>	Brown cuckoo-dove	-	-
Columbidae	<i>Phaps chalcoptera</i>	Common bronzewing	-	-
Columbidae	<i>Ptilinopus superbus</i>	Superb fruit-dove	-	-
Corcoracidae	<i>Grallina cyanoleuca</i>	Magpie-lark	-	-
Corvidae	<i>Corvus orru</i>	Torresian crow	-	-
Cuculidae	<i>Centropus phasianinus</i>	Pheasant coucal	-	-
Cuculidae	<i>Chalcites lucidus</i>	Shining bronze-cuckoo	-	-
Cuculidae	<i>Scythrops novaehollandiae</i>	Channel-billed cuckoo	-	-
Dicruidae	<i>Dicrurus bracteatus</i>	spangled drongo	-	-
Estrildidae	<i>Neochmia temporalis</i>	Red-browed finch	-	-
Estrildidae	<i>Taeniopygia bichenovii</i>	Double-barred finch	-	-
Falconidae	<i>Falco berigora</i>	Brown falcon	-	-
Falconidae	<i>Falco longipennis</i>	Australian hobby	-	-
Falconidae	<i>Falco peregrinus macropus</i>	Peregrine falcon	-	-
Halcyonidae	<i>Dacelo novaeguineae</i>	Laughing kookaburra	-	-
Hirundinidae	<i>Petrochelidon nigricans</i>	Tree martin	-	-
Maluridae	<i>Malurus lamberti</i>	Variegated fairy-wren	-	-
Maluridae	<i>Malurus melanocephalus</i>	Red-backed fairy-wren	-	-
Meliphagidae	<i>Lichenostomus chrysops</i>	Yellow-faced honeyeater	-	-

Family	Scientific Name	Common Name	EPBC Act ¹	NC Act ²
Meliphagidae	<i>Lichmera indistincta</i>	Brown honeyeater	-	-
Meliphagidae	<i>Manorina melanocephala</i>	Noisy miner	-	-
Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater	-	-
Meliphagidae	<i>Myzomela sanguinolenta</i>	Scarlet honeyeater	-	-
Meliphagidae	<i>Philemon citreogularis</i>	Little friarbird	-	-
Meliphagidae	<i>Philemon corniculatus</i>	Noisy friarbird	-	-
Meropidae	<i>Merops ornatus</i>	Rainbow bee-eater	LM	-
Monarchidae	<i>Myiagra inquieta</i>	Restless flycatcher	-	-
Monarchidae	<i>Myiagra rubecula</i>	Leaden flycatcher	-	-
Monarchidae	<i>Symposiarchus trivirgatus</i>	Spectacled monarch	LM, MT	-
Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit	-	-
Nectariniidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird	-	-
Oriolidae	<i>Oriolus sagittatus</i>	Olive-backed oriole	-	-
Oriolidae	<i>Sphecotheses vieilloti</i>	Australasian figbird	-	-
Pachycephalidae	<i>Colluricincla harmonica</i>	Grey shrike-thrush	-	-
Pachycephalidae	<i>Pachycephala pectoralis</i>	Golden whistler	-	-
Pachycephalidae	<i>Pachycephala rufiventris</i>	Rufous whistler	-	-
Pardalotidae	<i>Pardalotus striatus</i>	Striated pardalote	-	-
Petroicidae	<i>Eopsaltria australis</i>	Eastern yellow robin	-	-
Psittacidae	<i>Alisterus scapularis</i>	Australian king-parrot	-	-
Psittacidae	<i>Trichoglossus haematodus</i>	Rainbow lorikeet	-	-
Rhipiduridae	<i>Rhipidura fuliginosa</i>	Grey fantail	-	-
Rhipiduridae	<i>Rhipidura leucophrys</i>	Willie wagtail	-	-
Timaliidae	<i>Zosterops lateralis</i>	Silveryeye	-	-

¹ EPBC Act: CE – Critically endangered, E – Endangered, V – Vulnerable, MM – Migratory Marine, MT – Migratory Terrestrial Species, MW – Migratory Wetland Species, LM – Listed Marine Species

² NC Act: E – Endangered, V – Vulnerable, SLC – Special Least Concern, (–) Least Concern

APPENDIX B

Microbat Report



Microbat Call Identification Report

Prepared for (“Client”):	Fox & Co Environmental
Survey location/project name:	Wide Bay Wind Farm
Survey dates:	14 February - 26 March 2019
Client project reference:	
Job no.:	FOX-1901
Report date:	24 May 2019

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Methods

Survey summary and data received

Two Song Meter bat detectors (1 x SM2BAT and 1 x SM4-FS) were deployed at 12 sites over a six-week period from 14th February to 26th March 2019. Both detectors recorded in full-spectrum mode, saving data as .WAV files. *Balance! Environmental* received 43,462 .WAV files for analysis.

Bat-call analysis and species identification

Call analyses were performed using the Cluster Analysis function of *Kaleidoscope Pro* (Wildlife Acoustics), which scanned all .WAV files and clustered detected bat-calls into groups with similar pulse-characteristics (based on zero-crossing analysis). All clusters were then manually reviewed in spectrogram view and allocated either to single species or groups of difficult-to-differentiate species (“unresolved calls”).

Manual verification of call identities was based on comparison of call spectrograms and derived metrics with those of reference calls from southern Queensland and/or with published call descriptions (e.g. Reinhold et al. 2001). Consideration was also given to the probability of species’ occurrence based on published distribution information (e.g. Churchill 2008; van Dyck *et al.* 2013) and on-line database records (e.g. <http://www.ala.org.au>).

Reporting standard

The format and content of this report follows Australasian Bat Society standards for the interpretation and reporting of bat call data (Reardon 2003), available on-line at <http://www.ausbats.org.au>.

Species nomenclature follows Jackson & Groves (2015).

Results & Discussion

Most (42,880 = 97%) of the WAV files contained only background noise from insects, rain and wind. The SM4 detector failed to record any bat calls from the site surveyed between 27 February – 4 March. The 7330 WAV files recorded during this period by SM4 were ‘swamped’ with insect calls and/or with rain-generated noise.

Within the 582 WAV files with recognisable bat calls, the Cluster Analysis recognised 607 distinct bat calls and grouped them into 33 clusters. Verification of call identities in those clusters resulted in the aggregation of several clusters that contained call-variants of the same species; while some clusters were further subdivided due to the presence of multiple species’ calls that were obvious to the experienced observer.

Up to 14 species were recorded during these surveys. Eleven call-types were positively identified to ten unique species plus the *Nyctophilus* genus (see **Table 1**). Up to three *Nyctophilus* species potentially occur in the study area – *N. bifax*, *N. geoffroyi* and *N. gouldi* – but their calls cannot be reliably differentiated.

Three other call-types were identifiable only to mixed-species groups because they had variable or intermediate pulse-characteristics. Two of those groups contained species that were otherwise reliably identified (*Chalinolobus gouldii*/*Ozimops ridei* and *C. nigrogriseus*/*Scotorepens greyii*). The third group – *Vespadelus troughtoni*/*Chalinolobus morio* – potentially represented two additional species that was not otherwise recorded. Where these “unresolved calls” were encountered, all members of the relevant group were listed as “probable” in **Table 1** unless positively identifiable calls of one or both species were also observed.

Almost 95% (576) of the calls were positively identified, with 83% (504 calls) attributable to just three species: *C. nigrogriseus*; *O. ridei*; and *Saccolaimus flaviventris*. The numbers of calls attributed to each species and “unresolved” group are presented in **Appendix 1**

Sample spectrograms of all identified call types are shown at **Appendix 2**.

References

- Churchill, S. (2008). *Australian Bats*. Jacana Books, Allen & Unwin; Sydney.
- Jackson, S. and Groves, C. (2015). *Taxonomy of Australian Mammals*. CSIRO Publishing, Melbourne.
- Reardon, T. (2003). Standards in bat detector based surveys. *Australasian Bat Society Newsletter* **20**, 41-43.
- Reinhold, L., Law, B., Ford, G. and Pennay, M. (2001). *Key to the bat calls of south-east Queensland and north-east New South Wales*. Department of Natural Resources and Mines, Brisbane.
- van Dyck, S., Gynther, I. and Baker, A. (ed.) (2013). *Field Companion to the Mammals of Australia*. New Holland; Sydney.

Table 1 Microbat species recorded during the Wide Bay surveys, 14th February – 26th March 2019.

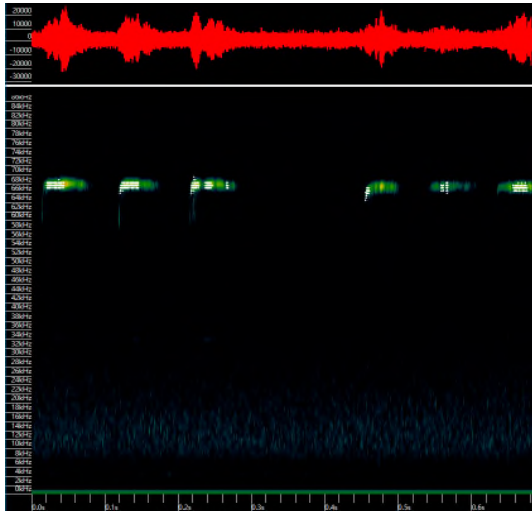
- ◆ = 'definite' - at least one call was attributed unequivocally to the species
- = 'possible' - calls like those of the species were recorded, but were not reliably identified

Deployment dates:	14-20 Feb		20-27 Feb		27 Feb-4 Mar		4-14 Mar		14-20 Mar		20-26 Mar	
Detector:	SM2	SM4	SM2	SM4	SM2	SM4	SM2	SM4	SM2	SM4	SM2	SM4
Species detected												
<i>Rhinolophus megaphyllus</i>					◆	No bats recorded				◆		
<i>Chalinolobus gouldii</i>	◆	◆	◆		◆		◆		◆	◆	◆	◆
<i>Chalinolobus morio</i>			□		□							
<i>Chalinolobus nigrogriseus</i>		◆	◆		◆		◆	◆	◆	◆	◆	◆
<i>Nyctophilus sp.</i>	◆			◆			◆		◆			
<i>Scotorepens greyii</i>			◆		◆		□	□		◆		
<i>Vespadelus troughtoni</i>			□		□							
<i>Miniopterus australis</i>				◆	◆		◆				◆	
<i>Miniopterus orianae</i>			◆		◆		◆				◆	◆
<i>Austronomus australis</i>		◆		◆	◆					◆		◆
<i>Ozimops ridei</i>	◆	◆	□		◆		◆		◆	◆	◆	◆
<i>Ozimops lumsdenae</i>										◆	◆	◆
<i>Saccolaimus flaviventris</i>	◆	◆	◆	◆	◆		◆	◆	◆	◆	◆	◆

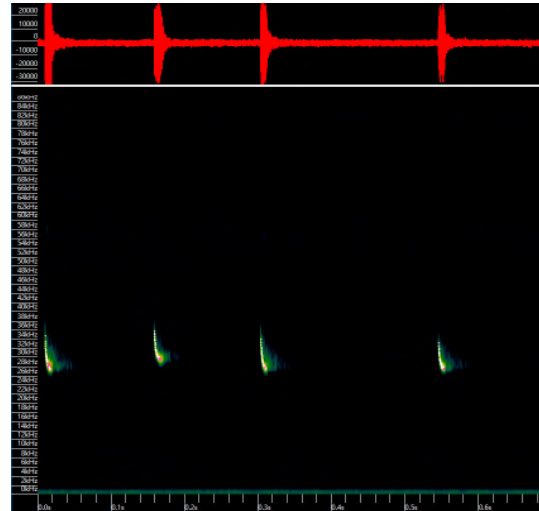
Appendix 1 Numbers of calls attributed to species or unresolved species groups for the Wide bay survey, 14th February – 26th March 2019.

Deployment dates:	14-20 Feb		20-27 Feb		27 Feb-4 Mar		4-14 Mar		14-20 Mar		20-26 Mar		Species total
Detector:	SM2	SM4	SM2	SM4	SM2	SM4	SM2	SM4	SM2	SM4	SM2	SM4	
Positively identified calls													
<i>Rhinolophus megaphyllus</i>					1					3			4
<i>Chalinolobus gouldii</i>	1	3	1		1		1			2	2	6	17
<i>Chalinolobus nigrogriseus</i>		5	12		1		1	1	1	16	10	17	64
<i>Nyctophilus sp.</i>	1			1			1		1				4
<i>Scotorepens greyii</i>			51		1					1			53
<i>Miniopterus australis</i>				4	11		7				1		23
<i>Miniopterus orianae</i>			6		2		4				1	4	17
<i>Austronomus australis</i>		3		1	2					2		1	9
<i>Ozimops ridei</i>	2	7			10		2		1	14	7	116	159
<i>Ozimops lumsdenae</i>										6	1	9	16
<i>Saccolaimus flaviventris</i>	7	29	1	2	17		23	6	4	28	2	91	210
Unresolved calls													
<i>C. gouldii</i> / <i>O. ridei</i>	1		1		1							4	7
<i>C. nigrogriseus</i> / <i>S. greyii</i>		2	10		3		2	1					18
<i>Vespadelus troughtoni</i> / <i>Chalinolobus morio</i>			5		1								6
Site total	12	49	87	8	51		41	8	7	72	24	248	607

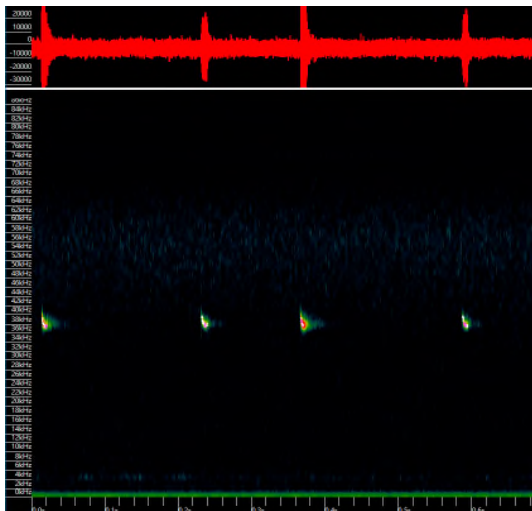
Appendix 2 Representative call sequences from the Wide Bay survey, February-March 2019.
True-time spectrograms; x-axis scale = 20 ms per tick-mark



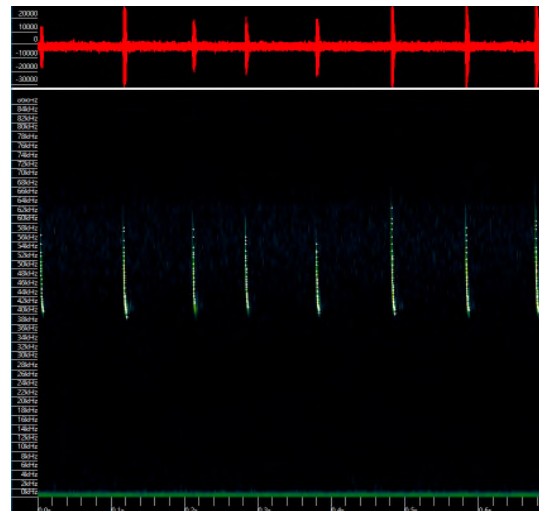
Rhinolophus megaphyllus



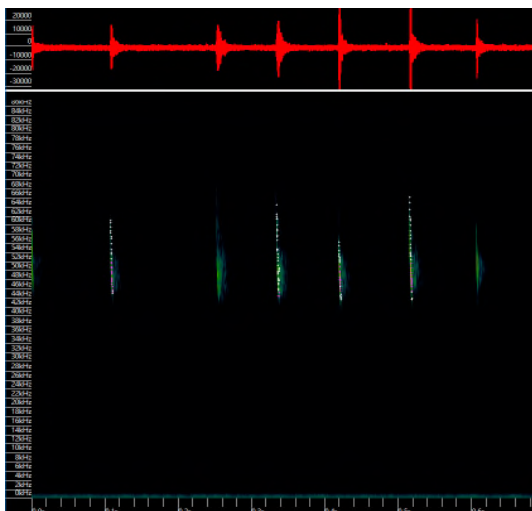
Chalinolobus gouldii



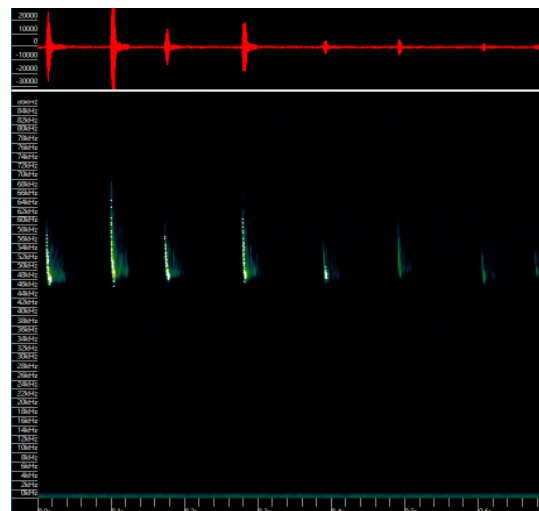
Chalinolobus nigrogriseus



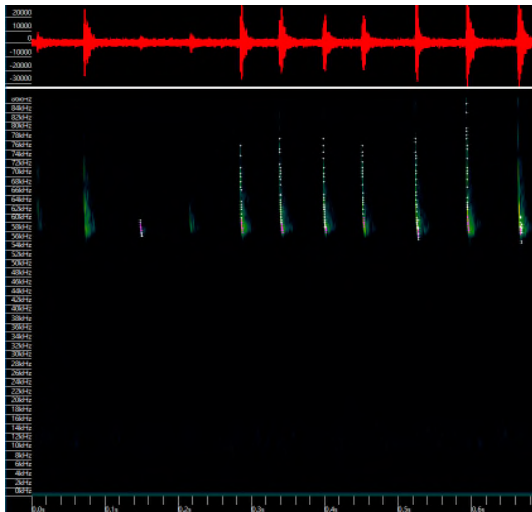
Scotorepens greyii



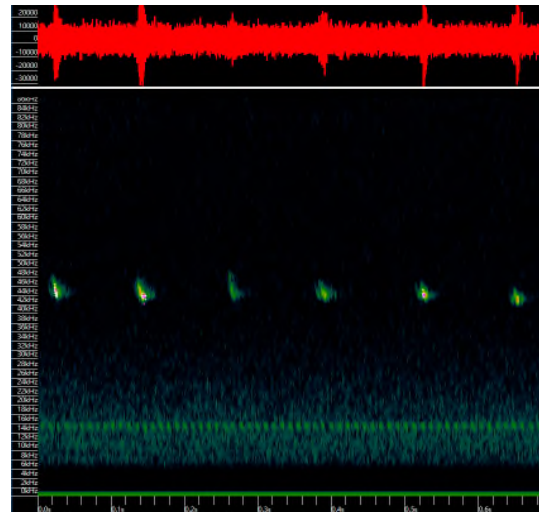
Nyctophilus sp.



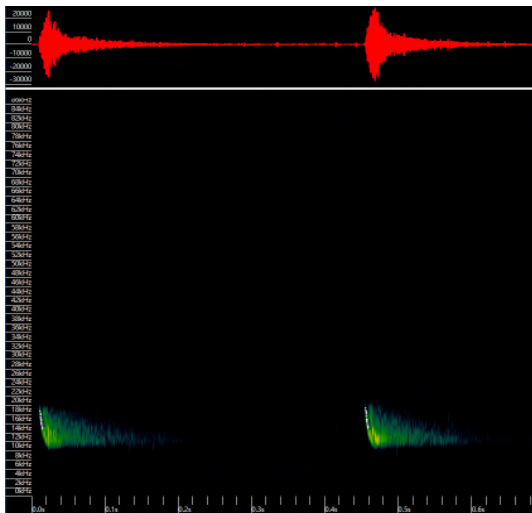
Vespadelus troughtoni / *Chalinolobus morio*



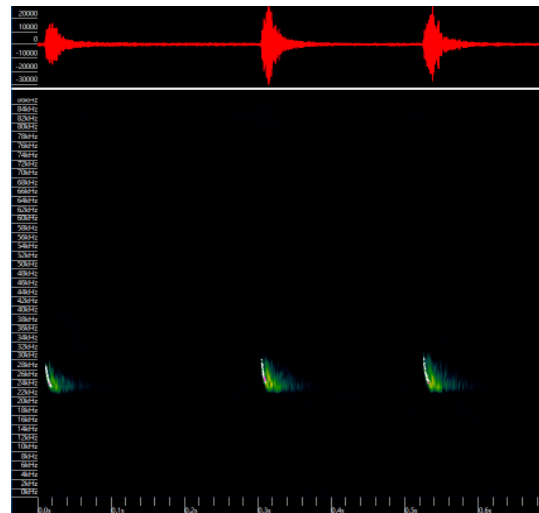
Miniopterus australis



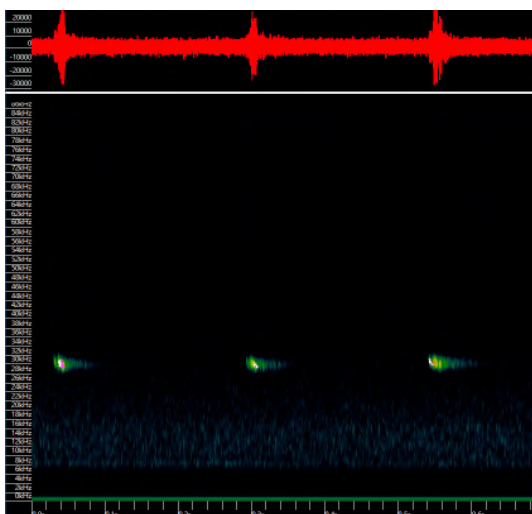
Miniopterus orianae oceanensis



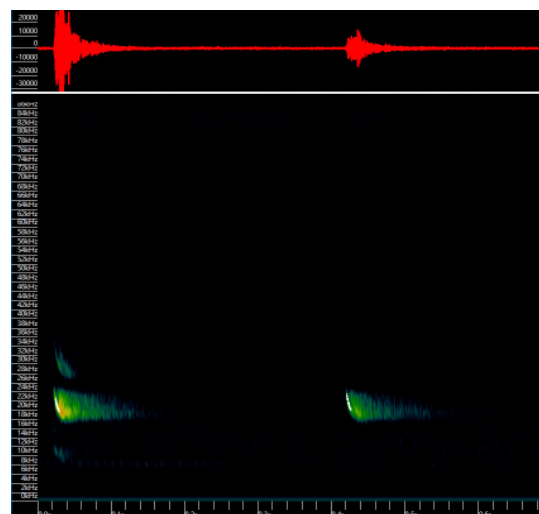
Austronomus australis



Ozimops lumsdenae



Ozimops ridei



Saccolaimus flaviventris

APPENDIX C

Wildlife Online, EPBC PMST Search results

GRC	Local	Priority	Species
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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: 04/09/19 14:59:24

[Summary](#)

[Details](#)

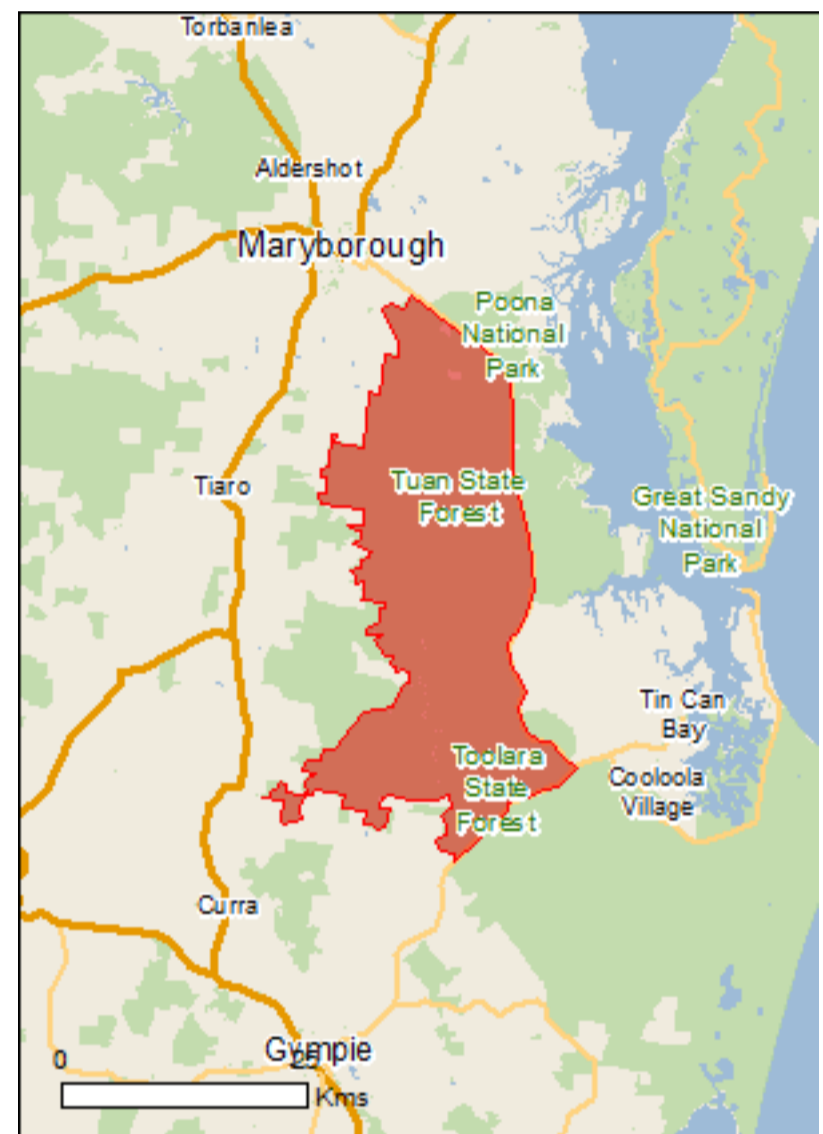
[Matters of NES](#)

[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: 1.0Km



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:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	61
Listed Migratory Species:	33

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:	1
Listed Marine Species:	43
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	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:	2
Regional Forest Agreements:	None
Invasive Species:	40
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)	[Resource Information]
Name	Proximity
Great sandy strait (including great sandy strait, tin can bay and tin can	Within Ramsar site

Listed Threatened Ecological Communities

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
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area

Listed Threatened Species

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour may 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 may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Erythrorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known 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 known 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
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 likely to occur within area
Rostratula australis Australian Painted-snipe, Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Fish		
Maccullochella mariensis Mary River Cod [83806]	Endangered	Species or species habitat known to occur within area
Nannoperca oxleyana Oxleyan Pygmy Perch [64468]	Endangered	Species or species habitat likely to occur within area
Neoceratodus forsteri Australian Lungfish, Queensland Lungfish [67620]	Vulnerable	Species or species habitat known to occur within area
Pseudomugil mellis Honey Blue-eye [26180]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Litoria olongburensis Wallum Sedge Frog [1821]	Vulnerable	Species or species habitat may occur within area
Mixophyes fleayi Fleay's Frog [25960]	Endangered	Species or species habitat may 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

Name	Status	Type of Presence
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	habitat may occur within area Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus hallucatus Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat known 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 may occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	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
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Xeromys myoides Water Mouse, False Water Rat, Yirrkoo [66]	Vulnerable	Species or species habitat known to occur within area
Plants		
Acacia attenuata [10690]	Vulnerable	Species or species habitat known to occur within area
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Baloghia marmorata Marbled Baloghia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat may occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Cossinia australiana Cossinia [3066]	Endangered	Species or species habitat likely to occur within area
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Fontainea rostrata [24039]	Vulnerable	Species or species habitat likely to occur within area
Fontainea venosa [24040]	Vulnerable	Species or species habitat likely to occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
Macadamia ternifolia Small-fruited Queensland Nut, Gympie Nut [7214]	Vulnerable	Species or species habitat likely to occur within area
Macrozamia parcifolia [64682]	Vulnerable	Species or species habitat likely to occur within area
Macrozamia pauli-guilielmi Pineapple Zamia [5712]	Endangered	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat likely to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat known to occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area
Triunia robusta Glossy Spice Bush [14747]	Endangered	Species or species habitat likely to occur within area
Xanthostemon oppositifolius Penda, Southern Penda, Luya's Hardwood [8738]	Vulnerable	Species or species habitat likely to occur within area
Reptiles		
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat known to occur within area
Elusor macrurus Mary River Turtle, Mary River Tortoise [64389]	Endangered	Species or species habitat known to occur within area
Furina dunmalli Dunmall's Snake [59254]	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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Marine Species		
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		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]	Vulnerable	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]		Species or species habitat 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 likely to occur within area
Arenaria interpres Ruddy Turnstone [872]		Species or species habitat known to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat known to occur within area
Calidris alba Sanderling [875]		Species or species habitat known to occur within area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Calidris ruficollis Red-necked Stint [860]		Species or species habitat known to occur within area
Calidris subminuta Long-toed Stint [861]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Calidris tenuirostris Great Knot [862]	Critically Endangered	Species or species habitat known to occur within area
Charadrius bicinctus Double-banded Plover [895]		Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		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 phaeopus Whimbrel [849]		Species or species habitat known to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Tringa brevipes Grey-tailed Tattler [851]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to 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

Defence - TIN CAN BAY TRAINING AREA

Commonwealth Heritage Places

[[Resource Information](#)]

Name

State

Status

Natural

[Wide Bay Military Reserve](#)

QLD

Listed place

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 likely to occur within area

[Anseranas semipalmata](#)

Magpie Goose [978]

Species or species habitat may 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]

Breeding likely to occur within area

[Arenaria interpres](#)

Ruddy Turnstone [872]

Species or species habitat known to occur within area

[Calidris acuminata](#)

Sharp-tailed Sandpiper [874]

Species or species habitat known to occur within area

[Calidris alba](#)

Sanderling [875]

Species or species habitat known to occur within area

[Calidris canutus](#)

Red Knot, Knot [855]

Endangered

Species or species habitat may occur within area

[Calidris ferruginea](#)

Curlew Sandpiper [856]

Critically Endangered

Species or species habitat known to occur within area

[Calidris melanotos](#)

Pectoral Sandpiper [858]

Species or species habitat may occur within area

[Calidris ruficollis](#)

Red-necked Stint [860]

Species or species habitat known to occur within area

[Calidris subminuta](#)

Long-toed Stint [861]

Species or species habitat known to occur within area

[Calidris tenuirostris](#)

Great Knot [862]

Critically Endangered

Species or species

Name	Threatened	Type of Presence
Charadrius bicinctus Double-banded Plover [895]		habitat known to occur within area Species or species habitat known to occur within area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Species or species habitat known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Species or species habitat known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Heteroscelus brevipes Grey-tailed Tattler [59311]		Species or species habitat known to occur within area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area
Limosa limosa Black-tailed Godwit [845]		Species or species habitat known to 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]		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 phaeopus Whimbrel [849]		Species or species habitat known to occur

Name	Threatened	Type of Presence within area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area
Pandion haliaetus Osprey [952]		Species or species habitat likely to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Species or species habitat known to occur within area
Pluvialis squatarola Grey Plover [865]		Species or species habitat known to occur within area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Species or species habitat known 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 known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Species or species habitat known to occur within area
Xenus cinereus Terek Sandpiper [59300]		Species or species habitat known to occur within area

Reptiles

Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat likely to occur within area
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Extra Information

State and Territory Reserves [\[Resource Information \]](#)

Name	State
Poona	QLD
Tinana Creek	QLD

Invasive Species [\[Resource Information \]](#)

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

Name	Status	Type of Presence 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
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
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known 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
Equus caballus Horse [5]		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

Name	Status	Type of Presence
habitat likely to occur within area		
Plants		
<p><i>Annona glabra</i> Pond Apple, Pond-apple Tree, Alligator Apple, Bullock's Heart, Cherimoya, Monkey Apple, Bobwood, Corkwood [6311] <i>Anredera cordifolia</i></p>		Species or species habitat likely to occur within area
<p>Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, <i>Anredera</i>, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643] <i>Asparagus aethiopicus</i></p>		Species or species habitat likely to occur within area
<p><i>Asparagus</i> Fern, Ground <i>Asparagus</i>, Basket Fern, Sprengi's Fern, Bushy <i>Asparagus</i>, Emerald <i>Asparagus</i> [62425] <i>Asparagus africanus</i></p>		Species or species habitat likely to occur within area
<p>Climbing <i>Asparagus</i>, Climbing <i>Asparagus</i> Fern [66907]</p>		Species or species habitat likely to occur within area
<p><i>Asparagus plumosus</i> Climbing <i>Asparagus</i>-fern [48993]</p>		Species or species habitat likely to occur within area
<p><i>Cabomba caroliniana</i> Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] <i>Chrysanthemoides monilifera</i></p>		Species or species habitat likely to occur within area
<p>Bitou Bush, Boneseed [18983]</p>		Species or species habitat may occur within area
<p><i>Chrysanthemoides monilifera</i> subsp. <i>rotundata</i> Bitou Bush [16332]</p>		Species or species habitat likely to occur within area
<p><i>Cryptostegia grandiflora</i> Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913] <i>Dolichandra unguis-cati</i></p>		Species or species habitat likely to occur within area
<p>Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]</p>		Species or species habitat likely to occur within area
<p><i>Eichhornia crassipes</i> Water Hyacinth, Water Orchid, Nile Lily [13466]</p>		Species or species habitat likely to occur within area
<p><i>Hymenachne amplexicaulis</i> <i>Hymenachne</i>, Olive <i>Hymenachne</i>, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]</p>		Species or species habitat likely to occur within area
<p><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>Parthenium hysterophorus</i></p>		Species or species habitat likely to occur within area
<p><i>Parthenium</i> Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]</p>		Species or species habitat likely to occur within area
<p><i>Sagittaria platyphylla</i> Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]</p>		Species or species habitat likely to occur within area
<p><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]</p>		Species or species habitat likely to occur within area
<p><i>Salvinia molesta</i> Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]</p>		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area

Reptiles

Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Nationally Important Wetlands	[Resource Information]
Name	State
Wide Bay Military Training Area C	QLD

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

-25.627227 152.844173,-25.626608 152.844173,-25.675507 152.846233,-25.697783 152.846233,-25.71325 152.846233,-25.766443 152.862712,-25.810339 152.866145,-25.8295 152.859965,-25.844332 152.851726,-25.849894 152.844859,-25.857309 152.842113,-25.864105 152.845546,-25.872137 152.844173,-25.880787 152.852412,-25.893759 152.859279,-25.907966 152.853099,-25.925258 152.859279,-25.934521 152.871638,-25.934521 152.881938,-25.94687 152.893611,-25.957366 152.904597,-25.970948 152.889491,-25.972182 152.885371,-25.977121 152.870265,-25.980824 152.862712,-25.985145 152.843486,-25.991317 152.842799,-26.0123 152.821513,-26.018471 152.8119,-26.033279 152.792674,-26.025875 152.793361,-26.025258 152.780315,-26.016619 152.776881,-26.011683 152.785121,-26.006746 152.786494,-26.001809 152.786494,-25.99934 152.784434,-25.995637 152.781688,-25.990083 152.788554,-25.989465 152.791301,-25.978972 152.788554,-25.98391 152.778941,-25.982059 152.761775,-25.98391 152.759715,-25.98391 152.752162,-25.978972 152.734309,-25.980207 152.728816,-25.990083 152.725383,-25.990083 152.735683,-26.004895 152.729503,-26.006746 152.72195,-26.00366 152.718516,-26.00366 152.710963,-25.991934 152.713023,-25.989465 152.691051,-25.985762 152.691051,-25.978355 152.692424,-25.974034 152.665645,-25.97959 152.664271,-25.978972 152.657405,-25.990083 152.651225,-25.998106 152.653972,-26.000575 152.647105,-26.003043 152.638179,-25.99934 152.634059,-25.98391 152.638179,-25.980207 152.618953,-25.980207 152.624446,-25.977121 152.625819,-25.973417 152.629253,-25.967861 152.635432,-25.969096 152.640239,-25.975886 152.640239,-25.978972 152.654658,-25.976503 152.658092,-25.966627 152.657405,-25.960453 152.665645,-25.957984 152.653972,-25.950575 152.658778,-25.950575 152.672511,-25.940696 152.673884,-25.941931 152.684184,-25.909819 152.710963,-25.906113 152.737743,-25.893142 152.744609,-25.888817 152.748042,-25.886347 152.752849,-25.877698 152.751475,-25.874609 152.746669,-25.877698 152.739802,-25.873991 152.739802,-25.87152 152.734309,-25.865341 152.737056,-25.865341 152.729503,-25.85113 152.721263,-25.846186 152.727443,-25.846186 152.71371,-25.842478 152.712337,-25.838152 152.722636,-25.836298 152.725383,-25.825792 152.72607,-25.825174 152.729503,-25.820847 152.729503,-25.818993 152.708217,-25.815284 152.71165,-25.810339 152.710963,-25.807866 152.710963,-25.803539 152.710277,-25.804776 152.702037,-25.798594 152.70341,-25.793648 152.69929,-25.791793 152.708217,-25.784992 152.708903,-25.783756 152.716457,-25.778809 152.717143,-25.771389 152.70135,-25.767061 152.708903,-25.760259 152.70753,-25.759022 152.69929,-25.75593 152.696544,-25.756548 152.710277,-25.74356 152.71165,-25.739849 152.671138,-25.729334 152.668391,-25.729953 152.676631,-25.717581 152.677318,-25.718199 152.671825,-25.709538 152.672511,-25.70892 152.678691,-25.681695 152.682124,-25.681695 152.686244,-25.689739 152.684184,-25.692833 152.71165,-25.646417 152.716457,-25.648893 152.725383,-25.616082 152.730876,-25.617321 152.741176,-25.606176 152.741862,-25.578308 152.728129,-25.573353 152.738429,-25.577689 152.746669,-25.567779 152.753535,-25.627227 152.844173

Acknowledgements

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

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
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- [-Australian Government, Department of Defence Forestry Corporation, NSW](#)
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- [-Australian Tropical Herbarium, Cairns](#)
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- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

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

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

WildNet Records Species List

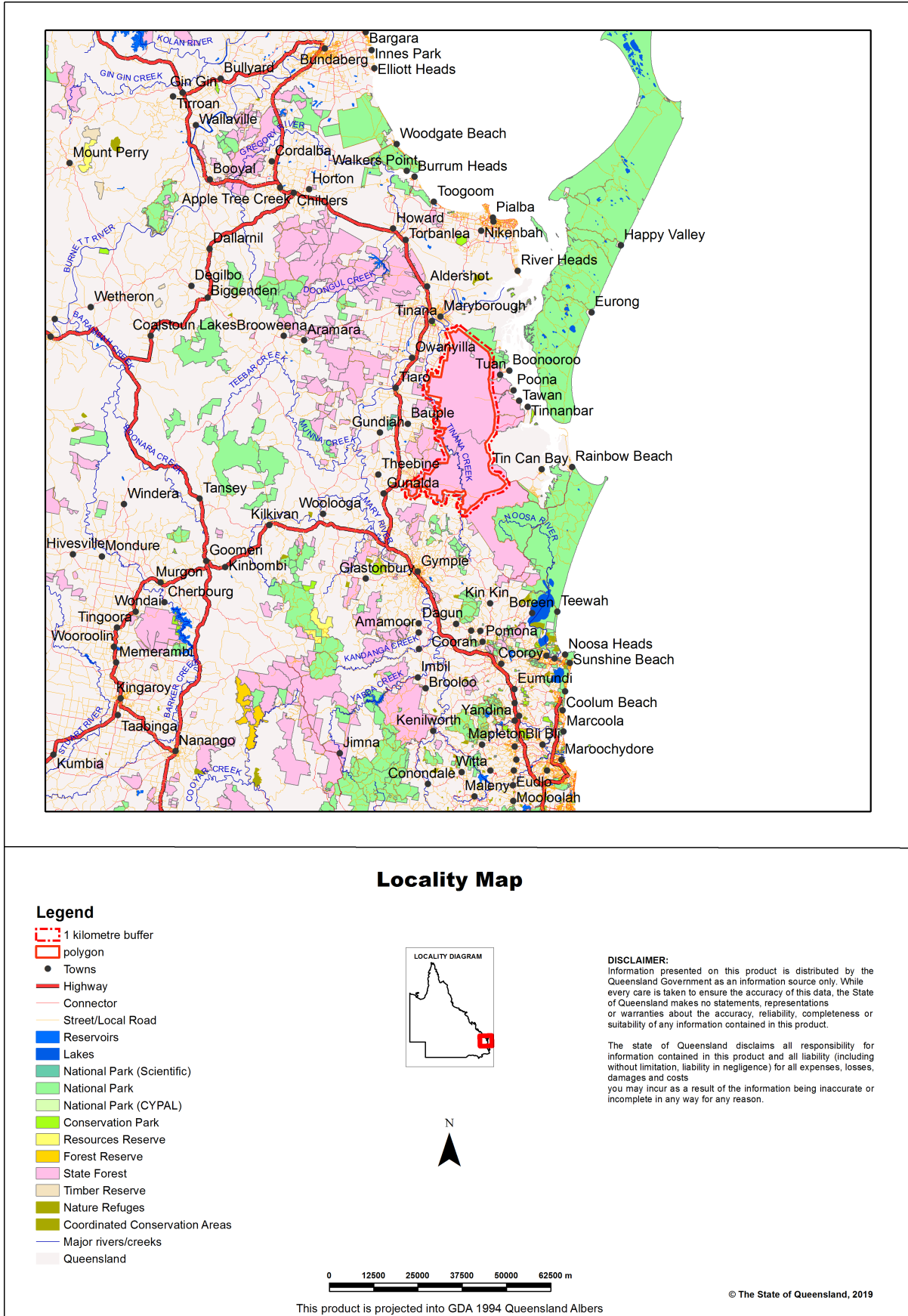


For the selected area of interest 68039.12ha

Current as at 02/09/2019

WildnetFWProject

Map 1. Locality Map



Summary Information

The following table provides an overview of the area of interest .

Table 1. Area of interest details

Size (ha)	68,039.12
Local Government(s)	Gympie Regional, Fraser Coast Regional
Bioregion(s)	Southeast Queensland
Subregion(s)	Great Sandy, Gympie Block, Burnett - Curtis Coastal Lowlands
Catchment(s)	Mary, Noosa

Protected Area(s)

The following estates and/or reserves are located in the area of interest:

Toolara State Forest

Neerdie State Forest 2

Bauple State Forest

Tuan State Forest

Tinana Creek Conservation Park

Poona National Park

World Heritage Area(s)

No World Heritage Areas are located within the area of interest.

Ramsar Area(s)

No Ramsar Areas are located within the area of interest.

Species List

Introduction

This Species List report is derived only from records from the WildNet database managed by the Department of Environment and Science. Other data sources may provide additional information on species occurrence.

The WildNet dataset is constantly being enhanced and the taxonomic and status information revised. If a species does not occur in the report, it does not mean it doesn't occur there and listed species may also no longer inhabit the area.

Table 2 lists the animals recorded within the area of interest and its one kilometre buffer.

Table 3 lists the plants recorded within the area of interest and its one kilometre buffer.

Table 4 lists the fungi recorded within the area of interest and its one kilometre buffer.

Table 5 lists the protists recorded within the area of interest and its one kilometre buffer.

Table 2. Animals recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26910	Actinopterygii	Anguillidae	<i>Anguilla reinhardtii</i>	longfin eel	None	None	0	8	04/02/1993
26941	Actinopterygii	Clupeidae	<i>Nematalosa erebi</i>	bony bream	None	None	0	1	03/02/1993
26952	Actinopterygii	Eleotridae	<i>Gobiomorphus australis</i>	striped gudgeon	None	None	0	1	02/02/1993
18168	Actinopterygii	Eleotridae	<i>Mogurnda adspersa</i>	southern purplespotted gudgeon	None	None	0	3	18/06/2010

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
26968	Actinopterygii	Eleotridae	<i>Philypnodon grandiceps</i>	flathead gudgeon	None	None	0	2	04/02/1993
27024	Actinopterygii	Melanotaeniidae	<i>Melanotaenia duboulayi</i>	crimsonspotted rainbowfish	None	None	0	8	30/09/1994
18169	Actinopterygii	Percichthyidae	<i>Maccullochella mariensis</i>	Mary River cod	None	E	7	9	30/03/2009
18167	Actinopterygii	Percichthyidae	<i>Nannoperca oxleyana</i>	Oxleyan pygmy perch	V	E	0	1	30/09/1994
27054	Actinopterygii	Plotosidae	<i>Tandanus tandanus</i>	freshwater catfish	None	None	0	5	18/06/2010
27059	Actinopterygii	Pseudomugilidae	<i>Pseudomugil signifer</i>	Pacific blue eye	None	None	0	1	30/09/1994
27061	Actinopterygii	Retropinnidae	<i>Retropinna semoni</i>	Australian smelt	None	None	0	1	02/02/1993
716	Amphibia	Bufoidea	<i>Rhinella marina</i>	cane toad	None	None	0	13	01/02/2018
627	Amphibia	Hylidae	<i>Litoria caerulea</i>	common green treefrog	C	None	0	3	02/02/2018
629	Amphibia	Hylidae	<i>Litoria cooloolensis</i>	Cooloola sedgefrog	NT	None	1	1	03/04/1974
608	Amphibia	Hylidae	<i>Litoria fallax</i>	eastern sedgefrog	C	None	0	14	11/02/2018
609	Amphibia	Hylidae	<i>Litoria freycineti</i>	wallum rocketfrog	V	None	0	2	26/02/2009
611	Amphibia	Hylidae	<i>Litoria gracilentata</i>	graceful treefrog	C	None	0	5	24/02/2018
614	Amphibia	Hylidae	<i>Litoria latopalmata</i>	broad palmed rocketfrog	C	None	0	3	02/02/2018
615	Amphibia	Hylidae	<i>Litoria lesueuri sensu lato</i>	stony creek frog	C	None	0	4	03/12/2014
604	Amphibia	Hylidae	<i>Litoria nasuta</i>	striped rocketfrog	C	None	1	7	16/02/2018
596	Amphibia	Hylidae	<i>Litoria peronii</i>	emerald spotted treefrog	C	None	0	2	03/12/2014
600	Amphibia	Hylidae	<i>Litoria rubella</i>	ruddy treefrog	C	None	1	2	01/02/2018
29174	Amphibia	Hylidae	<i>Litoria wilcoxii</i>	eastern stony creek frog	C	None	0	10	12/02/2018
706	Amphibia	Limnodynastidae	<i>Adelotus brevis</i>	tusked frog	V	None	0	1	03/12/2014
681	Amphibia	Limnodynastidae	<i>Limnodynastes peronii</i>	striped marshfrog	C	None	0	13	25/02/2018
684	Amphibia	Limnodynastidae	<i>Limnodynastes tasmaniensis</i>	spotted grassfrog	C	None	0	24	08/02/2002
673	Amphibia	Limnodynastidae	<i>Limnodynastes terraereginae</i>	scarlet sided pobblebonk	C	None	0	2	03/02/2018
696	Amphibia	Myobatrachidae	<i>Crinia parinsignifera</i>	beeping froglet	C	None	0	3	25/03/2010
698	Amphibia	Myobatrachidae	<i>Crinia signifera</i>	clicking froglet	C	None	0	4	07/04/2009
686	Amphibia	Myobatrachidae	<i>Crinia tinnula</i>	wallum froglet	V	None	3	27	24/02/2018
676	Amphibia	Myobatrachidae	<i>Mixophyes iteratus</i>	giant barred frog	E	E	0	4	03/12/2014
661	Amphibia	Myobatrachidae	<i>Pseudophryne raveni</i>	copper backed broodfrog	C	None	0	4	25/03/2010
633	Amphibia	Myobatrachidae	<i>Uperoleia fusca</i>	dusky gungan	C	None	0	2	08/11/2008

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
640	Amphibia	Myobatrachidae	<i>Uperoleia sp.</i>	None	None	None	1	1	12/12/1977
1423	Aves	Acanthizidae	<i>Acanthiza pusilla</i>	brown thornbill	C	None	0	10	21/01/2007
1408	Aves	Acanthizidae	<i>Gerygone levigaster</i>	mangrove gerygone	C	None	0	1	19/09/1971
1410	Aves	Acanthizidae	<i>Gerygone mouki</i>	brown gerygone	C	None	0	13	06/05/2007
1396	Aves	Acanthizidae	<i>Gerygone olivacea</i>	white-throated gerygone	C	None	0	24	06/05/2007
1397	Aves	Acanthizidae	<i>Gerygone palpebrosa</i>	fairy gerygone	C	None	0	1	06/03/2001
1382	Aves	Acanthizidae	<i>Sericornis frontalis</i>	white-browed scrubwren	C	None	0	17	06/05/2007
1384	Aves	Acanthizidae	<i>Sericornis magnirostra</i>	large-billed scrubwren	C	None	0	5	11/02/2007
1371	Aves	Acanthizidae	<i>Smicromis brevirostris</i>	weebill	C	None	0	3	22/02/1995
1729	Aves	Accipitridae	<i>Accipiter fasciatus</i>	brown goshawk	C	None	0	2	26/03/2006
1730	Aves	Accipitridae	<i>Accipiter novaehollandiae</i>	grey goshawk	C	None	0	2	30/07/2006
1732	Aves	Accipitridae	<i>Aquila audax</i>	wedge-tailed eagle	C	None	0	6	22/02/1995
1721	Aves	Accipitridae	<i>Aviceda subcristata</i>	Pacific baza	C	None	0	9	09/04/2006
1722	Aves	Accipitridae	<i>Circus approximans</i>	swamp harrier	C	None	0	1	29/09/2001
1723	Aves	Accipitridae	<i>Circus assimilis</i>	spotted harrier	C	None	0	1	03/06/2002
1725	Aves	Accipitridae	<i>Elanus axillaris</i>	black-shouldered kite	C	None	0	2	31/12/1974
1720	Aves	Accipitridae	<i>Haliastur indus</i>	brahminy kite	C	None	0	1	19/09/1971
1707	Aves	Accipitridae	<i>Haliastur sphenurus</i>	whistling kite	C	None	0	5	19/08/2001
1710	Aves	Accipitridae	<i>Hieraaetus morphnoides</i>	little eagle	C	None	0	1	31/07/1994
1712	Aves	Accipitridae	<i>Lophoictinia isura</i>	square-tailed kite	C	None	0	2	28/12/2013
1702	Aves	Accipitridae	<i>Pandion cristatus</i>	eastern osprey	SL	None	0	1	19/09/1971
1305	Aves	Acrocephalidae	<i>Acrocephalus australis</i>	Australian reed-warbler	C	None	0	2	19/09/2000
1973	Aves	Aegothelidae	<i>Aegotheles cristatus</i>	Australian owl-nightjar	C	None	0	3	29/09/2001
1776	Aves	Alcedinidae	<i>Ceyx azureus</i>	azure kingfisher	C	None	0	10	06/05/2007
1992	Aves	Anatidae	<i>Anas castanea</i>	chestnut teal	C	None	0	1	19/09/1971
1993	Aves	Anatidae	<i>Anas gracilis</i>	grey teal	C	None	0	1	10/11/2007
1998	Aves	Anatidae	<i>Anas superciliosa</i>	Pacific black duck	C	None	0	12	10/11/2007
1999	Aves	Anatidae	<i>Aythya australis</i>	hardhead	C	None	0	1	10/11/2007
2003	Aves	Anatidae	<i>Chenonetta jubata</i>	Australian wood duck	C	None	0	10	06/05/2007
1279	Aves	Anhingidae	<i>Anhinga novaehollandiae</i>	Australasian darter	C	None	0	2	10/11/2007
1963	Aves	Anseranatidae	<i>Anseranas semipalmata</i>	magpie goose	C	None	0	1	10/11/2007

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1829	Aves	Ardeidae	<i>Ardea alba modesta</i>	eastern great egret	C	None	0	3	19/09/2000
1831	Aves	Ardeidae	<i>Ardea intermedia</i>	intermediate egret	C	None	0	2	10/11/2007
1832	Aves	Ardeidae	<i>Ardea pacifica</i>	white-necked heron	C	None	0	3	09/03/2001
1830	Aves	Ardeidae	<i>Bubulcus ibis</i>	cattle egret	C	None	0	1	19/09/2000
1840	Aves	Ardeidae	<i>Egretta garzetta</i>	little egret	C	None	0	1	19/09/1971
1826	Aves	Ardeidae	<i>Egretta novaehollandiae</i>	white-faced heron	C	None	0	9	08/04/2007
1818	Aves	Ardeidae	<i>Nycticorax caledonicus</i>	nankeen night-heron	C	None	0	1	04/02/2007
1659	Aves	Artamidae	<i>Artamus cyanopterus</i>	dusky woodswallow	C	None	0	1	31/12/1974
1660	Aves	Artamidae	<i>Artamus leucorhynchus</i>	white-breasted woodswallow	C	None	0	2	10/11/2007
1646	Aves	Artamidae	<i>Artamus minor</i>	little woodswallow	C	None	0	1	26/04/1971
1649	Aves	Artamidae	<i>Artamus superciliosus</i>	white-browed woodswallow	C	None	0	1	31/12/1974
1654	Aves	Artamidae	<i>Cracticus nigrogularis</i>	pied butcherbird	C	None	0	19	25/03/2007
1644	Aves	Artamidae	<i>Cracticus tibicen</i>	Australian magpie	C	None	0	31	06/05/2007
1656	Aves	Artamidae	<i>Cracticus torquatus</i>	grey butcherbird	C	None	0	21	06/05/2007
1645	Aves	Artamidae	<i>Strepera graculina</i>	pied currawong	C	None	0	20	06/05/2007
1956	Aves	Burhinidae	<i>Burhinus grallarius</i>	bush stone-curlew	C	None	0	2	07/04/2009
1191	Aves	Cacatuidae	<i>Cacatua galerita</i>	sulphur-crested cockatoo	C	None	0	18	06/05/2007
1196	Aves	Cacatuidae	<i>Calyptorhynchus banksii</i>	red-tailed black-cockatoo	C	None	0	2	19/09/1971
1185	Aves	Cacatuidae	<i>Calyptorhynchus funereus</i>	yellow-tailed black-cockatoo	C	None	0	17	08/04/2007
1171	Aves	Cacatuidae	<i>Calyptorhynchus lathami</i>	glossy black-cockatoo	V	None	0	1	21/08/2001
1193	Aves	Cacatuidae	<i>Eolophus roseicapilla</i>	galah	C	None	0	23	06/05/2007
1636	Aves	Campephagidae	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike	C	None	0	27	06/05/2007
1637	Aves	Campephagidae	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike	C	None	0	9	29/09/2001
1639	Aves	Campephagidae	<i>Coracina tenuirostris</i>	cidabird	C	None	0	9	04/02/2007
1640	Aves	Campephagidae	<i>Lalage leucomela</i>	varied triller	C	None	0	3	01/04/2007
1642	Aves	Campephagidae	<i>Lalage tricolor</i>	white-winged triller	C	None	0	1	31/12/1974
1089	Aves	Casuariidae	<i>Dromaius novaehollandiae</i>	emu	C	None	0	8	21/04/2001
1940	Aves	Charadriidae	<i>Elsayornis melanops</i>	black-fronted dotterel	C	None	0	1	31/12/1974
27774	Aves	Charadriidae	<i>Vanellus miles</i>	masked lapwing	C	None	0	3	10/11/2007

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1933	Aves	Charadriidae	<i>Vanellus miles novaehollandiae</i>	masked lapwing (southern subspecies)	C	None	0	4	19/09/2000
1294	Aves	Cisticolidae	<i>Cisticola exilis</i>	golden-headed cisticola	C	None	0	6	14/01/2007
1628	Aves	Climacteridae	<i>Climacteris picumnus</i>	brown treecreeper	C	None	0	2	31/07/1994
1617	Aves	Climacteridae	<i>Cormobates leucophaea</i>	white-throated treecreeper	C	None	0	6	08/04/2007
18293	Aves	Climacteridae	<i>Cormobates leucophaea metastasis</i>	white-throated treecreeper (southern)	C	None	0	16	21/08/2001
1803	Aves	Columbidae	<i>Columba leucomela</i>	white-headed pigeon	C	None	0	3	25/03/2007
1810	Aves	Columbidae	<i>Geopelia humeralis</i>	bar-shouldered dove	C	None	0	17	06/05/2007
1797	Aves	Columbidae	<i>Geopelia striata</i>	peaceful dove	C	None	0	15	12/03/2001
1787	Aves	Columbidae	<i>Leucosarcia melanoleuca</i>	wonga pigeon	C	None	0	9	06/05/2007
1789	Aves	Columbidae	<i>Lopholaimus antarcticus</i>	topknot pigeon	C	None	0	2	05/11/2005
1791	Aves	Columbidae	<i>Macropygia amboinensis</i>	brown cuckoo-dove	C	None	0	15	06/05/2007
1793	Aves	Columbidae	<i>Ocyphaps lophotes</i>	crested pigeon	C	None	0	9	06/05/2007
1774	Aves	Columbidae	<i>Streptopelia chinensis</i>	spotted dove	None	None	0	13	06/05/2007
1779	Aves	Coraciidae	<i>Eurystomus orientalis</i>	dollarbird	C	None	0	15	25/03/2007
1603	Aves	Corcoracidae	<i>Corcorax melanorhamphos</i>	white-winged chough	C	None	0	6	22/02/1995
1609	Aves	Corvidae	<i>Corvus orru</i>	Torresian crow	C	None	0	51	10/11/2007
1754	Aves	Cuculidae	<i>Cacomantis flabelliformis</i>	fan-tailed cuckoo	C	None	0	14	01/04/2007
1750	Aves	Cuculidae	<i>Cacomantis pallidus</i>	pallid cuckoo	C	None	0	2	29/09/2001
1743	Aves	Cuculidae	<i>Cacomantis variolosus</i>	brush cuckoo	C	None	0	9	01/07/2006
1751	Aves	Cuculidae	<i>Centropus phasianinus</i>	pheasant coucal	C	None	0	10	28/01/2006
1744	Aves	Cuculidae	<i>Chalcites basalus</i>	Horsfield's bronze-cuckoo	C	None	0	7	14/01/2007
1745	Aves	Cuculidae	<i>Chalcites lucidus</i>	shining bronze-cuckoo	C	None	0	8	06/05/2007
1756	Aves	Cuculidae	<i>Chalcites minutillus barnardi</i>	Eastern little bronze-cuckoo	C	None	0	1	02/12/2000
1738	Aves	Cuculidae	<i>Eudynamis orientalis</i>	eastern koel	C	None	0	5	23/04/2006
1740	Aves	Cuculidae	<i>Scythrops novaehollandiae</i>	channel-billed cuckoo	C	None	0	6	14/01/2007
1601	Aves	Dicruridae	<i>Dicrurus bracteatus</i>	spangled drongo	C	None	0	30	06/05/2007

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1366	Aves	Estrildidae	<i>Lonchura castaneothorax</i>	chestnut-breasted mannikin	C	None	0	6	28/01/2007
1359	Aves	Estrildidae	<i>Neochmia temporalis</i>	red-browed finch	C	None	0	17	08/04/2007
1342	Aves	Estrildidae	<i>Taeniopygia bichenovii</i>	double-barred finch	C	None	0	8	19/09/2000
1949	Aves	Eurostopodidae	<i>Eurostopodus mystacalis</i>	white-throated nightjar	C	None	0	2	04/11/2008
1716	Aves	Falconidae	<i>Falco berigora</i>	brown falcon	C	None	0	2	28/02/2001
1704	Aves	Falconidae	<i>Falco cenchroides</i>	nankeen kestrel	C	None	0	2	19/09/1971
1678	Aves	Gruidae	<i>Grus rubicunda</i>	brolga	C	None	0	1	26/08/1956
1767	Aves	Halcyonidae	<i>Dacelo novaeguineae</i>	laughing kookaburra	C	None	0	40	18/02/2007
1760	Aves	Halcyonidae	<i>Todiramphus macleayii</i>	forest kingfisher	C	None	0	15	01/04/2007
1761	Aves	Halcyonidae	<i>Todiramphus pyrrhopygius</i>	red-backed kingfisher	C	None	0	1	31/12/1974
1762	Aves	Halcyonidae	<i>Todiramphus sanctus</i>	sacred kingfisher	C	None	0	7	10/12/2006
1572	Aves	Hirundinidae	<i>Hirundo neoxena</i>	welcome swallow	C	None	0	22	10/11/2007
1585	Aves	Hirundinidae	<i>Petrochelidon ariel</i>	fairy martin	C	None	0	5	10/11/2007
1573	Aves	Hirundinidae	<i>Petrochelidon nigricans</i>	tree martin	C	None	0	7	08/04/2007
1928	Aves	Jacaniidae	<i>Irediparra gallinacea</i>	comb-crested jacana	C	None	0	3	10/11/2007
1896	Aves	Laridae	<i>Hydroprogne caspia</i>	Caspian tern	SL	None	0	1	19/09/1971
1556	Aves	Maluridae	<i>Malurus lamberti</i>	variegated fairy-wren	C	None	0	9	15/10/2006
1558	Aves	Maluridae	<i>Malurus melanocephalus</i>	red-backed fairy-wren	C	None	0	27	06/05/2007
1289	Aves	Megaluridae	<i>Megalurus timoriensis</i>	tawny grassbird	C	None	0	2	19/09/2000
1694	Aves	Megapodiidae	<i>Alectura lathamii</i>	Australian brush-turkey	C	None	0	1	06/03/2001
1542	Aves	Meliphagidae	<i>Anthochaera chrysoptera</i>	little wattlebird	C	None	0	16	15/10/2006
1523	Aves	Meliphagidae	<i>Caligavis chrysops</i>	yellow-faced honeyeater	C	None	0	20	06/05/2007
1539	Aves	Meliphagidae	<i>Entomyzon cyanotis</i>	blue-faced honeyeater	C	None	0	21	08/04/2007
1517	Aves	Meliphagidae	<i>Lichenostomus melanops</i>	yellow-tufted honeyeater	C	None	0	3	29/09/2001
1497	Aves	Meliphagidae	<i>Lichmera indistincta</i>	brown honeyeater	C	None	0	25	08/04/2007
1500	Aves	Meliphagidae	<i>Manorina melanocephala</i>	noisy miner	C	None	0	24	18/02/2007
1504	Aves	Meliphagidae	<i>Meliphaga lewinii</i>	Lewin's honeyeater	C	None	0	50	06/05/2007
1507	Aves	Meliphagidae	<i>Melithreptus albugularis</i>	white-throated honeyeater	C	None	0	40	06/05/2007

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1483	Aves	Meliphagidae	<i>Melithreptus gularis</i>	black-chinned honeyeater	C	None	0	3	22/02/1995
1485	Aves	Meliphagidae	<i>Melithreptus lunatus</i>	white-naped honeyeater	C	None	0	3	12/03/2001
1488	Aves	Meliphagidae	<i>Myzomela obscura</i>	dusky honeyeater	C	None	0	1	19/09/2000
1489	Aves	Meliphagidae	<i>Myzomela sanguinolenta</i>	scarlet honeyeater	C	None	0	28	01/04/2007
1493	Aves	Meliphagidae	<i>Philemon citreogularis</i>	little friarbird	C	None	0	19	28/01/2007
1494	Aves	Meliphagidae	<i>Philemon corniculatus</i>	noisy friarbird	C	None	0	45	06/05/2007
1482	Aves	Meliphagidae	<i>Phylidonyris niger</i>	white-cheeked honeyeater	C	None	0	10	29/09/2001
1471	Aves	Meliphagidae	<i>Plectorhyncha lanceolata</i>	striped honeyeater	C	None	0	3	22/02/1995
1513	Aves	Meliphagidae	<i>Ptilotula fusca</i>	fuscous honeyeater	C	None	0	1	31/07/1994
1764	Aves	Meropidae	<i>Merops ornatus</i>	rainbow bee-eater	C	None	0	29	06/05/2007
1594	Aves	Monarchidae	<i>Carterornis leucotis</i>	white-eared monarch	C	None	0	1	06/03/2001
1589	Aves	Monarchidae	<i>Grallina cyanoleuca</i>	magpie-lark	C	None	0	29	10/11/2007
1595	Aves	Monarchidae	<i>Monarcha melanopsis</i>	black-faced monarch	SL	None	0	3	22/10/2005
1599	Aves	Monarchidae	<i>Myiagra cyanoleuca</i>	satin flycatcher	SL	None	0	1	31/12/1974
1600	Aves	Monarchidae	<i>Myiagra inquieta</i>	restless flycatcher	C	None	0	10	25/03/2007
1586	Aves	Monarchidae	<i>Myiagra rubecula</i>	leaden flycatcher	C	None	0	26	01/04/2007
1597	Aves	Monarchidae	<i>Symposiachrus trivirgatus</i>	spectacled monarch	SL	None	0	8	08/04/2007
1455	Aves	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian pipit	C	None	0	5	06/03/1995
1611	Aves	Nectariniidae	<i>Dicaeum hirundinaceum</i>	mistletoebird	C	None	0	21	08/04/2007
1453	Aves	Neosittidae	<i>Daphoenositta chrysoptera</i>	varied sittella	C	None	0	4	22/02/1995
1442	Aves	Oriolidae	<i>Oriolus sagittatus</i>	olive-backed oriole	C	None	0	19	18/02/2007
1444	Aves	Oriolidae	<i>Sphecotheres vieilloti</i>	Australasian figbird	C	None	0	35	06/05/2007
1449	Aves	Pachycephalidae	<i>Colluricincla harmonica</i>	grey shrike-thrush	C	None	0	27	06/05/2007
1450	Aves	Pachycephalidae	<i>Colluricincla megarhyncha</i>	little shrike-thrush	C	None	0	12	25/03/2007
1436	Aves	Pachycephalidae	<i>Pachycephala pectoralis</i>	golden whistler	C	None	0	37	06/05/2007
1437	Aves	Pachycephalidae	<i>Pachycephala rufiventris</i>	rufous whistler	C	None	0	22	18/06/2006
1389	Aves	Pardalotidae	<i>Pardalotus punctatus</i>	spotted pardalote	C	None	0	15	08/04/2007
1392	Aves	Pardalotidae	<i>Pardalotus striatus</i>	striated pardalote	C	None	0	36	06/05/2007

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1360	Aves	Passeridae	<i>Passer domesticus</i>	house sparrow	None	None	0	2	30/09/1978
1284	Aves	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian pelican	C	None	0	3	12/08/1999
1347	Aves	Petroicidae	<i>Eopsaltria australis</i>	eastern yellow robin	C	None	0	27	04/02/2007
1339	Aves	Petroicidae	<i>Microeca fascians</i>	jacky winter	C	None	0	8	06/03/1995
1332	Aves	Petroicidae	<i>Petroica rosea</i>	rose robin	C	None	0	2	30/07/2006
1261	Aves	Phalacrocoracidae	<i>Microcarbo melanoleucos</i>	little pied cormorant	C	None	0	8	14/01/2007
1263	Aves	Phalacrocoracidae	<i>Phalacrocorax sulcirostris</i>	little black cormorant	C	None	0	8	10/11/2007
1264	Aves	Phalacrocoracidae	<i>Phalacrocorax varius</i>	pied cormorant	C	None	0	2	06/03/2001
1687	Aves	Phasianidae	<i>Coturnix ypsilophora</i>	brown quail	C	None	0	3	19/09/2000
1955	Aves	Podargidae	<i>Podargus strigoides</i>	tawny frogmouth	C	None	0	3	03/12/2014
1271	Aves	Podicipedidae	<i>Podiceps cristatus</i>	great crested grebe	C	None	0	1	10/11/2007
1260	Aves	Podicipedidae	<i>Polyocephalus polyocephalus</i>	hoary-headed grebe	C	None	0	1	19/09/2000
1249	Aves	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian grebe	C	None	0	3	10/11/2007
1318	Aves	Pomatostomidae	<i>Pomatostomus temporalis</i>	grey-crowned babbler	C	None	0	7	06/03/1995
1180	Aves	Psittacidae	<i>Alisterus scapularis</i>	Australian king-parrot	C	None	0	5	06/05/2007
1182	Aves	Psittacidae	<i>Aprosmictus erythropterus</i>	red-winged parrot	C	None	0	1	31/01/1978
1147	Aves	Psittacidae	<i>Parvipsitta pusilla</i>	little lorikeet	C	None	0	8	30/04/2006
1135	Aves	Psittacidae	<i>Pezoporus wallicus wallicus</i>	ground parrot	V	None	0	4	31/12/1984
1136	Aves	Psittacidae	<i>Platycercus adscitus</i>	pale-headed rosella	C	None	0	13	06/05/2007
1124	Aves	Psittacidae	<i>Trichoglossus chlorolepidotus</i>	scaly-breasted lorikeet	C	None	0	18	25/03/2007
1125	Aves	Psittacidae	<i>Trichoglossus haematodus moluccanus</i>	rainbow lorikeet	C	None	0	56	06/05/2007
1623	Aves	Psophodidae	<i>Psophodes olivaceus</i>	eastern whipbird	C	None	0	26	08/04/2007
1177	Aves	Ptilonorhynchidae	<i>Ailuroedus crassirostris</i>	green catbird	C	None	0	1	09/04/2006
1686	Aves	Rallidae	<i>Fulica atra</i>	Eurasian coot	C	None	0	2	10/11/2007
1673	Aves	Rallidae	<i>Gallinula tenebrosa</i>	dusky moorhen	C	None	0	2	19/09/2000
1662	Aves	Rallidae	<i>Porphyrio melanotus</i>	purple swamphen	C	None	0	3	10/11/2007
1893	Aves	Recurvirostridae	<i>Himantopus himantopus</i>	black-winged stilt	C	None	0	1	10/11/2007

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
1575	Aves	Rhipiduridae	<i>Rhipidura albiscapa</i>	grey fantail	C	None	0	29	06/05/2007
1576	Aves	Rhipiduridae	<i>Rhipidura leucophrys</i>	willie wagtail	C	None	0	24	10/11/2007
1578	Aves	Rhipiduridae	<i>Rhipidura rufifrons</i>	rufous fantail	SL	None	0	11	11/02/2007
1883	Aves	Rostratulidae	<i>Rostratula australis</i>	Australian painted snipe	V	E	0	1	10/11/2007
1857	Aves	Scolopacidae	<i>Gallinago hardwickii</i>	Latham's snipe	SL	None	0	2	10/11/2007
1102	Aves	Strigidae	<i>Ninox boobook</i>	southern boobook	C	None	0	7	03/12/2014
1107	Aves	Strigidae	<i>Ninox strenua</i>	powerful owl	V	None	0	3	10/10/2010
1303	Aves	Sturnidae	<i>Sturnus vulgaris</i>	common starling	None	None	0	1	19/09/1971
1822	Aves	Threskiornithidae	<i>Platalea flavipes</i>	yellow-billed spoonbill	C	None	0	2	10/11/2007
1823	Aves	Threskiornithidae	<i>Platalea regia</i>	royal spoonbill	C	None	0	2	19/09/2000
1825	Aves	Threskiornithidae	<i>Plegadis falcinellus</i>	glossy ibis	SL	None	0	1	19/09/1971
1812	Aves	Threskiornithidae	<i>Threskiornis molucca</i>	Australian white ibis	C	None	0	11	06/05/2007
1800	Aves	Threskiornithidae	<i>Threskiornis spinicollis</i>	straw-necked ibis	C	None	0	1	19/08/2001
1276	Aves	Timaliidae	<i>Zosterops lateralis</i>	silveryeye	C	None	0	19	25/03/2007
1082	Aves	Turnicidae	<i>Turnix velox</i>	little button-quail	C	None	0	1	06/05/2007
1109	Aves	Tytonidae	<i>Tyto longimembris</i>	eastern grass owl	C	None	0	1	26/08/1956
19149	Insecta	Nymphalidae	<i>Acraea andromacha andromacha</i>	glasswing	None	None	0	1	02/12/2000
19133	Insecta	Nymphalidae	<i>Hypocysta adiante adiante</i>	orange ringlet	None	None	0	1	02/12/2000
19110	Insecta	Pieridae	<i>Belenois java teutonia</i>	caper white	None	None	0	1	02/12/2000
1067	Mammalia	Canidae	<i>Canis lupus familiaris</i>	dog	None	None	0	1	03/01/1978
803	Mammalia	Dasyuridae	<i>Dasyurus maculatus maculatus</i>	spotted-tailed quoll (southern subspecies)	V	E	0	1	31/12/1946
811	Mammalia	Dasyuridae	<i>Planigale maculata</i>	common planigale	C	None	9	12	04/04/1979
714	Mammalia	Dugongidae	<i>Dugong dugon</i>	dugong	V	None	0	1	14/09/1997
1006	Mammalia	Emballonuridae	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tail bat	C	None	1	2	06/04/1978
901	Mammalia	Macropodidae	<i>Macropus giganteus</i>	eastern grey kangaroo	C	None	0	3	19/12/1980
904	Mammalia	Macropodidae	<i>Macropus rufogriseus</i>	red-necked wallaby	C	None	0	2	22/02/1995
885	Mammalia	Macropodidae	<i>Wallabia bicolor</i>	swamp wallaby	C	None	0	2	22/03/1979
954	Mammalia	Miniopteridae	<i>Miniopterus australis</i>	little bent-wing bat	C	None	0	1	03/12/2014
22061	Mammalia	Molossidae	<i>Mormopterus ridei</i>	eastern free-tailed bat	C	None	0	1	19/02/2009

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
772	Mammalia	Muridae	<i>Melomys burtoni</i>	grassland melomys	C	None	0	2	23/03/1979
759	Mammalia	Muridae	<i>Melomys cervinipes</i>	fawn-footed melomys	C	None	0	1	04/11/2002
761	Mammalia	Muridae	<i>Melomys sp.</i>	None	None	None	0	1	10/10/2010
764	Mammalia	Muridae	<i>Mus musculus</i>	house mouse	None	None	11	16	05/04/1979
741	Mammalia	Muridae	<i>Rattus fuscipes</i>	bush rat	C	None	0	1	10/10/2010
734	Mammalia	Muridae	<i>Rattus tunneyi</i>	pale field-rat	C	None	1	2	05/04/1979
724	Mammalia	Muridae	<i>Xeromys myoides</i>	water mouse	V	V	0	1	08/04/1999
836	Mammalia	Ornithorhynchidae	<i>Ornithorhynchus anatinus</i>	platypus	SL	None	0	2	31/12/2002
784	Mammalia	Peramelidae	<i>Isoodon macrourus</i>	northern brown bandicoot	C	None	0	1	02/07/1976
879	Mammalia	Petauridae	<i>Petaurus norfolcensis</i>	squirrel glider	C	None	0	2	04/11/2008
860	Mammalia	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala	V	V	0	8	17/11/2018
1080	Mammalia	Suidae	<i>Sus scrofa</i>	pig	None	None	0	1	17/12/1980
838	Mammalia	Tachyglossidae	<i>Tachyglossus aculeatus</i>	short-beaked echidna	SL	None	0	1	10/10/2010
972	Mammalia	Vespertilionidae	<i>Chalinolobus gouldii</i>	Gould's wattled bat	C	None	0	2	03/12/2014
973	Mammalia	Vespertilionidae	<i>Chalinolobus morio</i>	chocolate wattled bat	C	None	0	1	03/12/2014
943	Mammalia	Vespertilionidae	<i>Scoteanax rueppellii</i>	greater broad-nosed bat	C	None	1	4	24/05/1988
931	Mammalia	Vespertilionidae	<i>Scotorepens greyii</i>	little broad-nosed bat	C	None	0	1	04/01/1978
933	Mammalia	Vespertilionidae	<i>Scotorepens sp.</i>	None	None	None	0	1	04/01/1978
574	Reptilia	Agamidae	<i>Chlamydosaurus kingii</i>	frilled lizard	C	None	0	1	16/12/1993
567	Reptilia	Agamidae	<i>Diporiphora australis</i>	tommy roundhead	C	None	2	2	12/01/1979
561	Reptilia	Agamidae	<i>Diporiphora nobbi</i>	nobbi	C	None	3	4	17/11/2005
554	Reptilia	Agamidae	<i>Intellagama lesueurii</i>	eastern water dragon	C	None	0	4	03/12/2014
556	Reptilia	Agamidae	<i>Pogona barbata</i>	bearded dragon	C	None	0	3	21/03/2001
519	Reptilia	Boidae	<i>Morelia spilota</i>	carpet python	C	None	0	2	20/04/2014
30272	Reptilia	Chelidae	<i>Eelseya albagula</i>	southern snapping turtle	E	CE	0	6	03/04/1979
56	Reptilia	Chelidae	<i>Elusor macrurus</i>	Mary River turtle	E	E	0	4	01/11/2012
54	Reptilia	Chelidae	<i>Wollumbinia latisternum</i>	saw-shelled turtle	C	None	0	2	23/03/1979
508	Reptilia	Colubridae	<i>Tropidonophis mairii</i>	freshwater snake	C	None	2	5	03/12/2014
404	Reptilia	Diplodactylidae	<i>Amalosia rhombifer</i>	zig-zag gecko	C	None	0	1	04/01/1978
457	Reptilia	Elapidae	<i>Cryptophis nigrescens</i>	eastern small-eyed snake	C	None	0	1	20/03/1979

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
477	Reptilia	Elapidae	<i>Hemiaspis signata</i>	black-bellied swamp snake	C	None	4	6	20/03/1979
467	Reptilia	Elapidae	<i>Notechis scutatus</i>	eastern tiger snake	C	None	0	1	31/12/1972
470	Reptilia	Elapidae	<i>Oxyuranus scutellatus</i>	coastal taipan	C	None	1	2	05/10/1979
444	Reptilia	Elapidae	<i>Vermicella annulata</i>	bandy-bandy	C	None	0	1	04/11/2002
312	Reptilia	Scincidae	<i>Calyptotis scutirostrum</i>	scute-snouted calyptotis	C	None	1	5	15/12/1978
31898	Reptilia	Scincidae	<i>Cryptoblepharus pulcher pulcher</i>	elegant snake-eyed skink	C	None	0	3	05/04/1979
243	Reptilia	Scincidae	<i>Ctenotus taeniolatus</i>	copper-tailed skink	C	None	2	3	23/03/1979
184	Reptilia	Scincidae	<i>Lampropholis delicata</i>	dark-flecked garden sunskink	C	None	19	21	05/04/1979
83	Reptilia	Typhlopidae	<i>Anilius wiedii</i>	brown-snouted blind snake	C	None	0	1	24/02/1978
78	Reptilia	Varanidae	<i>Varanus gouldii</i>	sand monitor	C	None	0	1	28/02/2001
26926	Sarcopterygii	Ceratodontidae	<i>Neoceratodus forsteri</i>	Australian lungfish	None	V	0	7	30/03/2009

Table 3. Plants recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
8602	Charophyceae	Characeae	<i>Chara</i>	None	C	None	1	1	31/05/2001
16375	Equisetopsida	Acanthaceae	<i>Pseuderanthemum variabile</i>	pastel flower	C	None	1	3	03/05/2001
32728	Equisetopsida	Amaranthaceae	<i>Alternanthera denticulata</i> var. <i>denticulata</i>	None	C	None	1	1	31/05/2001
16720	Equisetopsida	Anacardiaceae	<i>Mangifera indica</i>	mango	None	None	0	1	21/05/1994
11769	Equisetopsida	Anacardiaceae	<i>Schinus terebinthifolius</i>	None	None	None	0	1	11/12/1997
8144	Equisetopsida	Annonaceae	<i>Melodorum leichhardtii</i>	None	C	None	2	3	27/11/1997
16434	Equisetopsida	Annonaceae	<i>Polyalthia nitidissima</i>	polyalthia	C	None	1	1	02/01/2005
15545	Equisetopsida	Apiaceae	<i>Centella asiatica</i>	None	C	None	0	1	27/11/1997
16703	Equisetopsida	Apiaceae	<i>Mackinlaya macrosciadea</i>	mackinlaya	C	None	0	2	02/12/1997
15152	Equisetopsida	Apiaceae	<i>Platysace linearifolia</i>	None	C	None	1	2	11/12/1997
19732	Equisetopsida	Apocynaceae	<i>Alyxia ruscifolia</i>	None	C	None	0	2	27/11/1997
8353	Equisetopsida	Apocynaceae	<i>Alyxia sharpei</i>	None	C	None	0	1	15/12/1997
9698	Equisetopsida	Apocynaceae	<i>Carissa ovata</i>	currantbush	C	None	0	2	11/12/1997
17050	Equisetopsida	Apocynaceae	<i>Gomphocarpus physocarpus</i>	balloon cottonbush	None	None	0	1	26/11/1997
11205	Equisetopsida	Apocynaceae	<i>Marsdenia coronata</i>	slender milkvine	V	None	1	1	10/04/1995
12361	Equisetopsida	Apocynaceae	<i>Melodinus australis</i>	southern melodinus	C	None	1	2	26/11/1997
11155	Equisetopsida	Apocynaceae	<i>Nerium oleander</i>	oleander	None	None	1	1	17/11/2000
16528	Equisetopsida	Apocynaceae	<i>Parsonsia</i>	None	C	None	0	1	27/11/1997

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
16526	Equisetopsida	Apocynaceae	<i>Parsonsia straminea</i>	monkey rope	C	None	0	3	11/12/1997
16059	Equisetopsida	Apocynaceae	<i>Tabernaemontana pandacaqui</i>	banana bush	C	None	0	5	27/11/1997
17952	Equisetopsida	Araliaceae	<i>Astrotricha longifolia</i>	star hair bush	C	None	2	2	24/10/1997
8462	Equisetopsida	Araliaceae	<i>Polyscias elegans</i>	celery wood	C	None	0	2	11/12/1997
18040	Equisetopsida	Araucariaceae	<i>Agathis robusta</i>	kauri pine	C	None	2	9	02/01/2005
14858	Equisetopsida	Arecaceae	<i>Archontophoenix cunninghamiana</i>	piccabeen palm	C	None	1	10	15/12/1997
12821	Equisetopsida	Arecaceae	<i>Calamus muelleri</i>	lawyer vine	C	None	0	3	10/12/1997
15226	Equisetopsida	Arecaceae	<i>Livistona</i>	None	C	None	0	1	09/12/1997
12776	Equisetopsida	Arecaceae	<i>Livistona australis</i>	cabbage tree palm	C	None	1	2	02/12/1997
17937	Equisetopsida	Aspleniaceae	<i>Asplenium australasicum</i>	None	C	None	0	1	09/12/1997
14051	Equisetopsida	Asteraceae	<i>Ageratum houstonianum</i>	blue billygoat weed	None	None	0	1	21/05/1994
15612	Equisetopsida	Asteraceae	<i>Baccharis halimifolia</i>	groundsel bush	None	None	0	5	11/12/1997
19371	Equisetopsida	Asteraceae	<i>Conyza</i>	None	None	None	0	1	21/05/1994
14676	Equisetopsida	Asteraceae	<i>Crassocephalum crepidioides</i>	thickhead	None	None	0	1	21/05/1994
8407	Equisetopsida	Asteraceae	<i>Praxelis clematidea</i>	None	None	None	2	2	04/02/2014
15129	Equisetopsida	Asteraceae	<i>Pterocaulon redolens</i>	None	C	None	1	1	21/02/1995
15103	Equisetopsida	Asteraceae	<i>Rutidosia murchisonii</i>	None	C	None	1	1	12/05/1990
12063	Equisetopsida	Blechnaceae	<i>Blechnum camfieldii</i>	None	C	None	1	1	31/12/1994
17818	Equisetopsida	Blechnaceae	<i>Blechnum nudum</i>	fishbone water fern	C	None	1	1	31/12/1994
14614	Equisetopsida	Blechnaceae	<i>Doodia caudata</i>	None	C	None	0	1	26/11/1997
11191	Equisetopsida	Boraginaceae	<i>Echium plantagineum</i>	Paterson's curse	None	None	1	1	11/12/1969
17594	Equisetopsida	Byttneriaceae	<i>Commersonia bartramia</i>	brown kurrajong	C	None	0	3	01/12/1997
12549	Equisetopsida	Byttneriaceae	<i>Seringia arborescens</i>	None	C	None	1	1	07/11/2000
13867	Equisetopsida	Campanulaceae	<i>Lobelia</i>	None	C	None	0	1	27/11/1997
17725	Equisetopsida	Capparaceae	<i>Capparis arborea</i>	brush caper berry	C	None	0	1	03/12/1997
18012	Equisetopsida	Casuarinaceae	<i>Allocasuarina littoralis</i>	None	C	None	2	17	19/08/2006
18014	Equisetopsida	Casuarinaceae	<i>Allocasuarina torulosa</i>	None	C	None	0	9	15/12/1997
9087	Equisetopsida	Casuarinaceae	<i>Casuarina cunninghamiana</i>	None	C	None	0	1	26/11/1997
14636	Equisetopsida	Celastraceae	<i>Denhamia celastroides</i>	broad-leaved boxwood	C	None	2	3	09/12/1997
16115	Equisetopsida	Chenopodiaceae	<i>Suaeda australis</i>	None	C	None	1	1	23/02/1999
17593	Equisetopsida	Commelinaceae	<i>Commelina</i>	None	C	None	0	2	27/11/1997

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10033	Equisetopsida	Commelinaceae	<i>Commelina diffusa</i>	wandering jew	C	None	1	1	03/05/2001
16599	Equisetopsida	Commelinaceae	<i>Murdannia graminea</i>	murdannia	C	None	0	1	11/12/1997
16399	Equisetopsida	Convolvulaceae	<i>Polymeria</i>	None	C	None	0	1	26/11/1997
14124	Equisetopsida	Cucurbitaceae	<i>Zehneria cunninghamii</i>	slender cucumber	C	None	1	1	01/06/2012
16377	Equisetopsida	Cunoniaceae	<i>Pseudoweinmannia lachnocarpa</i>	rose marara	C	None	1	1	02/01/2005
16207	Equisetopsida	Cunoniaceae	<i>Schizomeria ovata</i>	white cherry	C	None	1	1	26/07/1995
12065	Equisetopsida	Cupressaceae	<i>Callitris rhomboidea</i>	dune cypress pine	C	None	1	1	13/04/1995
14832	Equisetopsida	Cyperaceae	<i>Baumea muelleri</i>	None	C	None	1	1	20/11/1991
14833	Equisetopsida	Cyperaceae	<i>Baumea teretifolia</i>	None	C	None	1	1	24/07/1995
18197	Equisetopsida	Cyperaceae	<i>Caustis blakei</i> subsp. <i>blakei</i>	None	C	None	2	2	09/09/1997
17659	Equisetopsida	Cyperaceae	<i>Caustis recurvata</i>	None	C	None	3	5	11/12/1997
14754	Equisetopsida	Cyperaceae	<i>Chorizandra sphaerocephala</i>	None	C	None	1	1	24/07/1995
13965	Equisetopsida	Cyperaceae	<i>Cyperus bowmanni</i>	None	C	None	1	1	10/04/1995
17512	Equisetopsida	Cyperaceae	<i>Cyperus brevifolius</i>	Mullumbimby couch	None	None	1	1	31/05/2001
17515	Equisetopsida	Cyperaceae	<i>Cyperus difformis</i>	rice sedge	C	None	1	1	02/05/2001
17523	Equisetopsida	Cyperaceae	<i>Cyperus haspan</i> subsp. <i>haspan</i>	None	C	None	1	1	31/05/2001
17527	Equisetopsida	Cyperaceae	<i>Cyperus laevis</i>	None	C	None	2	2	31/05/2001
14664	Equisetopsida	Cyperaceae	<i>Cyperus lucidus</i>	None	C	None	2	2	27/11/1997
17474	Equisetopsida	Cyperaceae	<i>Cyperus pilosus</i>	None	C	None	1	1	02/05/2001
17475	Equisetopsida	Cyperaceae	<i>Cyperus polystachyos</i> var. <i>polystachyos</i>	None	C	None	2	2	31/05/2001
17479	Equisetopsida	Cyperaceae	<i>Cyperus sphaeroideus</i>	None	C	None	0	1	15/03/2015
17485	Equisetopsida	Cyperaceae	<i>Cyperus trinervis</i>	None	C	None	3	3	31/05/2001
17105	Equisetopsida	Cyperaceae	<i>Fimbristylis cinnamometorum</i>	None	C	None	1	1	10/01/2015
17107	Equisetopsida	Cyperaceae	<i>Fimbristylis dichotoma</i>	common fringe-rush	C	None	1	1	20/02/1995
17078	Equisetopsida	Cyperaceae	<i>Gahnia aspera</i>	None	C	None	0	2	26/11/1997
11977	Equisetopsida	Cyperaceae	<i>Isolepis cernua</i>	nodding club rush	C	None	3	3	03/05/2001
16870	Equisetopsida	Cyperaceae	<i>Isolepis inundata</i>	swamp club rush	C	None	2	2	31/05/2001
9381	Equisetopsida	Cyperaceae	<i>Lepidosperma laterale</i>	None	C	None	1	2	29/12/1999
16808	Equisetopsida	Cyperaceae	<i>Lepidosperma laterale</i> var. <i>laterale</i>	None	C	None	1	1	08/05/1995
16809	Equisetopsida	Cyperaceae	<i>Lepidosperma longitudinale</i>	pithy sword sedge	C	None	1	1	09/05/1995
16812	Equisetopsida	Cyperaceae	<i>Lepironia articulata</i>	None	C	None	2	2	03/05/2001
16295	Equisetopsida	Cyperaceae	<i>Rhynchospora rubra</i>	None	C	None	1	1	09/05/1995

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16211	Equisetopsida	Cyperaceae	<i>Schoenus apogon</i> var. <i>apogon</i>	None	C	None	1	1	24/07/1995
16894	Equisetopsida	Dennstaedtiaceae	<i>Hypolepis muelleri</i>	swamp bracken	C	None	1	1	31/12/1994
16340	Equisetopsida	Dennstaedtiaceae	<i>Peridium esculentum</i>	common bracken	C	None	0	8	15/12/1997
16950	Equisetopsida	Dilleniaceae	<i>Hibbertia</i>	None	C	None	0	1	15/12/1997
16941	Equisetopsida	Dilleniaceae	<i>Hibbertia linearis</i>	None	C	None	0	1	11/12/1997
14496	Equisetopsida	Dilleniaceae	<i>Hibbertia linearis</i> var. <i>floribunda</i>	None	C	None	1	1	22/09/1967
11555	Equisetopsida	Dilleniaceae	<i>Hibbertia vestita</i>	None	C	None	0	3	26/11/1997
17398	Equisetopsida	Ebenaceae	<i>Diospyros pentamera</i>	myrtle ebony	C	None	1	3	03/12/1997
17335	Equisetopsida	Elaeocarpaceae	<i>Elaeocarpus reticulatus</i>	ash quandong	C	None	1	2	11/12/1997
18111	Equisetopsida	Ericaceae	<i>Acrotriche aggregata</i>	red cluster heath	C	None	0	5	15/12/1997
30300	Equisetopsida	Ericaceae	<i>Agiortia pedicellata</i>	None	C	None	2	3	15/03/2015
17269	Equisetopsida	Ericaceae	<i>Epacris pulchella</i>	wallum heath	C	None	1	1	22/09/1967
16793	Equisetopsida	Ericaceae	<i>Leucopogon</i>	None	C	None	0	1	11/12/1997
16142	Equisetopsida	Ericaceae	<i>Sprengelia sprengelioides</i>	sprengelia	C	None	1	1	01/06/1999
17281	Equisetopsida	Eriocaulaceae	<i>Eriocaulon australe</i>	None	C	None	1	1	09/05/1995
14542	Equisetopsida	Eriocaulaceae	<i>Eriocaulon nanum</i>	None	C	None	1	1	09/05/1995
20126	Equisetopsida	Euphorbiaceae	<i>Alchornea</i>	None	None	None	0	1	10/12/1997
17561	Equisetopsida	Euphorbiaceae	<i>Croton insularis</i>	Queensland cascarilla	C	None	0	1	27/11/1997
16715	Equisetopsida	Euphorbiaceae	<i>Mallotus philippensis</i>	red kamala	C	None	0	1	27/11/1997
15834	Equisetopsida	Euphorbiaceae	<i>Ricinocarpus pinifolius</i>	wedding bush	C	None	0	1	11/12/1997
15663	Equisetopsida	Fabaceae	<i>Aeschynomene brevifolia</i>	None	C	None	1	1	07/03/1995
10913	Equisetopsida	Fabaceae	<i>Aeschynomene falcata</i>	None	None	None	1	1	17/11/2000
15683	Equisetopsida	Fabaceae	<i>Aotus lanigera</i>	pointed aotus	C	None	1	1	22/09/1967
15609	Equisetopsida	Fabaceae	<i>Austrostenisia blackii</i>	bloodvine	C	None	0	1	26/11/1997
15539	Equisetopsida	Fabaceae	<i>Castanospermum australe</i>	black bean	C	None	0	2	01/12/1997
15529	Equisetopsida	Fabaceae	<i>Chorizema parviflorum</i>	eastern flame pea	C	None	0	1	11/12/1997
15478	Equisetopsida	Fabaceae	<i>Crotalaria</i>	None	C	None	0	2	11/12/1997
14625	Equisetopsida	Fabaceae	<i>Daviesia filipes</i>	None	C	None	0	1	26/11/1997
15462	Equisetopsida	Fabaceae	<i>Desmodium</i>	None	C	None	0	1	11/12/1997
15457	Equisetopsida	Fabaceae	<i>Desmodium gunnii</i>	None	C	None	1	1	20/02/1995
20605	Equisetopsida	Fabaceae	<i>Dillwynia</i>	None	C	None	0	1	11/12/1997
13000	Equisetopsida	Fabaceae	<i>Flemingia parviflora</i>	flemingia	C	None	1	1	20/02/1995
15303	Equisetopsida	Fabaceae	<i>Gompholobium pinnatum</i>	poor mans gold	C	None	0	2	15/12/1997
15309	Equisetopsida	Fabaceae	<i>Hardenbergia violacea</i>	None	C	None	0	2	11/12/1997
15323	Equisetopsida	Fabaceae	<i>Hovea acutifolia</i>	None	C	None	0	2	11/12/1997

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25989	Equisetopsida	Fabaceae	<i>Hovea clavata</i>	None	C	None	1	1	10/05/1995
15260	Equisetopsida	Fabaceae	<i>Jacksonia scoparia</i>	None	C	None	0	5	15/12/1997
10859	Equisetopsida	Fabaceae	<i>Lotononis</i>	None	C	None	0	1	11/12/1997
15148	Equisetopsida	Fabaceae	<i>Phyllota phyllicoides</i>	yellow peabush	C	None	1	1	30/09/1989
15085	Equisetopsida	Fabaceae	<i>Pultenaea myrtoides</i>	None	C	None	1	1	21/07/1976
15092	Equisetopsida	Fabaceae	<i>Pultenaea villosa</i>	hairy bush pea	C	None	0	1	11/12/1997
17118	Equisetopsida	Flagellariaceae	<i>Flagellaria indica</i>	whip vine	C	None	0	5	01/12/1997
14008	Equisetopsida	Goodeniaceae	<i>Brunonia australis</i>	blue pincushion	C	None	0	1	26/11/1997
17065	Equisetopsida	Goodeniaceae	<i>Goodenia rotundifolia</i>	None	C	None	1	1	17/12/2015
16999	Equisetopsida	Haemodoraceae	<i>Haemodorum austroqueenslandicum</i>	None	C	None	1	1	17/12/2015
9218	Equisetopsida	Haloragaceae	<i>Myriophyllum gracile</i>	None	C	None	1	1	02/05/2001
10864	Equisetopsida	Haloragaceae	<i>Myriophyllum simulans</i>	None	C	None	1	1	03/04/1975
12249	Equisetopsida	Hemerocallidaceae	<i>Dianella</i>	None	C	None	0	2	15/12/1997
17464	Equisetopsida	Hemerocallidaceae	<i>Dianella caerulea</i>	None	C	None	0	3	27/11/1997
17463	Equisetopsida	Hemerocallidaceae	<i>Dianella caerulea</i> var. <i>vannata</i>	None	C	None	1	1	20/02/1995
15350	Equisetopsida	Hemerocallidaceae	<i>Geitonoplesium cymosum</i>	scrambling lily	C	None	0	3	26/11/1997
3021	Equisetopsida	Hydrocharitaceae	<i>Ottelia ovalifolia</i> subsp. <i>ovalifolia</i>	None	C	None	1	1	02/05/2001
9341	Equisetopsida	Johnsoniaceae	<i>Tricoryne anceps</i>	None	C	None	0	1	26/11/1997
15973	Equisetopsida	Johnsoniaceae	<i>Tricoryne anceps</i> subsp. <i>pteroaulon</i>	None	C	None	0	1	21/05/1994
15974	Equisetopsida	Johnsoniaceae	<i>Tricoryne elatior</i>	yellow autumn lily	C	None	1	1	07/11/2000
16844	Equisetopsida	Juncaceae	<i>Juncus continous</i>	None	C	None	1	1	02/05/2001
16846	Equisetopsida	Juncaceae	<i>Juncus usitatus</i>	None	C	None	1	1	31/05/2001
34798	Equisetopsida	Juncaginaceae	<i>Cycnogeton multifructus</i>	None	C	None	1	1	02/05/2001
15549	Equisetopsida	Lamiaceae	<i>Chloanthes parviflora</i>	None	C	None	1	1	20/11/1991
17628	Equisetopsida	Lamiaceae	<i>Clerodendrum floribundum</i>	None	C	None	0	1	10/12/1997
14321	Equisetopsida	Lamiaceae	<i>Plectranthus graveolens</i>	flea bush	C	None	1	1	21/02/1995
18814	Equisetopsida	Lamiaceae	<i>Vitex lignum-vitae</i>	None	C	None	0	1	09/12/1997
14122	Equisetopsida	Lamiaceae	<i>Westringia tenuicaulis</i>	tufted westringia	C	None	3	3	26/11/1997
17859	Equisetopsida	Lauraceae	<i>Beilschmiedia obtusifolia</i>	hard bolly gum	C	None	1	1	27/11/1997
11855	Equisetopsida	Lauraceae	<i>Cassytha</i>	None	C	None	0	1	11/12/1997
17703	Equisetopsida	Lauraceae	<i>Cassytha filiformis</i>	dodder laurel	C	None	2	2	08/05/1995
17705	Equisetopsida	Lauraceae	<i>Cassytha pubescens</i>	downy devil's twine	C	None	0	1	26/11/1997
11857	Equisetopsida	Lauraceae	<i>Cinnamomum baileyianum</i>	candlewood	C	None	2	2	26/11/1997

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17543	Equisetopsida	Lauraceae	<i>Cryptocarya</i>	None	C	None	0	1	26/11/1997
17578	Equisetopsida	Lauraceae	<i>Cryptocarya glaucescens</i>	None	C	None	1	3	27/11/1997
11866	Equisetopsida	Lauraceae	<i>Cryptocarya macdonaldii</i>	McDonald's laurel	C	None	2	2	27/11/1997
17541	Equisetopsida	Lauraceae	<i>Cryptocarya triplinervis</i>	None	C	None	0	8	15/12/1997
17303	Equisetopsida	Lauraceae	<i>Endiandra discolor</i>	domatia tree	C	None	1	2	26/11/1997
16619	Equisetopsida	Lauraceae	<i>Neolitsea dealbata</i>	white bolly gum	C	None	0	2	02/12/1997
14725	Equisetopsida	Laxmanniaceae	<i>Cordyline rubra</i>	red-fruited palm lily	C	None	0	1	27/11/1997
15339	Equisetopsida	Laxmanniaceae	<i>Eustrephus latifolius</i>	wombat berry	C	None	0	2	11/12/1997
12409	Equisetopsida	Laxmanniaceae	<i>Lomandra</i>	None	C	None	0	1	26/11/1997
14415	Equisetopsida	Laxmanniaceae	<i>Lomandra confertifolia subsp. pallida</i>	None	C	None	1	2	26/11/1997
16772	Equisetopsida	Laxmanniaceae	<i>Lomandra hystrix</i>	None	C	None	1	4	03/05/2001
16773	Equisetopsida	Laxmanniaceae	<i>Lomandra laxa</i>	broad-leaved matrush	C	None	1	1	20/02/1995
16776	Equisetopsida	Laxmanniaceae	<i>Lomandra longifolia</i>	None	C	None	1	8	03/05/2001
16133	Equisetopsida	Laxmanniaceae	<i>Sowerbaea juncea</i>	vanilla plant	C	None	1	2	11/12/1997
14456	Equisetopsida	Lindsaeaceae	<i>Lindsaea ensifolia subsp. ensifolia</i>	None	C	None	1	1	10/04/1995
7462	Equisetopsida	Loganiaceae	<i>Strychnos psilosperma</i>	strychnine tree	C	None	0	2	11/12/1997
14850	Equisetopsida	Loranthaceae	<i>Amyema conspicua subsp. conspicua</i>	None	C	None	2	2	26/11/1997
22198	Equisetopsida	Malvaceae	<i>Sida hackettiana subsp. (Gayndah P.Grimshaw+ PG2388)</i>	None	C	None	1	1	21/02/1995
26849	Equisetopsida	Melastomataceae	<i>Melastoma malabathricum subsp. malabathricum</i>	None	C	None	1	3	02/05/2001
14191	Equisetopsida	Meliaceae	<i>Synoum glandulosum subsp. glandulosum</i>	None	C	None	1	1	31/12/1994
16897	Equisetopsida	Menispermaceae	<i>Hypserpa decumbens</i>	None	C	None	1	1	26/07/1995
9647	Equisetopsida	Menispermaceae	<i>Stephania japonica</i>	None	C	None	0	2	26/11/1997
15998	Equisetopsida	Menispermaceae	<i>Tinospora smilacina</i>	snakevine	C	None	0	2	26/11/1997
15714	Equisetopsida	Mimosaceae	<i>Acacia</i>	None	C	None	0	3	03/12/1997
14929	Equisetopsida	Mimosaceae	<i>Acacia attenuata</i>	None	V	V	3	10	04/10/2010
15827	Equisetopsida	Mimosaceae	<i>Acacia aulacocarpa</i>	None	C	None	0	23	15/12/1997
11888	Equisetopsida	Mimosaceae	<i>Acacia bakeri</i>	marblewood	C	None	1	1	31/12/1994
15789	Equisetopsida	Mimosaceae	<i>Acacia complanata</i>	flatstem wattle	C	None	2	11	15/12/1997
15799	Equisetopsida	Mimosaceae	<i>Acacia falcata</i>	sickle wattle	C	None	0	1	27/11/1997
15746	Equisetopsida	Mimosaceae	<i>Acacia flavescens</i>	toothed wattle	C	None	0	4	11/12/1997

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14912	Equisetopsida	Mimosaceae	<i>Acacia hubbardiana</i>	None	C	None	0	1	11/12/1997
15765	Equisetopsida	Mimosaceae	<i>Acacia leiocalyx</i>	None	C	None	0	12	15/12/1997
14066	Equisetopsida	Mimosaceae	<i>Acacia leiocalyx</i> subsp. <i>leiocalyx</i>	None	C	None	1	1	08/06/1976
15772	Equisetopsida	Mimosaceae	<i>Acacia maidenii</i>	Maiden's wattle	C	None	0	3	11/12/1997
14894	Equisetopsida	Mimosaceae	<i>Acacia suaveolens</i>	sweet wattle	C	None	1	1	15/07/1987
15709	Equisetopsida	Mimosaceae	<i>Acacia ulicifolia</i>	None	C	None	1	2	11/12/1997
14131	Equisetopsida	Monimiaceae	<i>Wilkiea macrophylla</i>	large-leaved wilkiea	C	None	0	3	09/12/1997
17132	Equisetopsida	Moraceae	<i>Ficus coronata</i>	creek sandpaper fig	C	None	0	2	27/11/1997
17135	Equisetopsida	Moraceae	<i>Ficus fraseri</i>	white sandpaper fig	C	None	0	1	26/11/1997
9118	Equisetopsida	Moraceae	<i>Streblus brunonianus</i>	whalebone tree	C	None	0	1	27/11/1997
6402	Equisetopsida	Moraceae	<i>Trophis scandens</i> subsp. <i>scandens</i>	None	C	None	0	2	27/11/1997
17344	Equisetopsida	Myrsinaceae	<i>Embelia australiana</i>	embelia	C	None	0	1	27/11/1997
30309	Equisetopsida	Myrsinaceae	<i>Myrsine variabilis</i>	None	C	None	0	2	26/11/1997
17999	Equisetopsida	Myrtaceae	<i>Angophora leiocarpa</i>	rusty gum	C	None	0	10	15/12/1997
20255	Equisetopsida	Myrtaceae	<i>Backhousia</i>	None	C	None	0	1	26/11/1997
17883	Equisetopsida	Myrtaceae	<i>Backhousia myrtifolia</i>	carrol	C	None	2	2	27/11/1997
17888	Equisetopsida	Myrtaceae	<i>Baeckea frutescens</i>	None	C	None	0	2	11/12/1997
6531	Equisetopsida	Myrtaceae	<i>Corymbia citriodora</i>	spotted gum	C	None	0	1	21/05/1994
6444	Equisetopsida	Myrtaceae	<i>Corymbia gummifera</i>	red bloodwood	C	None	1	1	21/09/1974
6445	Equisetopsida	Myrtaceae	<i>Corymbia intermedia</i>	pink bloodwood	C	None	0	12	15/12/1997
18729	Equisetopsida	Myrtaceae	<i>Corymbia trachyphloia</i>	None	C	None	0	4	15/12/1997
17207	Equisetopsida	Myrtaceae	<i>Eucalyptus</i>	None	C	None	0	7	03/12/1997
17290	Equisetopsida	Myrtaceae	<i>Eucalyptus acmenoides</i>	None	C	None	2	4	15/12/1997
9447	Equisetopsida	Myrtaceae	<i>Eucalyptus acmenoides</i> x <i>Eucalyptus cloeziana</i>	None	C	None	3	3	14/08/1989
17243	Equisetopsida	Myrtaceae	<i>Eucalyptus bancroftii</i>	Bancroft's red gum	C	None	1	1	23/06/1990
17250	Equisetopsida	Myrtaceae	<i>Eucalyptus cloeziana</i>	Gympie messmate	C	None	1	1	14/08/1989
17252	Equisetopsida	Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved red ironbark	C	None	0	2	10/12/1997
17262	Equisetopsida	Myrtaceae	<i>Eucalyptus exserta</i>	Queensland peppermint	C	None	0	3	11/12/1997
19851	Equisetopsida	Myrtaceae	<i>Eucalyptus fibrosa</i>	None	C	None	1	5	15/12/1997
17265	Equisetopsida	Myrtaceae	<i>Eucalyptus grandis</i>	flooded gum	C	None	0	6	10/12/1997
18688	Equisetopsida	Myrtaceae	<i>Eucalyptus latisinensis</i>	None	C	None	3	10	15/03/2015
18687	Equisetopsida	Myrtaceae	<i>Eucalyptus portuensis</i>	None	C	None	1	1	09/05/1995
17189	Equisetopsida	Myrtaceae	<i>Eucalyptus propinqua</i>	small-fruited grey gum	C	None	0	2	03/12/1997
35824	Equisetopsida	Myrtaceae	<i>Eucalyptus racemosa</i>	None	C	None	1	1	26/03/1973

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6513	Equisetopsida	Myrtaceae	<i>Eucalyptus racemosa</i> <i>subsp. racemosa</i>	scribbly gum	C	None	1	12	15/12/1997
12465	Equisetopsida	Myrtaceae	<i>Eucalyptus siderophloia</i>	None	C	None	0	6	15/12/1997
17204	Equisetopsida	Myrtaceae	<i>Eucalyptus tereticornis</i>	None	C	None	0	9	15/12/1997
27383	Equisetopsida	Myrtaceae	<i>Gossia bidwillii</i>	None	C	None	0	3	11/12/1997
16919	Equisetopsida	Myrtaceae	<i>Homoranthus virgatus</i>	twiggy homoranthus	C	None	1	1	22/09/1967
16817	Equisetopsida	Myrtaceae	<i>Leptospermum brachyandrum</i>	weeping tea-tree	C	None	3	8	31/05/2001
14441	Equisetopsida	Myrtaceae	<i>Leptospermum polygalifolium</i>	tantoon	C	None	3	6	15/03/2015
16827	Equisetopsida	Myrtaceae	<i>Leptospermum trinervium</i>	woolly tea-tree	C	None	0	6	15/03/2015
16780	Equisetopsida	Myrtaceae	<i>Lophostemon confertus</i>	brush box	C	None	0	7	15/12/1997
16730	Equisetopsida	Myrtaceae	<i>Lophostemon suaveolens</i>	swamp box	C	None	1	17	15/12/1997
16684	Equisetopsida	Myrtaceae	<i>Melaleuca bracteata</i>	None	C	None	0	2	26/11/1997
14387	Equisetopsida	Myrtaceae	<i>Melaleuca cheelii</i>	None	NT	None	1	1	11/12/1997
18771	Equisetopsida	Myrtaceae	<i>Melaleuca linariifolia</i>	snow-in summer	C	None	0	1	11/12/1997
16694	Equisetopsida	Myrtaceae	<i>Melaleuca nodosa</i>	None	C	None	0	2	11/12/1997
31337	Equisetopsida	Myrtaceae	<i>Melaleuca pachyphylla</i>	None	C	None	1	3	07/11/2000
16695	Equisetopsida	Myrtaceae	<i>Melaleuca quinquenervia</i>	swamp paperbark	C	None	0	11	15/03/2015
31377	Equisetopsida	Myrtaceae	<i>Melaleuca salicina</i>	None	C	None	1	5	27/11/1997
14389	Equisetopsida	Myrtaceae	<i>Melaleuca sieberi</i>	None	C	None	2	32	18/12/1997
13424	Equisetopsida	Myrtaceae	<i>Melaleuca staphelioides</i>	None	C	None	0	3	11/12/1997
14391	Equisetopsida	Myrtaceae	<i>Melaleuca thymifolia</i>	thyme honeymyrtle	C	None	0	2	15/03/2015
16700	Equisetopsida	Myrtaceae	<i>Melaleuca uncinata</i>	None	C	None	1	1	22/09/1967
16656	Equisetopsida	Myrtaceae	<i>Melaleuca viridiflora</i> var. <i>viridiflora</i>	None	C	None	2	2	11/08/1996
16481	Equisetopsida	Myrtaceae	<i>Ptilidostigma rhytispermum</i>	None	C	None	2	3	27/11/1997
13406	Equisetopsida	Myrtaceae	<i>Rhodamnia dumicola</i>	rib-fruited malletwood	C	None	1	2	02/12/1997
16290	Equisetopsida	Myrtaceae	<i>Rhodomyrtus psidioides</i>	native guava	C	None	1	3	27/11/1997
31853	Equisetopsida	Myrtaceae	<i>Sannantha bidwillii</i>	None	C	None	1	1	26/11/1997
16078	Equisetopsida	Myrtaceae	<i>Syzygium australe</i>	scrub cherry	C	None	3	4	27/11/1997
15980	Equisetopsida	Myrtaceae	<i>Tristaniopsis laurina</i>	None	C	None	1	6	09/12/1997
15857	Equisetopsida	Myrtaceae	<i>Waterhousea floribunda</i>	weeping lilly pilly	C	None	2	13	10/12/1997
13439	Equisetopsida	Oleaceae	<i>Notelaea longifolia</i>	None	C	None	1	3	10/12/1997
14087	Equisetopsida	Orchidaceae	<i>Acianthus fornicatus</i>	pixie caps	C	None	1	1	26/05/1995
15816	Equisetopsida	Orchidaceae	<i>Arthrochilus irritabilis</i>	leafy elbow orchid	C	None	0	1	24/08/1995
13444	Equisetopsida	Orchidaceae	<i>Caladenia carnea</i>	None	C	None	3	4	08/09/1996
14023	Equisetopsida	Orchidaceae	<i>Caleana major</i>	flying duck orchid	C	None	1	2	30/08/1995
27531	Equisetopsida	Orchidaceae	<i>Corunastylis acuminata</i>	None	C	None	1	3	23/07/1996

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
27542	Equisetopsida	Orchidaceae	<i>Corunastylis pumila</i>	None	C	None	0	1	24/08/1995
27544	Equisetopsida	Orchidaceae	<i>Corunastylis sagittifera</i>	None	C	None	0	2	23/07/1996
12827	Equisetopsida	Orchidaceae	<i>Corybas</i>	None	C	None	0	1	24/08/1995
14727	Equisetopsida	Orchidaceae	<i>Corybas aconitiflorus</i>	None	C	None	1	1	08/06/1998
13327	Equisetopsida	Orchidaceae	<i>Corybas undulatus</i>	tailed helmet orchid	C	None	1	1	26/05/1995
13278	Equisetopsida	Orchidaceae	<i>Cryptostylis subulata</i>	large toungue orchid	C	None	1	1	15/10/1995
17505	Equisetopsida	Orchidaceae	<i>Cymbidium canaliculatum</i>	None	C	None	0	1	26/11/1997
9275	Equisetopsida	Orchidaceae	<i>Dipodium variegatum</i>	None	C	None	1	2	24/08/1995
9062	Equisetopsida	Orchidaceae	<i>Diuris alba</i>	None	C	None	1	2	11/08/1996
9276	Equisetopsida	Orchidaceae	<i>Diuris chrysantha</i>	double yellow tails	C	None	0	1	24/08/1995
12802	Equisetopsida	Orchidaceae	<i>Eriochilus</i>	None	C	None	1	1	25/05/1998
13952	Equisetopsida	Orchidaceae	<i>Eriochilus cucullatus</i>	None	C	None	1	2	23/07/1996
13203	Equisetopsida	Orchidaceae	<i>Glossodia minor</i>	small wax lip orchid	C	None	1	2	30/08/1995
12782	Equisetopsida	Orchidaceae	<i>Lyperanthus suaveolens</i>	brown beaks	C	None	1	1	30/08/1995
16629	Equisetopsida	Orchidaceae	<i>Microtis parviflora</i>	slender onion orchid	C	None	2	2	04/09/1995
12790	Equisetopsida	Orchidaceae	<i>Orthoceras strictum</i>	horned orchid	C	None	0	1	23/07/1996
12734	Equisetopsida	Orchidaceae	<i>Plectorrhiza brevibrabis</i>	None	C	None	1	1	02/01/2005
16367	Equisetopsida	Orchidaceae	<i>Prasophyllum elatum</i>	tall leek orchid	C	None	0	1	23/07/1996
36226	Equisetopsida	Orchidaceae	<i>Pterostylis antennifera</i>	None	C	None	1	1	05/05/1998
6221	Equisetopsida	Orchidaceae	<i>Pterostylis chaetophora</i>	None	E	None	1	1	30/08/1995
9834	Equisetopsida	Orchidaceae	<i>Pterostylis russellii</i>	None	C	None	1	1	13/04/1999
7915	Equisetopsida	Orchidaceae	<i>Thelymitra angustifolia</i>	None	C	None	1	1	02/09/1995
13081	Equisetopsida	Orchidaceae	<i>Thelymitra nuda</i>	scented sun orchid	C	None	0	1	24/08/1995
12675	Equisetopsida	Orchidaceae	<i>Thelymitra pauciflora</i>	slender sun orchid	C	None	0	1	23/07/1996
16000	Equisetopsida	Osmundaceae	<i>Todea barbara</i>	king fern	C	None	1	1	31/12/1994
15840	Equisetopsida	Pandanaceae	<i>Freycinetia scandens</i>	None	C	None	1	2	26/11/1997
16532	Equisetopsida	Passifloraceae	<i>Passiflora suberosa</i>	corky passion flower	None	None	0	1	26/11/1997
16463	Equisetopsida	Philydraceae	<i>Philydrum lanuginosum</i>	frogsmouth	C	None	0	3	11/12/1997
18113	Equisetopsida	Phyllanthaceae	<i>Actephila lindleyi</i>	actephila	C	None	1	1	02/01/2005
17808	Equisetopsida	Phyllanthaceae	<i>Breynia oblongifolia</i>	None	C	None	0	8	15/12/1997
17810	Equisetopsida	Phyllanthaceae	<i>Bridelia leichhardtii</i>	None	C	None	0	1	11/12/1997
14706	Equisetopsida	Phyllanthaceae	<i>Cleistanthus cunninghamii</i>	omega	C	None	1	1	02/01/2005
9378	Equisetopsida	Phyllanthaceae	<i>Glochidion ferdinandi</i>	None	C	None	0	12	15/12/1997
16474	Equisetopsida	Phyllanthaceae	<i>Phyllanthus</i>	None	C	None	0	2	27/11/1997

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
18266	Equisetopsida	Phyllanthaceae	<i>Phyllanthus microcladus</i>	None	C	None	4	5	28/11/2006
11292	Equisetopsida	Phyllanthaceae	<i>Sauropus hirtellus</i>	None	C	None	1	1	20/02/1995
16505	Equisetopsida	Picrodendraceae	<i>Petalostigma pubescens</i>	quinine tree	C	None	0	5	11/12/1997
14301	Equisetopsida	Picrodendraceae	<i>Petalostigma triloculare</i>	forest quinine	C	None	1	1	12/05/1990
15866	Equisetopsida	Pinaceae	<i>Pinus</i>	None	C	None	0	3	15/12/1997
12030	Equisetopsida	Pinaceae	<i>Pinus elliotii</i>	slash pine	None	None	0	2	13/08/2017
13256	Equisetopsida	Pittosporaceae	<i>Billardiera scandens</i>	None	C	None	1	1	23/06/1990
16459	Equisetopsida	Pittosporaceae	<i>Pittosporum revolutum</i>	yellow pittosporum	C	None	1	5	27/11/1997
22387	Equisetopsida	Pittosporaceae	<i>Pittosporum spinescens</i>	None	C	None	0	1	21/05/1994
15954	Equisetopsida	Plantaginaceae	<i>Veronica plebeia</i>	trailing speedwell	C	None	1	1	23/06/1990
15670	Equisetopsida	Poaceae	<i>Alloteropsis semialata</i>	cockatoo grass	C	None	0	1	27/11/1997
15676	Equisetopsida	Poaceae	<i>Andropogon virginicus</i>	whiskey grass	None	None	2	2	24/06/2008
14811	Equisetopsida	Poaceae	<i>Aristida</i>	None	C	None	0	2	27/11/1997
11121	Equisetopsida	Poaceae	<i>Aristida gracilipes</i>	None	C	None	1	1	21/02/1995
11123	Equisetopsida	Poaceae	<i>Aristida queenslandica</i> var. <i>queenslandica</i>	None	C	None	1	1	11/05/1995
15658	Equisetopsida	Poaceae	<i>Aristida vagans</i>	None	C	None	1	1	20/02/1995
11127	Equisetopsida	Poaceae	<i>Aristida warburgii</i>	None	C	None	1	1	31/03/1995
10316	Equisetopsida	Poaceae	<i>Bothriochloa decipiens</i> var. <i>decipiens</i>	None	C	None	1	1	20/02/1995
15485	Equisetopsida	Poaceae	<i>Cymbopogon refractus</i>	barbed-wire grass	C	None	0	2	15/12/1997
32006	Equisetopsida	Poaceae	<i>Dichelachne montana</i>	None	C	None	1	1	20/02/1995
18913	Equisetopsida	Poaceae	<i>Digitaria eriantha</i>	None	None	None	0	1	10/12/1997
15426	Equisetopsida	Poaceae	<i>Digitaria parviflora</i>	None	C	None	0	1	21/05/1994
15427	Equisetopsida	Poaceae	<i>Digitaria ramularis</i>	None	C	None	1	1	20/02/1995
15411	Equisetopsida	Poaceae	<i>Entolasia stricta</i>	wiry panic	C	None	2	2	03/05/2001
11081	Equisetopsida	Poaceae	<i>Eriachne rara</i>	None	C	None	0	1	15/03/2015
15290	Equisetopsida	Poaceae	<i>Imperata cylindrica</i>	blady grass	C	None	0	12	15/12/1997
9154	Equisetopsida	Poaceae	<i>Melinis repens</i>	red natal grass	None	None	0	1	21/05/1994
21182	Equisetopsida	Poaceae	<i>Oplismenus</i>	None	None	None	0	2	27/11/1997
15163	Equisetopsida	Poaceae	<i>Oplismenus aemulus</i>	creeping shade grass	C	None	0	1	21/05/1994
10638	Equisetopsida	Poaceae	<i>Ottochloa nodosa</i>	None	C	None	0	1	21/05/1994
13607	Equisetopsida	Poaceae	<i>Panicum effusum</i>	None	C	None	1	1	21/02/1995
18424	Equisetopsida	Poaceae	<i>Panicum simile</i>	None	C	None	1	1	21/02/1995
12587	Equisetopsida	Poaceae	<i>Paspalidium</i>	None	C	None	0	1	26/11/1997
15135	Equisetopsida	Poaceae	<i>Paspalum paniculatum</i>	Russell River grass	None	None	1	1	10/04/1995

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
27800	Equisetopsida	Poaceae	<i>Sarga leiocladum</i>	None	C	None	2	2	21/02/1995
10158	Equisetopsida	Poaceae	<i>Sporobolus natalensis</i>	None	None	None	1	1	05/10/1993
14974	Equisetopsida	Poaceae	<i>Themeda triandra</i>	kangaroo grass	C	None	0	10	15/03/2015
33922	Equisetopsida	Polygalaceae	<i>Polygala triflora</i>	None	C	None	1	1	21/02/1995
16495	Equisetopsida	Polygonaceae	<i>Persicaria hydropiper</i>	water pepper	C	None	2	2	27/11/1997
14352	Equisetopsida	Polygonaceae	<i>Persicaria strigosa</i>	None	C	None	1	1	31/05/2001
13159	Equisetopsida	Polygonaceae	<i>Persicaria subsessilis</i>	hairy knotweed	C	None	1	1	31/05/2001
16627	Equisetopsida	Polypodiaceae	<i>Microsorium scandens</i>	fragrant climbing fern	C	None	1	1	31/12/1994
11696	Equisetopsida	Polypodiaceae	<i>Platyterium bifurcatum</i>	None	C	None	0	1	27/11/1997
14828	Equisetopsida	Proteaceae	<i>Banksia aemula</i>	wallum banksia	C	None	0	1	11/12/1997
9294	Equisetopsida	Proteaceae	<i>Banksia integrifolia</i>	None	C	None	0	11	15/12/1997
17897	Equisetopsida	Proteaceae	<i>Banksia oblongifolia</i>	dwarf banksia	C	None	0	2	11/12/1997
17898	Equisetopsida	Proteaceae	<i>Banksia robur</i>	broad-leaved banksia	C	None	1	5	11/12/1997
14721	Equisetopsida	Proteaceae	<i>Conospermum taxifolium</i>	devil's rice	C	None	3	3	19/10/2002
17025	Equisetopsida	Proteaceae	<i>Grevillea banksii</i>	None	C	None	0	1	11/12/1997
22404	Equisetopsida	Proteaceae	<i>Grevillea reptans</i>	None	C	None	3	3	29/05/2019
5873	Equisetopsida	Proteaceae	<i>Hakea actites</i>	None	C	None	2	4	15/03/2015
35803	Equisetopsida	Proteaceae	<i>Hakea benthamii</i>	None	C	None	2	2	26/11/1997
14537	Equisetopsida	Proteaceae	<i>Hakea florulenta</i>	three-nerved willow hakea	C	None	1	2	11/12/1997
13185	Equisetopsida	Proteaceae	<i>Lomatia</i>	None	C	None	0	1	11/12/1997
13183	Equisetopsida	Proteaceae	<i>Lomatia silaifolia</i>	crinkle bush	C	None	0	2	11/12/1997
16497	Equisetopsida	Proteaceae	<i>Persoonia cornifolia</i>	broad-leaved geebung	C	None	0	2	10/12/1997
13163	Equisetopsida	Proteaceae	<i>Persoonia tenuifolia</i>	None	C	None	0	1	26/11/1997
16501	Equisetopsida	Proteaceae	<i>Persoonia virgata</i>	small-leaved geebung	C	None	4	9	15/03/2015
16507	Equisetopsida	Proteaceae	<i>Petrophile shirleyae</i>	None	C	None	1	3	15/03/2015
14177	Equisetopsida	Proteaceae	<i>Strangea linearis</i>	strangea	C	None	0	1	26/11/1997
31417	Equisetopsida	Proteaceae	<i>Xylomelum benthamii</i>	None	C	None	0	2	02/12/1997
14887	Equisetopsida	Pteridaceae	<i>Adiantum silvaticum</i>	None	C	None	1	1	31/12/1994
11100	Equisetopsida	Pteridaceae	<i>Cheilanthes tenuifolia</i>	rock fern	C	None	1	1	10/04/1995
21911	Equisetopsida	Restionaceae	<i>Sporadanthus caudatus</i>	None	C	None	1	1	24/07/1995
9659	Equisetopsida	Rhamnaceae	<i>Alphitonia excelsa</i>	soap tree	C	None	0	18	15/12/1997
19409	Equisetopsida	Rosaceae	<i>Rubus</i>	None	C	None	0	1	26/11/1997
22152	Equisetopsida	Rubiaceae	<i>Atractocarpus chartaceus</i>	None	C	None	1	1	31/12/1994
12298	Equisetopsida	Rubiaceae	<i>Coelospermum paniculatum</i> var. <i>paniculatum</i>	None	C	None	1	1	27/11/1997
27436	Equisetopsida	Rubiaceae	<i>Cyclophyllum coprosmoides</i>	None	C	None	0	1	11/12/1997
34588	Equisetopsida	Rubiaceae	<i>Gynochthodes jasminoides</i>	None	C	None	0	3	26/11/1997
16543	Equisetopsida	Rubiaceae	<i>Opercularia diphylla</i>	None	C	None	1	1	07/01/1990

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
7598	Equisetopsida	Rubiaceae	<i>Pavetta australiensis</i>	None	C	None	0	1	26/11/1997
16334	Equisetopsida	Rubiaceae	<i>Psychotria daphnoides</i>	None	C	None	0	1	26/11/1997
16333	Equisetopsida	Rubiaceae	<i>Psychotria daphnoides</i> var. <i>daphnoides</i>	None	C	None	1	1	10/04/1995
14293	Equisetopsida	Rubiaceae	<i>Psychotria loniceroides</i>	hairy psychotria	C	None	1	3	26/11/1997
2399	Equisetopsida	Rubiaceae	<i>Psydrax odorata</i>	None	C	None	0	1	11/12/1997
15870	Equisetopsida	Rutaceae	<i>Acronychia imperforata</i>	beach acronychia	C	None	0	1	21/05/1994
13739	Equisetopsida	Rutaceae	<i>Acronychia oblongifolia</i>	common acronychia	C	None	1	2	03/12/1997
17833	Equisetopsida	Rutaceae	<i>Boronia falcifolia</i>	wallum boronia	C	None	1	1	22/09/1967
17842	Equisetopsida	Rutaceae	<i>Boronia rivularis</i>	Wide Bay boronia	NT	None	2	2	04/10/2010
17843	Equisetopsida	Rutaceae	<i>Boronia rosmarinifolia</i>	forest boronia	C	None	1	1	30/09/1989
17015	Equisetopsida	Rutaceae	<i>Halfordia kendack</i>	saffron heart	C	None	1	1	26/07/1995
30527	Equisetopsida	Rutaceae	<i>Philotheca queenslandica</i>	None	C	None	1	1	22/09/1967
14128	Equisetopsida	Rutaceae	<i>Zieria minutiflora</i>	None	C	None	0	1	21/05/1994
17930	Equisetopsida	Sapindaceae	<i>Arytera divaricata</i>	coogera	C	None	0	2	03/12/1997
17548	Equisetopsida	Sapindaceae	<i>Cupaniopsis anacardioides</i>	tuckeroo	C	None	1	1	27/11/1997
13686	Equisetopsida	Sapindaceae	<i>Cupaniopsis parvifolia</i>	small-leaved tuckeroo	C	None	0	2	10/12/1997
17384	Equisetopsida	Sapindaceae	<i>Dodonaea triquetra</i>	large-leaved hop bush	C	None	1	3	23/02/1999
16998	Equisetopsida	Sapindaceae	<i>Guioa semiglauca</i>	guioa	C	None	1	3	10/12/1997
16885	Equisetopsida	Sapindaceae	<i>Jagera pseudorhus</i>	None	C	None	0	4	11/12/1997
14355	Equisetopsida	Sapindaceae	<i>Mischocarpus pyriformis</i>	None	C	None	0	1	27/11/1997
16205	Equisetopsida	Schizaeaceae	<i>Schizaea bifida</i>	forked comb fern	C	None	0	1	26/11/1997
33391	Equisetopsida	Simaroubaceae	<i>Samadera bidwillii</i>	None	V	V	4	27	15/12/1997
15881	Equisetopsida	Smilacaceae	<i>Smilax australis</i>	barbed-wire vine	C	None	0	3	27/11/1997
15882	Equisetopsida	Smilacaceae	<i>Smilax glyciophylla</i>	sweet sarsaparilla	C	None	0	1	21/05/1994
16129	Equisetopsida	Solanaceae	<i>Solanum</i>	None	C	None	0	1	27/11/1997
16157	Equisetopsida	Solanaceae	<i>Solanum americanum</i>	None	C	None	0	1	21/05/1994
16124	Equisetopsida	Solanaceae	<i>Solanum stelligerum</i>	devil's needles	C	None	1	1	02/01/2005
21882	Equisetopsida	Stylidiaceae	<i>Stylidium diffusum</i>	None	C	None	1	1	14/04/2018
16113	Equisetopsida	Stylidiaceae	<i>Stylidium graminifolium</i>	grassy-leaved trigger-flower	C	None	1	1	05/01/1992
13753	Equisetopsida	Symplocaceae	<i>Symplocos thwaitesii</i>	buff hazelwood	C	None	1	1	31/12/1994
16439	Equisetopsida	Thymelaeaceae	<i>Pimelea linifolia</i>	None	C	None	0	3	11/12/1997
15926	Equisetopsida	Thymelaeaceae	<i>Wikstroemia indica</i>	tie bush	C	None	0	1	27/11/1997

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
17955	Equisetopsida	Ulmaceae	<i>Aphananthe philippinensis</i>	None	C	None	0	1	09/12/1997
16011	Equisetopsida	Ulmaceae	<i>Trema tomentosa</i>	None	C	None	0	3	11/12/1997
19905	Equisetopsida	Verbenaceae	<i>Lantana camara</i>	lantana	None	None	0	6	15/12/1997
36152	Equisetopsida	Violaceae	<i>Afrohybanthus stellarioides</i>	None	C	None	0	1	11/12/1997
18917	Equisetopsida	Violaceae	<i>Viola hederacea</i>	None	C	None	1	2	31/05/2001
14704	Equisetopsida	Vitaceae	<i>Cissus antarctica</i>	None	C	None	0	1	15/12/1997
17647	Equisetopsida	Vitaceae	<i>Cissus hypoglauca</i>	None	C	None	0	1	21/05/1994
31727	Equisetopsida	Vitaceae	<i>Clematicissus opaca</i>	None	C	None	0	1	26/11/1997
31266	Equisetopsida	Vitaceae	<i>Parthenocissus tricuspidata</i>	None	None	None	1	1	25/07/1996
14142	Equisetopsida	Winteraceae	<i>Tasmannia insipida</i>	brush pepperbush	C	None	1	1	31/12/1994
15935	Equisetopsida	Xanthorrhoeaceae	<i>Xanthorrhoea</i>	None	C	None	0	2	26/11/1997
15934	Equisetopsida	Xanthorrhoeaceae	<i>Xanthorrhoea johnsonii</i>	None	C	None	0	10	15/12/1997
9156	Equisetopsida	Xanthorrhoeaceae	<i>Xanthorrhoea latifolia</i> subsp. <i>latifolia</i>	None	C	None	0	2	26/11/1997
15896	Equisetopsida	Xyridaceae	<i>Xyris complanata</i>	yellow-eye	C	None	1	2	27/11/1997
15897	Equisetopsida	Xyridaceae	<i>Xyris juncea</i>	dwarf yellow-eye	C	None	1	1	12/06/1992
16708	Equisetopsida	Zamiaceae	<i>Macrozamia pauli-guilielmi</i>	None	E	E	17	63	04/10/2010
18019	Equisetopsida	Zingiberaceae	<i>Alpinia arundelliana</i>	None	C	None	1	1	31/12/1994
14844	Equisetopsida	Zingiberaceae	<i>Alpinia caerulea</i>	wild ginger	C	None	1	1	31/12/1994

Table 4. Fungi recorded within the area of interest and its one kilometre buffer

Taxon Id	Class	Family	Scientific Name	Common Name	NCA	EPBC	Specimens	Records	Last record
25637	Agaricomycetes	Agaricaceae	<i>Chlorophyllum molybdites</i>	green-spored parasol	C	None	1	1	09/05/1997
25876	Agaricomycetes	Agaricaceae	<i>Lycoperdon</i>	None	C	None	1	1	09/05/1997

Table 5. Protists recorded within the area of interest and its one kilometre buffer

No species found within the area of interest and its one kilometre buffer.

Species table headings and codes

Taxon Id: Unique identifier of the taxon from the WildNet database.

NCA: Queensland conservation status of the taxon under the *Nature Conservation Act 1992* (Endangered (E), Extinct in the Wild (PE), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern(C)).

EPBC: Australian conservation status of the taxon under the *Environment Protection and Biodiversity Conservation Act 1999* (Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V)).

Specimens: The number of specimen-backed records of the taxon.

Records: The total number of records of the taxon.

Last record: Date of latest record of the taxon.

Links and Support

Other sites that deliver species information from the WildNet database include:
Department of Environment and Science

- [Species profile search](#) - access species information approved for publication including species names, statuses, notes, images, distribution maps and records
- [Species lists](#) - generate species lists for Queensland protected areas, forestry areas, local governments and areas defined using coordinates
- [Biomaps](#) - view biodiversity information, including species information approved for publication, and generate reports
- [Qld wildlife data API](#) - access species information approved for publication such as notes, images and records etc.
- [WetlandMaps](#) - view species records, survey locations etc. approved for publication
- [WetlandSummary](#) - view wildlife statistics, species lists for a range of area types, and access species profiles
- [Generalised distribution and densities of Queensland wildlife](#) - Queensland species distributions and densities generalised to a 10 km grid resolution
- [Conservation status of Queensland wildlife](#) - access current lists of priority species for Queensland including nomenclature and status information
- [Queensland Confidential Species](#) - the list of species flagged as confidential in the WildNet database.

Other useful sites for accessing biodiversity data include:

- [Queensland Government Data](#)
- [Atlas of Living Australia](#)
- [OZCAM - Online Zoological Collections of Australian Museums](#)
- [AVH - Australia's Virtual Herbarium](#)
- [Protected Matters Search Tool](#)

Please direct queries about this report to the [WildNet Team](#).

Disclaimer

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GRC Priority species, 2019

Column 1 Identified priority species (fauna)	Column 2 Identified priority species (flora)
Brush-tailed Phascogale (<i>Phascogale tapoatafa</i>)	Australian Teak (<i>Flindersia australis</i>)
Eastern Yellow Robin (<i>Eopsaltria australis</i>)	Blue Gum (<i>Eucalyptus tereticornis</i>)
Feathertail Glider (<i>Acrobates pygmaeus</i>)	Blue Quandong (<i>Elaeocarpus grandis</i>)
Great Barred Frog (<i>Mixophyes fasciolatus</i>)	Broad-leafed Paperbark (<i>Melaleuca quinquenervia</i>)
Koala (<i>Phascolarctos cinereus</i>)	Cabbage Tree Palm (<i>Livistona australis</i>)
Mary River Cod (<i>Maccullochella mariensis</i>)	Gympie Messmate (<i>Eucalyptus cloeziana</i>)
Noisy Pitta (<i>Pitta versicolor</i>)	Gympie Nut (<i>Macadamia ternifolia</i> and <i>Macadamia integrifolia</i>)
Ornate Rainbowfish (<i>Rhadinocentrus ornatus</i>)	Hoop Pine (<i>Araucaria cunninghamii</i>)
Platypus (<i>Ornithorhynchus anatinus</i>)	Kauri (<i>Agathis robusta</i>)
Sugar Glider (<i>Petaurus breviceps</i>)	Rusty Tulip Oak, Copper Booyong (<i>Argyrodendron</i> sp. Kin Kin)
Topknot Pigeon (<i>Lophoaimus antarcticus</i>)	Swamp Grasstree (<i>Xanthorrhoea fulva</i>)
Wompoo fruit dove (<i>Ptilinopus magnificus</i>)	Wallum Sun Orchid (<i>Thelmitra purpurata</i>)

